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MEMOIRS

OF

MARSHALL HALL,

M.D., F.R.S.,

CORRESPONDING MEMBER OF THE INSTITUTE OF FRANCE;
FOREIGN ASSOCIATE OF THE ACADEMY OF MEDICINE OF PARIS;
ETC. ETC.

BY HIS WIDOW.



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1861.

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Very truly yours
Jeannette Bush

LONDON:
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COVENT GARDEN.

TO MY SON AND HIS WIFE

AND

TO MY GRANDCHILDREN,

I DEDICATE

THIS SKETCH OF THE BEST OF PARENTS:

WOULD THAT IT WERE MORE WORTHY OF THE

BELOVED AND HONOURED ORIGINAL!

CHARLOTTE HALL.

PREFACE.

It is with great diffidence that I appear before the public as the biographer of one so distinguished in science as Dr. Marshall Hall. That I should have presumed to undertake so important an office requires, indeed, some explanation. Ever since his deeply lamented death, I have earnestly desired that some record of his personal character should exist. His medical works and scientific discoveries are already before the world, and may safely be left to stand or fall according to their intrinsic value; but his personal character, if not described by a contemporary well acquainted with the original, could neither be faithfully delineated, nor rescued from misconception, and from the obliteration which inevitably waits on the footsteps of Time.

I long entertained the hope that this task might be executed by some one far more competent than myself. No one, however, who has not experienced it, can fully estimate the great difficulty of finding a biographer who, *with sufficient leisure* for the undertaking, combines all the requisite knowledge of the individual—of his personal character, his history, and

his scientific labours, especially when these last are of no ordinary kind. Once, indeed, I flattered myself that I had secured the assistance of an able physiologist; but the event proved otherwise. The plan contemplated by this gentleman would have rendered the work highly valuable in a scientific point of view; but most of my advisers thought that its learned character and proposed extent would tend greatly to limit the number of its readers; thus, not without much regret, I relinquished the hope of his valuable aid. I trust that a more elaborate account of my husband's investigations may yet be written at some future time, being perhaps prefixed to his collected works.

Finally, many, upon whose judgment I place the greatest reliance, strongly urged me to undertake the task myself, trusting to procure the assistance of some medical friends in the professional portions of the work. Some valuable additions of this nature will be found in an Appendix, which contains, besides other matter, an able account of my husband's discoveries in the Nervous System, by Dr. W. Tyler Smith, who, from daily conversations with him on this subject for many years, obtained an accurate knowledge of it.

For a brief account of the mode of resuscitation, generally known by the name of "The Marshall Hall Method," I am indebted to my husband's young friend, Mr. Charles Hunter, of Wilton Place, Belgrave Square, who so ably assisted in the experiments which proved the efficacy of that mode of treatment, and who is practically and thoroughly acquainted with the whole subject.

I would gladly have procured assistance in giving an account of the other works of my husband; but medical friends have assured me, that the many quotations which I have made from the best authorities explain their nature as fully as the limits of this Volume allow. In particular, I wish to acknowledge the assistance I have derived from a brief but able memoir of my husband, written by his valued friend Dr. Webster, of Dulwich, which appeared in the *Lancet* of July 27th, 1850, when the Editor of that journal conceived the happy idea of gathering together a series of short biographies of living eminent members of the medical profession. An invaluable communication from the same friend will be found in the latter part of this Volume. I have also made quotations from the admirable obituary notice which appeared in the *Lancet* for August 15th, 1857, and which, even in our grief, afforded heartfelt gratification to myself and family.

Some important paragraphs are also extracted from the obituary notice in the *Medical Times and Gazette*, and that of the *Edinburgh New Philosophical Journal* for 1858. To a host of kind friends, whose valuable letters enrich this Volume, I tender my most grateful thanks. The abstract of my husband's little work on "The Twofold Slavery of the United States," and his "Plan for the Sewerage of London," have been prepared by my son, who has also afforded me the greatest assistance in carrying these pages through the press.

Even after having prepared the greater part of this biographical sketch, so painfully did I doubt its fitness to appear in print, that I proposed that what I had

written should pass through editorial hands. To this a friend replied—"In my opinion it would injure the proposed biography to place it in the hands of any professional writer or author, with a view to having it dressed up. It would thus lose more in freshness and interest than it would gain in the way of polish." So strongly did my own inability press upon my mind that, at one time, I had almost decided to confine these pages to private circulation. The urgent wishes, however, of my friends have prevailed, and I now offer this Memoir, with all its faults, to the public. My fear has been, not so much that of personal criticism—which, I am conscious, is but too well deserved—as the apprehension of failing to do justice to the admirable character which it is my privilege to delineate. I care comparatively little what is said of the writer, provided the end be accomplished—that of presenting a faithful portraiture.

In describing the domestic character, I have quoted largely from the letters of friends, because I felt that thus alone could I confirm representations which, as coming from the widow, might be suspected of undue partiality. If, in writing of a beloved husband, his widow labours under the disadvantage to which I have alluded, one circumstance, on the other hand, is greatly in her favour. No other person can possess so intimate an acquaintance with the mind, the motives, and springs of action of him whose character she sketches. I had the great advantage of being the constant companion of my husband, when not profes-

sionally engaged, and it was my inestimable privilege to share both his joys and his sorrows.

I have felt that, in depicting the life of one so undoubtedly great in genius, my task would be best fulfilled by very simple narration. Simplicity, one of his most striking characteristics, best befits everything relating to him. My office has been little more than that of collecting and recording facts. This I have done with scrupulous care and an earnest desire to be accurate. I have avoided the introduction of extraneous matter, thus excluding many anecdotes and incidents of travel which might have rendered this book more acceptable to the general reader.

Dr. Johnson has observed, in his "Life of Addison," that "History may be formed from permanent monuments and records; but lives can only be written from personal knowledge, which is growing every day less, and in a short time is lost for ever. The delicate features of the mind, and the minute peculiarities of conduct, are soon obliterated."

I am deeply thankful that I have been preserved to leave this simple record of my husband. The task has been to me truly a labour of love, and I dismiss it with reluctance. Gladly would I spend the remnant of my life in writing of one who rendered the larger portion of that life so happy. Fain would I linger over every trait in his admirable character, and retrace every event of those brightest and happiest days of my existence, with which his memory is indissolubly associated.

In conclusion, may I not venture to hope that this

memoir will be read with indulgence, and that its many defects will be pardoned for the sake of the strict and conscientious truthfulness of the facts? I can honestly aver that, so far as my knowledge extends, there is not a misstatement or an exaggeration in the whole work. Throughout its execution I have striven to represent the subject of it as he really was. But alas! how impossible to do this! At any rate, I have the satisfaction of reflecting that the character here developed is well worthy of imitation. One great use of biography is example. May we not hope that the ennobling one afforded by the life of Marshall Hall may not be without its good effect?

C. H.

Blacklands Park, Calne, Wilts,
July, 1861.

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A

BIOGRAPHICAL MEMOIR

OF

DR MARSHALL HALL.

CHAPTER I.

THE CHILD, THE BOY, AND THE STUDENT.

DR. MARSHALL HALL was born at Basford,* near Nottingham, on the 18th of February, 1790. His father, Mr. Robert Hall, was a cotton-manufacturer and bleacher, at that place.

The family formerly lived in those parts of the counties of Nottingham and Lincoln adjacent; their head-quarters were Grantham, in the latter shire. Originally their name was Fitzwilliam, which was gradually dropped and that of Hall used, from their place of residence. At no period do they seem to have been people of very great importance, and were latterly of but little consideration.†

As a cotton-spinner, Mr. Robert Hall followed in

* The house in which his father resided is now called Basford Hall.

† Those interested in such matters will find the pedigrees of Hall of Grantham at the Herald's office, from the time of John Fitzwilliam, attached to the Court of William the Conqueror, down to the seventeenth century.

the wake of the Arkwrights, the Peels, and others of similar celebrity; being contemporary with the Strutts, in the early period of the cotton manufacture. As a bleacher he had the merit of first using chlorine on a large scale. Berthollet had discovered that this gas possessed the property of discharging all vegetable colours, and it occurred to Mr. Hall that it might be applied to the purpose of bleaching, instead of the tedious, cumbrous process, till then employed, of long exposure to the air and light. On this subject he corresponded with Dr. Priestley and Mr. Henry of Manchester, the chemical authorities of that day. Those philosophers, however, did not encourage Mr. Hall's enterprise; and the less philosophical men were so far from conceiving it possible to accomplish in a few hours or minutes that which had formerly required as many weeks, that they designated the place where the attempt was made, "Bedlam"—a title which it still retains, as a perpetual memorial, it should seem, of the triumph of science over ignorance and prejudice. Success crowned Mr. Hall's persevering efforts, and to his genius this country owes the present mode of bleaching.

Professor Liebig, in his "Letters on Chemistry," thus alludes to it as an object of national importance, and as one of the links upon which the maintenance of our colossal manufacturing system depends:—

> But for this new bleaching process, it would scarcely have been possible for the cotton manufacture of Great Britain to have attained its present enormous extent—it could not have competed in prices with France and Germany. In the old process of bleaching, every piece must be exposed to the air

and light during several weeks in the summer, and kept continually moist by manual labour. For this purpose meadow land, eligibly situated, was essential.

Now, a single establishment near Glasgow bleaches 1400 pieces of cotton daily, throughout the year. What an enormous capital would be required to purchase land for this purpose! How greatly it would increase the cost of bleaching to pay interest upon this capital, or to hire so much land in England! This expense would have been scarcely felt in Germany. Besides the diminished expense, the cotton stuffs bleached with chlorine suffer less, in the hands of skilful workmen, than those bleached in the sun; and already the peasantry in some parts of Germany have adopted it, and find it advantageous.*

Mr. Hall thus proved himself a practical chemist, and in this clever application of science to a highly important object, it may truly be said that he evinced genius. He was deeply versed in the chemistry of that day, having closely studied the works of Black, Scheele, Lavoisier, Berthollet, and others. He was also intimately acquainted with the philosophy and application of mechanics, and received a prize from the Society of Arts for the invention of a new crane.

But it was not only for his scientific attainments and inventions that Mr. Hall was remarkable. His unaffected piety, benevolence of character, and sweetness of temper endeared him in a peculiar manner to all who knew him. He possessed a refined mind, genial manners, and a very handsome countenance, beaming with kindness and intelligence. Being contemporary with John Wesley, he became one of his followers, maintaining a correspondence with him.†

* Liebig's "Letters on Chemistry," third edition, p. 28.

† Marshall Hall himself never joined the Wesleyans.

The following particulars are furnished by Mr. Hall's son-in-law, Mr. Higginbottom :—

In the year 1797, on the separation of the Methodists, Mr. Hall was attached to the "New party," or the "Reformers." A report had been raised that the "New Connexion Methodists" were disaffected to Government. This was insisted upon so much, and became so popular an opinion, that it was brought before the House of Commons. On hearing the name of Mr. Robert Hall, of Basford, mentioned, as one of the disaffected body, Mr. Robert Smith, afterwards Lord Carrington, then one of the members for Nottingham, rose and said: "As long as that gentleman [Mr. Hall] is connected with the disaffected body, all will be safe and right; there will be nothing wrong."

Mr. Hall was the finest character and the best man I ever knew, or ever shall know. At the time of the Luddites in Nottingham, when all the country gentry were in constant alarm for their lives and property, Mr. Hall received a letter signed "Ned Lud," the assumed name of the leader of that band of rioters, assuring him that not a hair of his head should be injured; so much was he beloved and respected. He died in 1827, at the age of 72.

Of my husband's mother I can speak from personal knowledge, for I had the happiness of knowing her, although her husband died before I became acquainted with Dr. M. Hall. Her disposition was one of the sweetest and gentlest imaginable. With an entire and affectionate devotion to her family, she possessed much shrewd observation and acute feeling. She lived to the advanced age of eighty-four, in the perfect enjoyment of all her faculties; her old age being, like the rest of her life, marked by kind consideration for others and disregard of self, and presenting a lovely picture, on which her surviving relatives still delight to dwell.

The second son of these excellent parents, Mr. Samuel Hall, has distinguished himself by many useful and important inventions. I may mention that of "clearing" lace or net, by passing it over a fine flame of gas impelled by an air-pump—a process termed "gassing;"* the bleaching of starch; the consumption of the smoke of furnaces; the circulation of the same portion of water in the boiler and under the piston of steam-engines; the reefing and unreefing of paddle-wheels without interruption of their movements. Few persons have, in fact, manifested more originality, inventive genius, and energy in the application of science to manufactures and the useful arts than Mr. Samuel Hall.

The subject of this Memoir was the sixth of eight children. His mother used to relate that, when about four years old, he had a severe illness, which she thought retarded his growth. Recovering from this, however, he became, and always remained, very active and lively. It may truly be said that he was brought up with excellent examples constantly before his eyes, in his parents, and amidst the most gentle influences

* It is by means of this invention that lace made by machinery acquires its fine and even appearance. All uneven and rough filaments are burnt off, as the lace is passed rapidly over the flame of gas. So great was the interest excited by this clever invention, that the late Duke of Sussex paid a visit to Mr. S. Hall's lace manufactory, to witness the operation of the *gassing*. On this occasion His Royal Highness condescended to partake of a *déjeûner* at Mr. S. Hall's house at Basford. Some of the principal gentlemen of the neighbourhood were invited to meet him, and he expressed his admiration of the ingenuity of Mr. S. Hall in the most unqualified and gratifying terms. To these inventions, Nottingham in a great measure owes its present commercial importance.

at home. The discipline was certainly not severe; but, happily, Marshall was not of a character to suffer from the easiness of his parents' rule. His mother used to say that he was ever an affectionate, obedient boy, and that he never caused his parents any sorrow.

Whilst yet a child, he one day went to his father's book-keeper—a Methodist preacher, and therefore, of course, a great authority on such subjects—and earnestly asked him, "Is hell under the sea?" The answer has not been recorded; but the train of thought which induced this extraordinary question was soon manifest, for he added, "Because, if it is, I have been thinking that if we were to bore some holes in the bottom of the sea and let the water through, we might put the fire out!" Thus it seems the originality of his mind began very early to display itself.

He was always very fond of reading; his library, which he treasured up with great care, consisting of the "Pilgrim's Progress," "Sinbad the Sailor," "Jack the Giant Killer," "Robinson Crusoe," the "Travels of the wonderful Baron Münchausen," the "Arabian Nights," and a few other similar productions, which, at that period constituted our juvenile literature. One of these favourite works was constantly placed behind his pillow at night, that he might read the moment he awoke in the morning. His good father caused him to learn by heart many portions of Scripture, and it is remembered that he could repeat whole chapters with great correctness.

At an early age he was placed at the academy of the Rev. J. Blanchard, in Nottingham, that at which

Henry Kirke White received his education. Here he soon acquired a reputation for courage and spirit. A boy twice his size was continually tyrannizing over him. At length the young Marshall, resolved to bear it no longer, fought the big boy, and thoroughly beat him, in spite of his own inferiority in size and strength. The little boy had justice on his side, and abundance of pluck, whilst the young tyrant, like most of his genus, was a coward. This achievement, which took place in presence of the whole school, gained for him a great reputation for spirit; and his schoolfellows were wont to say, "Though he is but a little one, it is best to let him alone." Was there not, in this incident, the germ of that independent spirit which characterized him in later years? As a boy, he was goodnatured and not in the least quarrelsome, but he would not brook injustice and oppression. His sister says that, although never rough and rude, he was very full of fun and delighted in innocent pranks. Although Mr. Hall's elder sons received at Mr. Blanchard's school the usual instruction in the classics, Marshall, the fourth of his sons, was not taught Latin, though he had instruction in French. His father was much occupied, and did not inquire into the studies of the boy, and at that period the classics were not so universally taught as in the present day.

At the early age of fourteen he was taken from school; and at fifteen he read, with intense delight, Dr. Watson's celebrated "Chemical Essays," following up the subject by a study of the works of the unfor-

tunate Lavoisier. Henceforth his life became one of intellectual industry.

About this time he was placed with Mr. Moor, a chemist of some repute and wealth, at Newark. But he greatly disliked his position there, and prevailed upon his father to remove him. At Newark he formed a close friendship with Mr. Robert Cook, then studying for the medical profession, and the two friends together pursued anatomy and other subjects connected with medicine.

Feeling the deficiency of his early education, the energy of his character soon developed itself in vigorous and unaided efforts to repair it. He imposed upon himself the task of writing Latin exercises, which he regularly sent once a week by a carrier to be corrected by his friend the Rev. Robert Almond, then curate of Basford. In a letter written to a sister, from Newark, he says, "I already feel that I can be unremitting in my studies. I rise very early; so much so, that Mr. Cook says he thinks I intend to live without sleep."

It appears that, whilst at Newark, he taught himself to play the flute, though he certainly never devoted much time to it. In another letter to his sister he says, "Bring me all the music you can, as I intend, if I can find time, to practise a little on the flute." He insisted on trying to improve his sisters in French, by correcting their exercises, which, for that purpose, were sent to him regularly. He also gave amateur instruction to the sisters of a friend at Newark, in Latin, chemistry, and short-hand writing. Thus

early, as through life, he was characterized by delighting to aid others. Some of his letters to his friends at home during this period have been preserved. They all breathe the warmest affection for his family, expressing the most lively interest in each member of it, and in the domestic events, with a longing desire to rejoin them.

His friend, Mr. Cook, afterwards became an eminent practitioner at Gainsborough, and, in a letter which I have lately received from him, he says, "Your dear husband was esteemed and loved by me, and nothing can be said in his praise beyond his deserts." Mr. Cook relates that, being called up to visit a patient very early one morning before daybreak, on coming down stairs he found his young friend Hall hard at work, studying medicine and chemistry. When Mr. Cook expressed his surprise, Hall replied, "I am determined to be a great man."

It was now decided that Marshall Hall should prepare himself for the career of a physician. Accordingly, in October, 1809, he repaired to Edinburgh,—

Then the first medical school in the world, and in the zenith of its fame. Its reputation had been raised to an unparalleled height by the Monros, by Black, by Cullen, by the Gregorys, the Duncans, the Homes, the Rutherfords, the Hamiltons, the Bells; by Barclay, Gordon, and many others; whilst the general fame of the University had been ably sustained by such names as those of Robertson, Blair, Hutton, Dugald Stewart, Playfair, Leslie, Brown, and a phalanx of eminent theologians, philosophers, and literati.*

Our young student entered upon his new sphere

* See Memoir in the *Lancet* of July 27th, 1850.

with the ardour and enthusiasm peculiar to him. His first favourite study was chemistry; but, as the groundwork of all exact medical knowledge, he applied himself with unremitting zeal and industry to anatomy. Dr. Andrew Fyfe, of King's College, Aberdeen, son of the late distinguished anatomical professor of that name at Edinburgh, and contemporary with my husband, has kindly furnished me with the following particulars respecting his Edinburgh studies :—

I well recollect the perseverance with which he prosecuted the various departments of medical science, especially anatomy and chemistry.

My first acquaintance with Marshall Hall was a request which he made that I should get permission from my father, who was at that time Professor of Anatomy, to allow him and a fellow-student to have admission to the rooms for practical anatomy in the University, at a very *early hour in the morning*. My father gave permission and, morning after morning, the visits were paid by him and his friend, accompanied by myself. I have no doubt it was at these meetings that he acquired that intimate acquaintance with anatomy which paved the way for his future researches.

I am not aware that Marshall Hall was intimate with any of the students at college at this time. So far as my recollection goes, he avoided intimacy with them, feeling that it would consume time which ought to be devoted to study. He therefore spent his evenings at home, alone, and though frequently invited to my father's house, he seldom accepted the invitation.

Mr. Higginbottom, who afterwards married a sister of my husband's, was his contemporary at Edinburgh, though personally unacquainted with him. He writes as follows :—

We were accustomed to attend Andrew Fyfe, the anato-

mist, about seven o'clock in the evening. At these demonstrations we used to notice Marshall Hall particularly, for his great regularity and attention, though without knowing his name; and, on going earlier than usual to the college, we said to one another, "There will be no one there but the student with the brown greatcoat on, assisting Fyfe to dissect the preparation for demonstration"—so desirous was he to learn all he could, and to be a first-rate anatomist. One evening a dissection of his preparing was shown to the class as a most beautiful specimen of dissection.

His conduct at Edinburgh was, in all respects, so exemplary that an eminent medical practitioner at Nottingham requested him to allow his son to share his lodgings, that he might benefit by his example.

As I have already said, his favourite study, when he first went to Edinburgh, was chemistry; but he was deterred from too exclusive an attention to that important branch of science by a remark made to him by Dr. Belcombe of York, whose son was contemporary with him at Edinburgh. This gentleman observed, "I never knew a great chemist make a good physician." I mention this as having had an influence upon my husband at this period of his studies.

At the commencement of his career in Edinburgh, he wrote and published in *Nicholson's Journal* several papers on chemistry, which showed much originality and research; one of these, in particular, upon the various combinations of oxygen, has been considered very remarkable, especially as the work of so young a man.

But [as a contemporary adds] during the progress of his studies, his attention became concentrated on purely medical

researches, and it was soon evident to all who knew him and were competent judges, that, with his originality, diligence, and assiduity, he must attain excellence in any department of medicine to which he might direct his powerful mind

That he very early determined to make the diagnosis of diseases a special study appears from the following plan, which has lately been discovered among some old papers. It bears no date, but was probably written soon after the commencement of his studies at Edinburgh :—

1. To spend *two* hours in the morning in dissection and the study of operations.
2. Then *two* or *three* in the wards of the hospital ; inquiring particularly into the history, symptoms, treatment and effect of remedies on each patient ; but especially making a particular study of *diagnosis.*
3. The plan of studying diagnosis :—
   (1.) The formation of a diagnostic arrangement by bringing together those diseases which, being *most similar,* are most apt to be mutually mistaken ; and
   (2.) The collection of diagnosis from every *source* of distinction, in the history, symptoms, causes, effects of remedies, &c. &c.
   (3.) This plan embraces *all diseases*—medical, surgical, puerperal, &c.
4. To go through a course of study, comprising chemistry, physiology, and materia medica, in as *practical* a manner as possible.
5. To study the Latin and French languages, reading Celsus, *Heberden,* and Gregory ; Corvisart, Chardel, Pinel, Dessault, Bichât, &c. &c.

This manuscript is written in a remarkably neat hand, and with great accuracy.

The *Lancet* for July 27th, 1850, p. 120.

There has long existed at Edinburgh a society well known to the profession, composed principally of students, and called "The Royal Medical Society." Its members meet weekly, to read papers and discuss their subjects. This institution is said to have exerted an influence on the medical students of Edinburgh, and on their career through life, second only to the University itself.

The late Dr. G. Wilson makes the following remarks upon it:-

It is unquestionably the most distinguished among the student-societies of Great Britain devoted to the prosecution of science. It has existed for more than a century (having been instituted in 1737, and incorporated by royal charter in 1788), and during that period has numbered among its members the majority probably of the physicians, and many of the surgeons, of this country and its colonies. [The greater portion] of the regular attendants at the meetings of the Medical Society are *bonâ fide* students; [and] on occasions of special interest the medical professors and lecturers of the University and extra-academical school, as well as the practitioners of the city, are present.

Each member is required to read an essay on some medical question, a liberal interpretation being put upon the word medical, so as to include purely anatomical, physiological, and other scientific subjects. A copy of this lecture circulates among the members for several days before it is read, so that all who please may make themselves master of the author's views, and prepare themselves for defending or opposing them in the debate which always follows the reading of the essay. As the subjects (selected by a committee appointed for the purpose) are chosen so as to secure the discussion of vexed questions, it rarely happens that the debate flags, and on

"Life of Dr. J. Reid," p. 48, &c.

special occasions, where sides are keenly taken, or senior members engage in the proceedings, the scene presented is one of the most animated description.

It may seem to unprofessional readers a needless matter to make so lengthened a reference to a single society. But those who know how great is the interest taken by the majority of the intelligent students of medicine in Edinburgh in the Royal Medical Society, will not wonder at the special notice taken of it here. It is as truly an educational institution as the University or the medical schools. Its weekly meetings are looked forward to, and remembered, with the keenest interest. To be an office-bearer in it is a duty eagerly sought after; to be one of its four annual presidents is to reach a very high honour; and I question whether any dignity can compare, in the eyes of a medical student, with that which attaches to the office of Senior President. I have seen tears shed at the loss of a presidentship, and the whole student-world is in commotion for days before the annual election.

Of this society Marshall Hall soon became a distinguished member, furnishing papers and entering with great spirit into the various discussions. I again quote from the letter of Mr. Higginbottom:—

At that time there were about two thousand students in the University, in all the classes; and Marshall Hall was considered the first young man there, and as exhibiting great promise. Whenever he entered the room of the Royal Medical Society, he was pointed out and distinguished by the other students, who used to exclaim, "There's Hall! there's Hall!"

In 1811 he was elected Senior President of the Royal Medical Society. This was considered a very high honour at so early an age. The following gentlemen were elected at the same time. The subjoined is an extract from my note book:—

	Votes.
"Marshall Hall, Esq. . . .	41
J. C. Cookworthy, Esq. . . .	27
H. S. Belcombe, Esq. . . .	25
Hugh Ley, Esq.	23"

There were 13 candidates.

Dr. John Davy, the distinguished brother and biographer of Sir Humphry Davy, has favoured me with the following communication, which will be read with interest:—

All my recollections of your dear husband are of a very favourable kind. I remember him as President of the Royal Medical Society, as Physician's Clerk, resident in the Infirmary —his first field for observation—and as a lecturer (the last winter he was in Edinburgh, after he had graduated) on diagnosis, the subject on which he first published.

Being senior to me, we were not on terms of intimacy then. Dr. Boutflower and Dr. Whaley were his particular friends. I can say with confidence, however, that no one amongst the students had a higher character for zeal, ability, and correctness of conduct; indeed, in these respects, he was an example to his fellow-students.

In the Medical Society, of which he was elected Senior President, he was distinguished for a ready and easy elocution and a pleasing manner, which, with the information he gave, always secured him attention

I now proceed to quote the first portion of some most valuable recollections furnished me by my husband's college friend, Dr. Bigsby:—

In March, 1857, when within five months of his death, he received notification of his being elected an honorary member of the Royal Medical Society of Edinburgh. This tribute of respect gratified him much. He looked at his diploma and called it his "crowning honour." It seemed to revive many pleasant recollections of former days.

It is true that my recollections of Marshall Hall apply principally to periods now remote; but it would show a pitiable amount of obliviousness did not some few particulars survive the lapse of time respecting a great discoverer and a great physician, with whom I was in Edinburgh closely associated, and to whom I owed a much-coveted position in the Royal Infirmary of that city.

Marshall Hall was two years and a half my senior, and commenced his studies at Edinburgh a couple of years before me. Although not known to each other previously, we soon met, became friends, and eventually, for a winter, lodged together [in Richmond-place], as was natural in fellow-townsmen engaged in the same pursuits.

Few men have changed during their progress through life so little as Marshall Hall. As he began, so he ended, delighting in the labour—the labour itself—of investigation. Of course his mind grew; became more furnished, enlarged in grasp, combined better, and saw further into the obscure; but the great characteristic remained predominant throughout—a singular amount of conscientious painstaking in all his researches.

Arrived at Edinburgh, my friend settled down at once, and applied his clear practical mind to untiring, unremitting study and bedside observation. All the stores of knowledge which his preceptors had either gathered or created, Marshall Hall was eager to acquire; a hardy, enduring constitution seconding all his efforts. With certain occasional deviations into some of the collateral sciences, to which we shall soon allude, all his energies were directed to the formation of the skilful bedside physician, that is, to the alleviation and cure of disease.

His labours were incessant among books, lectures, hospitals, and among the earnest young men of his day—himself early acknowledged to be the foremost.

All youthful relaxations and public amusements were avoided; and so were other branches of science, unless immediately connected with his profession. He devised, how-

ever, at this time, a differential thermometer, once supposed to be an improvement on that of Leslie ; and he amused himself, from time to time, with a series of experiments on optical spectra, suggested by those of Dr. Darwin ; and his visitors were few who had not in some way to assist.

In his last session in Edinburgh he was appointed Clinical Clerk to each of two clinical professors in succession, Dr. Rutherford and Dr. Duncan.

During his residence in Edinburgh he formed an intimacy with Dr. Duncan, Jun., and assisted him by contributions to the *Edinburgh Medical and Surgical Journal,* even at this early period of life. He also furnished a review of Dr. Sutton's work on "Delirium Tremens."

He has himself described his habits in reading to have been constantly to endeavour to carry his thoughts beyond the statements of his author; and, in experimenting, to think intently on phenomena deemed inexplicable or inapplicable to the matter in hand. This invaluable habit could not fail to lead to discovery and advancement in knowledge.

Such was his constant energy that his fellow-students were wont to say, "Hall never tires."

Leading the most regular and temperate life, his health continued good at Edinburgh, except that, at one time, he was subject to profuse bleedings at the nose. Having passed through an extended course of study, he graduated in June, 1812. The subject which he selected for his thesis was "De Febribus Inordinatis." It was dedicated to his father. In order to acquire a facility in writing Latin, he read

and re-read Celsus, till the style was familiar to him. It was customary for the students to avail themselves of the assistance of what is termed a "grinder," to prepare them for their examinations and to write their theses; but he had no assistance of this kind. He prepared himself, and wrote his own thesis, which was highly commended; and not only did he compose his own, but also those of two friends, whose superior education ought to have rendered this task comparatively easy to them. These theses, written by one self-taught in classics, were approved by the authorities; whilst that of a third friend—a man of superior accomplishments, who wrote his own—was rejected! A striking instance of the success which attends painstaking. The latter gentleman had received a first-rate education, was musical, went much into society, and was a man of elegant manners; but his attention had not been concentrated on his studies —and he was rejected at his examination.

Marshall Hall's examination was short. His superior attainments being evident, he was dismissed with "Bene, domine, bene; satis est!" He had entertained no fear of the result of his ordeal, because he knew and felt that he was thoroughly prepared for it.

It is a fact worthy of record that, during the whole three years of his studentship, he never once missed a lecture!

We have now followed Marshall Hall through his student life at Edinburgh. We have seen the zeal with which he prosecuted his chemical, anatomical,

clinical, and other studies, not content with just the mere amount of knowledge necessary for "passing," but making himself *bonâ fide* master of his subject. We have seen the position which he took at the first medical school of the world. Besides his student labours, we have noticed his contributions to periodicals, some of these contributions being original and important. There is, however, another point of view which places these distinctions still more in relief: it is the circumstance that, besides the ordinary labours of a medical student, and the self-imposed task of writing the scientific papers to which I have adverted, he went through the additional toil of supplying, by his own unaided exertions, the deficiency of his early education. But, as a distinguished author observes, "Natural genius converts disadvantages themselves into stimulants."*

Immediately after obtaining his degree, Dr. Marshall Hall returned to Nottinghamshire, where, however, he had scarcely arrived when he received a notification, as unexpected as gratifying, of his nomination to the office of Clinical Clerk, or Resident House Physician, to the Royal Infirmary at Edinburgh. At that time Dr. Hamilton and Dr. Spens were in office; the former one of the most illustrious, the latter one of the most excellent, of physicians.

Dr. Bigsby remarks:—

This very desirable office was obtained purely by the superior claims of Marshall Hall. He was now placed in a position eminently suited to his qualifications and aims. His field of

* See "My Novel," by Sir E. B. Lytton, Bart.

observation was large, varied, under easy management, and all his own. The will, the power, and the opportunity were well met, for once. To this position we owe his first works, his treatise (as well as his lectures, which I attended) on the "Physiognomy of Disease," and his universally-known work on "Diagnosis;" both derived from daily clinical observation, and principally composed during his residence in the Royal Infirmary.

Visit Marshall Hall when we might, the labour was always going on, and knew no suspension, whether in the street, the house, alone, or in company. The idea of the day was always fructifying and perfecting. Sometimes he was attempting generalizations, or full and well-connected descriptions; at another, overlooking an artist copying from life the effect on the physiognomy and attitude of some chest affection perhaps.

Furthermore, he had the valuable faculty of detecting the portions of medical science most admitting of extension, or most requiring rectification—of this availing himself largely in after life.

The pains were very great which he took to discover a useful and natural arrangement of the numberless diseases which afflict mankind. The various symptoms he grouped together in an abbreviated form, on separate slips of paper, and placed in a multitude of different sequences*—so striving to improve upon his predecessors.

At a later period these publications placed him most advantageously before the profession—being nevertheless in truth only the comparatively small precursors of the magnificent contributions to medical science afterwards to flow from his pen.

Among the very first to recognise the worth of his labours was Dr. Matthew Baillie, then in the zenith of his influence, as I know from the perusal in those early days of more than one encouraging letter from that kind-hearted and sagacious physician.

* This plan of arrangement he continued through life.

During his whole stay at Edinburgh, Marshall Hall was a model to the young men around him in purity of life and conversation, as well as in cheerful assiduity.

He was a good son to his parents, a firm friend, and very fond of teaching and encouraging his younger companions in study.

The following graphic account is from the pen of my husband's excellent friend, Dr. G. Webster, of Dulwich:—

It was in the winter of 1812 that I first saw Dr. M. Hall, on entering the wards of the Royal Infirmary at Edinburgh. I have distinctly in my mind's eye the intelligent, attentive, and ever-active Clinical Clerk, with the official journal-book under his arm, the pen in hand, ready to register the reports and prescriptions of the day, as dictated by Dr. Thomas Spens, whose colleague was the celebrated, but eccentric Dr. James Hamilton, author of a work still ranked among the classics of our profession. I have ever remembered, and duly valued, the admirable manner in which the Edinburgh Hospital was conducted—the *daily* visits of *all* the physicians and surgeons to their patients; the excellent and regular course of clinical lectures on the most important cases; the clinical wards and clinical professors attached to them, in connexion with the University; and the system of constant superintendence, by means of the resident house physicians or "clinical clerks."

Much of the success of this practical teaching—these bedside demonstrations—depended on the conduct and capacity of the clinical clerks, both in *diagnosing* the disease, and in accurately recording all new symptoms as they arose.* In these respects Dr. Hall showed remarkable sagacity and

*ne day, during the clinical rounds in the hospital, Marshall Hall checked the late Dr. W. F. Chambers, who was laughing and talking with some other students, and thus interrupting the clinical lecture. Thirty years afterwards, I heard Dr. Chambers good-naturedly revert to this little incident, adding, to my husband, "You were quite right." —C. H.

judgment; while by his kindness and urbanity in discharging his official duties he greatly encouraged the younger students, who invariably looked with great respect on the Clinical Clerk. I myself viewed Dr. Hall not only as an important official personage, but as one who had attained a most enviable position, to which very few could aspire.

It was during this clerkship, this residence in the Edinburgh Hospital, that Dr. Marshall Hall laid the solid basis of all his future fame, by the close and diligent study of disease at the bedside. As the first-fruits of his industry, he gave, in 1813, a course of lectures, on the "Principles of Diagnosis," to his personal friends, and to those of the students who felt an interest in the subject. His auditors amounted to about fifty, among whom were Professor Grant, of University College, Dr. Robert Lee, &c. These lectures were afterwards expanded into the celebrated work on "Diagnosis," the first edition of which was published in 1817 by Messrs. Longman.

Having now contemplated Marshall Hall, during his educational years, in a scientific point of view, and as an exemplary and successful student, let us pause awhile and inquire whether the whole being of the youth was absorbed in his intellectual culture, or whether the affections of the heart went *pari passu* with the unusual development of mind.

Let us for a few moments draw aside the veil from private life—let us look behind the scenes of academic career, and we shall behold a beautiful picture—the home affections flowing in a pure and uninterrupted stream from a warm and tender heart.

I proceed to quote some letters written by him to his family during his stay in Edinburgh. They exhibit his character far more truly and forcibly than anything which I could write.

The first letter, to his elder brother Samuel, dated Edinburgh, December 3rd, 1809, commences with some scientific observations on the heating and expansion of steam. He then proceeds to say:—

My father desired me to write when I might want money. I have at length (for I really thought I never should have done) paid all my fees, and they have nearly taken all my money. I shall, I hope, for a short time be less tormented for money, but I cannot even enjoy this hope completely; for a few of the lectures endure only for three months, though the greater number, by far, are for six; so that in two months' time, I shall again have either two or three fees of 3*l.* 7*s.* 6*d.* to pay. These excepted, I shall incur no other expenses during five months, but for my board and lodging, which I think are very reasonable.

I am quite at a loss to know whether to return after the winter course of lectures or not. The summer course of three months would be of material advantage to me; and in summer the expenses of lodgings are very much less than in winter, in consequence of the less number of students.

On the other hand, I am so much more deficient in Latin and Greek and in the mathematics than I ought to be, that it would be of signal advantage to me indeed if I could spend *all* the summer with a proper tutor in these different branches. If I could attend some tutor, and lodge and live very retired and undisturbed, I should derive a benefit which would endure *for ever*.

Pray think of this for me, and excuse a short letter that I may write and thank my dear sisters for their letters. I shall *hope* to hear from you as soon as possible.—M. H.

His deficiency in the classics and mathematics still pressed upon his mind, and he wrote as follows on the subject:—

March 24th, 1810.

My honoured Father—It gives me real pleasure to acknowledge your kind letter enclosing ——*l.* I should have written

some time ago, but that I waited till I should hear from you.

I have received a letter from Mr. Witt of Repton, Derbyshire, saying he will be happy to give me all the assistance in his power, and he will be satisfied with whatever Dr. Sleath and a friend of mine may think reasonable and equitable.

Now, having *duly and seriously* considered the matter, I have only to say, that if I be left to my own choice, *I shall not hesitate to accept his offer.* At the same time I submit the case to maturer judgment, and however you may think proper to decide, I shall be contented. I shall say no more on the subject, except that I repeat that I have not formed this decision without having previously considered all the *pros* and the *cons.*

I need not add that I shall be very desirous to know your sentiments on the above subject. I shall be much obliged if you will write a few lines to me; they will much relieve my uncomfortable uncertainty, and will give me much satisfaction.

I believe I shall have the happiness of again seeing my dear parents in May. I should be anxious for this period, but have much to do in the mean time.

I beg my very best love to my dear mother, brothers, and sisters.—Be assured, my dear father, of the dutiful affection of your son, MARSHALL HALL.

The plan which he proposed of reading with a tutor was not carried into effect, and he toiled on alone and unaided, but without a murmur, at his classics.

To his Sisters—on the Death of another Sister.

Edinburgh, Oct. 9th, 1810.

My dearest Sarah—My return to Edinburgh has made me feel our loss more severely. I cannot look towards Leith, towards the ship which conveyed me to my sisters, without renewing the anguish which I feel in our loss. I cannot but remember the anxiety with which I entered the ship—the long eight days, as they appeared to me, that I was at sea—how anxiously I looked for a brisk wind which

should carry me swiftly along to those whom I loved so tenderly! . . . .

Edinburgh, Oct. 9th, 1810.

My dearest Anne—It seems a long time before I shall see you all again. Before that time comes, I have much anxiety to suffer. I shall have to pass six examinations in Latin, of two hours' duration, before I can pass as a physician. The idea of this, and the fear of being rejected—for such a thing is not impossible—will prey and hang heavy on my mind for the next two years.*

I assure you, my dear sister, you do not oftener wish for my company than I do for yours; but this you can conceive. You have the company of Sally and my mother. I am here isolated, an outcast, or at least a voluntary exile from society. If I could spend my Sundays at home, or if you could be with me, I should be happy indeed. . . .

In a short time I shall be looking forward to settling in the world; then, if my dear sisters live with me, it shall not be one of the least of my studies to make them as happy as I can; nothing would be a more real pleasure to me than to be able to do this. Would that I may be able! It is one of my consolations that, if I do not meet with great success in my profession, so as to be able to make myself rich, yet I shall, which is better and happier, be able to lead at least a useful life. No one has it more in his power to relieve distress, to befriend the friendless on the most needful occasions, than a medical man, if he be disposed to do it, and I hope I shall never want charity.—&c. &c., MARSHALL HALL.

Edinburgh, June, 1811.

My dear Sarah—A fellow-student leaves Edinburgh to-morrow on his way to London. He of course passes within a quarter of a hundred miles of all that is dear to me on earth, and inclination, not less than this opportunity, invites me to write to you. I cannot feel a more exquisite pleasure than I now do, under the impression that I am conversing with my dear, my dearest Sarah. . . . .

* I know, from himself, that as the time for examination approached, fear gave place to the consciousness of being thoroughly prepared.—C. H.

I have little more to add, except fresh and unnecessary assurances of love as unchangeable as the universe. My dear sisters do not half know the sincerity, the integrity, the earnestness of my love to them.

How does our little niece do? I suppose I shall see a charming, prattling girl, when I come to Basford again; and among my inquiries let me not forget my little John. [His brother.] I am anxious indeed to hear that he is placed under Mr. Almond—I hope, to make progress in knowledge.

And now, my dearest Sarah, good-bye. Let me hear from you soon, and let us be more constant in our interchanges of love and affection.

Give my love to my dear father and mother, brothers and sisters, and believe me, what I have ever been, and ever shall be, your most affectionate brother, MARSHALL HALL.

In the preceding letter his anxiety about his youngest brother is remarkable. Having himself suffered from a neglected education, he constantly sought to obviate this evil in the case of his brother John. It is rare to find one brother manifesting such earnest solicitude for the education of another, the parents being still alive.

August 28th, 1811.

My dear Sister—I am rejoiced to hear that John is pleased with Mr. Almond, and is likely to make much improvement. I should like to see an attempt of his at letter-writing. I hope he will write better letters than it will ever be in the power of his brother Marshall to do. I often wish he had a strong inclination for the medical profession. If I should be prosperous, I should be able to do much for him. I only fear that, when he should be studying *things*, he, like myself, should have *words* to study.

So our little niece is advancing in stature and in the affections of all! I promise myself much delight in the opportunity, which I hope another summer will bring me

of enjoying her sweet prattling and infant innocence, and of embracing a living monument of our departed sister.

I have no time left to write you anything about myself and my little tour; but as I am sure you will be delighted in hearing of *my delight*, I shall give you some account of my movements, in answer to your next letter. I may just say, that we were out ten days and a half; walked, on an average, thirty miles each day, which makes about 300 miles. With regard to the Highlands, they surpass all description and all conception. I will give you some account of them in my next. One thing only was wanting to render the enjoyment of my tour complete. I never beheld a sublime and beautiful view; I never was pleased with the sweetness and beauty of a walk, or a sail on the beautiful lakes; never was struck with wonder at the contemplation of a lofty waterfall, or of a tremendous and terrible precipice, or of mountains 4000 feet in height, without feeling that none of my pleasures were unattended by the vacancy of solitary enjoyment, and by the most ardent wish that my dear sisters could share the pleasures, but escape the toils, of our journey, for some toils we had, I do assure you.

Give my best love to my dear mother, and thanks for her attentive nursing of you—also to my father and brothers—and be assured of the eternal love of your affectionate MARSHALL.

Edinburgh, Sept. 27th, 1811.

My dear Father—With regard to myself, I think I have every reason to be contented with my prospects. I hope I shall be elected Clerk at the Infirmary; indeed there is every chance of it—but you know elections are never sure. It is an admirable situation. The fee is 20*l.* a year, besides board. I must stay two years; at the expiration of which time, I do not hesitate to say, I shall be prepared for practice. After that, different ways are open to me. If I can do nothing better, I will enter the army or the militia, until a fair opportunity of commencing practice occurs.

However, I am quite happy with my situation, and not over

fond of money. I hope I shall always be so. A doctor has at least an ample field for the practice of charity and benevolence. I may say that no man has more *talents* than a physician — would that I may be able only to improve them!

I am at present busy composing my Thesis. . . . .

Edinburgh, Dec. 20th, 1811.

My dearest Anne—I cannot tell you how gratified I am with your kind letter. . . . . I need not say that I am just now particularly busy; if you consider that the University examinations are impending, you will readily conceive that my whole time must be completely engaged; they commence at the end of March or the beginning of April.

I am particularly glad to hear that my father is well-contented with my advancement in my studies. Since I began to study, it has been my great wish to make him pleased with permitting me to follow the predilection I felt for the study of medicine. If my father feels satisfied, I should not care for the observations of a whole censorious world besides.—MARSHALL HALL.

Edinburgh, August, 1812.

My dear Sisters—Once more I regard with a heavy heart the length of time and of distance by which we are to be separated from each other.

I cannot describe the crowd of thoughts which rushed through my mind the moment I parted with you; the very elements themselves seemed at war, and all things concurred to induce a state of mind not to be conceived or described.

I never feel the parting until the moment comes, and then, oh, then, I am overwhelmed with feeling. But I will not dwell on this subject. You dwell in my heart, my dear sisters.—MARSHALL HALL.

1812.

My dear Father—I write to you with heartfelt satisfaction from the Royal Infirmary, surrounded by some of the most destitute and miserable objects of our nature, amongst the most loathsome and most mortal maladies, which are the daily objects of my care and observation. It is not difficult to conceive whence

my satisfaction arises—not surely from the frequent occasions of seeing my fellow-creatures so wretched and helpless; no, it is rather from my *efforts, at least,* to obviate the calamities of humanity, from that real and practical knowledge which I cannot fail to acquire of their proper treatment, with the hope of at length becoming, after so many years' preparation, a respectable and a useful member of society. I have often recurred, in my letters to you, to this topic. I wish you to feel, as I am persuaded you do, that my becoming a medical man will have been the cause of my chief happiness in this life. I am sure you will be rejoiced to hear that I still regard it as such.

I hope you are all quite well at home. Does my little Ellen ever inquire for her uncle Marshall? I find I shall not be able to resist the gratification of seeing you all again next summer. . . . .

I am preparing a paper or two for the journals.

Let me hear how the grand experiments succeed. I expect to be Chief Physician to his Majesty through their means still.—Your most affectionate and dutiful son MARSHALL.

Edinburgh, 1812.

My dear Sarah—No, my dearest of sisters, I do not measure your love by the number of letters you write to me; but if I may judge from my own feelings, I may truly say that a more frequent correspondence would be the means of giving it further vigour and growth. Short absences from those we love most dearly, increase our endearments; but long absences, unless frequently prevented by interchange of letters and love, have an opposite effect. And when I consider that it is more than a dozen years since I was at home in any other capacity than that of a visitor, I sometimes feel a little temporary fear lest so long an absence from the bosom of my friends should have an ill effect on their hearts towards me. But these are my childish fears, and they respect you, my dear sister, least of all. Your letters are the refreshing dew that waters the flower of my affection, which only requires the sweet light of your countenance to come into perfect blossom.

What do you say to our young surgeon's* coming to Edinburgh? I am all wishes, hopes, and anxiety, but my hopes predominate. Before you receive this, he will have set off; and when you see him again, I trust it will be to rejoice, to praise and love him the more.

William Wright comes to Edinburgh in about a week or a fortnight. He would bring my silk stockings, also a *Quarterly Review*, and above all some *tea*. It is my *bon-bon*.

My success, hitherto, has given content. Few succeed in a plan of study who do not deserve it.—&c., MARSHALL HALL.

September 20th, 1813.

My dear Father—The real pleasure I enjoy in writing to you has always one alloy. I can never answer *your* letters—or rather, I ought to say, I can never answer those models of excellence which it is your constant kind care to place before me. When you bestow praise, I always fear lest I should not deserve it; when you set before me some new excellence, I always lament that I shall never be able to attain to it; yet will I always try; and though my ruling passion be ambition, yet *it shall be* the ambition of being *good* as well as *great*. If numerous *good resolutions* could make me so, I should not be undeserving to be called your son. I confess, however, my resolutions are too transitory, and sometimes, in the moments of despair, I look forward to the time when I shall spend some time at Basford, full of the determination to profit more than I have done by good example. In the meantime let me enjoy the pleasure of hearing from you frequently. Another ecliptic will soon be traversed, and then I hope to see you all again.

Tell Sarah the leaves that were green and the flowers that bloomed when I was at Basford, have now begun to fade and disappear, marking one of the periods that were to transpire before my return. They were to wither, to be buried in snow, to bloom again, and again to wither, before

* His younger brother John.

my return. So she expressed, and so have I retained and sealed in my memory words that flowed from her heart.

You mention my book [alluding to the "Diagnosis"]. I intend to give a full abstract of my plan in some publication, but the work itself will be the employment of some years. It is, however, so far advanced as to convince that it will contain some sterling worth and useful information.

I cannot say anything about my plans; only that, having considered the *pros* and *cons*, I have been induced to give up the idea of London. I feel that I shall succeed in a place where I shall be able to make my acquirements known. But the fear of failure, and, what is more, of the concern that my failure would occasion you and my other friends, has caused me to venture less in another place. The only regret I feel is that I shall not be able to lecture; I am *persuaded* that I should have something substantial to deliver in lectures, on a new, useful, and *practical* plan; but all this can be done in a publication. I have expressed these sentiments to my best friend, Dr. Duncan, Jun., who thinks them the most prudent.

There is one thing, my dear father, that I wish to mention in this letter, and that is, that you would take the pains to calculate my expenses exactly, and let the proper deduction be made. I wish to contract my ambitious views a little; persuaded that, in this way, I shall be able to do with my share only. You will not be hurt that I should wish to be like my other brothers and sisters. It is a good feeling that I have, when I mention this, and as such I hope you will accede to my request. If, after all, I should require more, I shall not hesitate to borrow; a necessity to which, however, I hope I shall always be too circumspect to be reduced. I was happy before, but I have been happier since I came to the resolution I have mentioned. Because, notwithstanding the sanguineness of my temperament, I was always beset by the fear of bringing distress on you and myself by attempting too great things. My ambition

has received what I regard as a salutary check, and all will go on now happily, I trust.

I know my dear father wishes to know the workings of my heart—so I have given them.

Dr. Spens (I forgot to say) has seen my manuscript, and approves of it highly—as an exercise for myself, and as a work for the public. But all unite in recommending delay in the publication. When I come to Basford I must show it to Dr. Storer. Dr. Spens and I are better acquainted than ever, and better pleased with each other still—at least, this is my case.

It is time to conclude. Write to me soon. Above all things, attend to your health. Give my best love to my dear mother and to all the rest, and always consider me as your most affectionate son, MARSHALL HALL.

September 24th, 1813.

My dear Father—My last letter would inform you that I have given up all idea of fixing in London. I have begun to form other plans, which it is the object of this letter to lay before you.

I have a year to remain at Edinburgh. At the expiration of this period I wish to spend four months in London, and then I think I ought to look about me and begin to think of fixing my tent. I should very much like to travel a little abroad; but this, I fear I shall not be able to accomplish. Failing in this, I think it would be advisable for me to fix somewhere. Some years must be spent without much employment; these I would occupy in general reading, particularly in preparing my work on "Diagnosis." This latter part of my employment could not pass unobserved, and I think would give me a reputation that would promote my views of practice. I would devote certain parts of the day to the Infirmary of the place; my mind would be occupied; I should not suffer from the fatigue and tediousness of having nothing to do; and thus I think I should engage gradually in practice, as soon as I ought to expect or wish.

In the meantime I wish we could employ some friends in

looking about for the most desirable situation. I have heard much of Bristol. I should like that town exceedingly. It is, at all events, of the utmost importance to anticipate the time of my going, because I ought to obtain every possible introduction, and this cannot be done in a day. I shall be anxious to hear from you on the subject.

These and other questions, and especially that which regards your own health, I hope you will soon devote an hour to answering. I am always gratified and grateful for your letters.

Give my best affection to my dear mother, brothers, and sisters, and believe me ever your most affectionate and dutiful son, MARSHALL HALL.

October, 1813.

My dear Father—Your letter, which had been anxiously looked for, gave me real pleasure, because I hope and trust the plan which I have suggested for John, will in the event afford us all additional reason to be thankful that my wayward genius led me to become a doctor. I begin already to feel the anxiety and responsibility connected with my important charge. If we should succeed, mine will be the keenest joy, and if we should fail, the deepest sorrow; but I like to indulge the fairer prospect of bringing home my *protégé* the happiness and admiration of his parents and friends.

My first object has been to fix him comfortably and respectably for the period that intervenes, before he enters as a resident in the Infirmary. I have, with this view, made an agreement with a very decent, excellent woman, whose manners have prepossessed me strongly in her favour, for his board at 55*l.* a year. It is an excellent, pious family, Presbyterian, true-blue, known to an excellent friend of mine, a young surgeon in Edinburgh, a second Mr. Almond, who, in addition, has promised to consider John in the light of a charge, after my departure from Edinburgh.

I tell you all this, my dear father, to set your mind at ease. I think John's the fairest prospect the medical *world* could afford, and I hope most sincerely that it never will be

materially clouded. Considering all the advantages of the place, the expense is really wonderfully little—the advantages themselves incomparably great.

Now, then, I look out for your letter, and afterwards for my dear lad, with sanguine hopes and expectations!

With regard to my own plans, I think of trying to remain three or four months longer than I once intended, partly from the wish you express that my stay was longer on John's account. I then wish to see some foreign parts of the world before I fix, if I can manage it. This, with three months in London, will bring me to twenty-six. I shall then try to fix, and I hope and trust all my exertions will be crowned, as they certainly have hitherto been attended with every success I could desire.

In the meantime I live in the hope of seeing you in Edinburgh before I quit it finally.—Your most affectionate and dutiful son, MARSHALL HALL.

In dismissing that portion of the life of Marshall Hall spent at Edinburgh, I will only add a few details, descriptive of his general character and habits. His only surviving sister says:—

He was peculiarly refined in his conduct and character; and although remarkably gentle, feeling, and affectionate, he was extremely cheerful and playful. To quit his home was always a grief to him.

His few chosen associates at Edinburgh were young men of gentlemanly manners and of irreproachable conduct. Indeed it is observable that, through life, he never attached himself to any man of coarse mind or manners. The late Dr. Whaley and Dr. Boutflower were his most intimate friends. The former afterwards settled at Ripon, and the latter at Hull. Dr.

His friendship with Dr. Boutflower did credit to his taste. He was a most refined, charming person, and Marshall Hall loved him like a brother. Both he and Dr. Whaley died before middle age.

Boutflower was distinguished for his accomplishments, Dr. Whaley for more solid attainments, and both for their unaffected piety. Dr. Hall's friendship for these excellent men continued to the close of their short career.

In speaking of my husband's friendships I again return to the valuable notes of Dr. Bigsby:—

Mr. Boutflower was the son of the rector of Seamore, near Scarborough. He introduced his young friend to Mrs. Watson, an excellent widow lady with a young and agreeable family residing in Dewar-place; but Hall had previously formed the acquaintance of Mrs. Hamilton, the authoress of "The Cottagers of Glenburnie," of Mrs. Grant of Laggan, the authoress of "Letters from the Highlands," and of Mrs. Fletcher, then perhaps at the head of the literary society of Edinburgh. These introductions enabled him to mingle occasionally in the best circles. It is pleasant to add that death alone interrupted the friendly interest taken in our well-conducted student by these distinguished ladies.*

Marshall Hall soon became almost domesticated in Mrs. Watson's cheerful and accomplished family, and gave it the benefit of his example, and his knowledge, general and medical. Domestic intercourse is of the first necessity to young men away from home; but it was particularly useful to Hall, as a salutary and pleasant relaxation from intense study.

The distinguished and excellent Mrs. Fletcher above alluded to, after a lapse of nearly forty years, related to me, in the following admirable letter, her recollections of my husband:—

Lancrigg, 28th May, 1850.

My dear Mrs. Hall—You ask me to send you my reminiscences of my early acquaintance with your husband.

I remember when our friend Dr. Whaley was about to leave

* The *salon* of Mrs. Fletcher was, at an earlier period, the resort of Lord Brougham and his distinguished contemporaries.

Edinburgh he told me he wished to introduce a friend and fellow-student of his to our acquaintance, saying, "I am sure you will like him; he is so intelligent, modest, and well-principled;" adding, "he is the most sincerely pious young man I have ever known." This prelude to the introduction of our friend Dr. Hall, no doubt prepossessed us greatly in his favour, and everything confirmed this prepossession. We perceived that there was much enthusiasm in his character, of generous admiration for all that was truly great and good. He was an ardent student, always preferring professional study to any pleasure or amusement which could be offered to him. We had much pleasure in his society, because it was equally free from dulness and frivolity, and bespoke a strong mind occupied with important subjects. We lost sight of him for many years after he left Edinburgh; but the cordial reception he gave us when we rang at his door, after so long an interruption to our acquaintance, induced me to recommend my eldest son in 1830 to consult him on his way to Jersey, and dear Miles wrote me word that Dr. Hall received him with the kindness of a brother, and retained a most lively recollection of the evenings he had spent with us in Edinburgh. Several other events* prove his disinterestedness and warmth of heart.—Believe me, my dear Mrs. Hall, yours very sincerely, ELIZA FLETCHER.

In another letter Mrs. Fletcher thus expresses herself:—

I must say that, of all the young men whom it was my lot to know in Edinburgh, your husband is *the one* whose memory of "auld lang syne" is most gratifying to me, and does most honour to the warmth of his heart.

The same lady also told me that my husband was the most distinguished student of his time at Edinburgh. She spoke of the modesty and agreeableness of his manners, adding that his intelligence was

* It is unnecessary to mention the particulars.

so great that she never was in his society without learning something from him, even at this early age.

A similar observation was frequently made by the father of Marshall Hall, and indeed by many others.

[made a memorandum, at the time, of these observations of Mrs. Fletcher, during a visit to her at Lancrigg, in June, 1848. This remarkable and admirable woman died in 1858, in her 89th year, beloved by all who knew her. She became the mother-in-law of two distinguished men—Sir John Richardson, the Arctic traveller, and Dr. John Davy, brother of Sir Humphry Davy.

CHAPTER II.

VISIT TO THE CONTINENT—SETTLING AT NOTTINGHAM.

In 1814, after a residence of two years in the Royal Infirmary, making altogether five years passed at Edinburgh, Marshall Hall finally quitted the northern capital.

About to enter on the great theatre of the world, he left his Alma Mater with mingled feelings of regret and hope. He has been depicted as "strong in hope, inflexible for truth and justice, but inexperienced in the ways of the world, and unable to cope with the cunning, or to dissemble with the false"—characteristics which he retained to the end of life. Our youthful aspirant viewed the bright side of the picture, and feeling confident of his own powers, determined to do what talent, industry, and perseverance could do.

After a short stay with his friends, he availed himself of an invitation from Dr. Harrison, a Yorkshire gentleman of fortune, to accompany him to Paris. On the point of starting for the Continent, he addressed the following letter to his father :—

Downing-street, April, 1814.

My dear Father—This letter must needs be very valuable and interesting, for it is written on Lord Castlereagh's paper.

Dr. Harrison and I are waiting attendance here in Downing-street for passports, the servants of the public not being yet at their posts at 12 o'clock.

I have ten thousand things to say to you. The first, as the most remarkable, is that I returned from a visit to Blackheath this morning and saw the Chancellor of the Exchequer * returning *on foot* to town, a distance of half a dozen miles; a contrast to the first piece of intelligence I communicated to you. He is an excellent plain man; his days are said to be spent in doing business, his leisure in doing good; frugal with the public money, generous with his own.

I shall take every opportunity of writing to you from the Continent, to tell you all that is interesting, and to remind you occasionally of the deep affection and duty of your absent son.

It is much to be regretted that none of the many letters which he wrote home, during this absence, can be found.

At Paris he was dazzled with the splendour of the Louvre, which at that period still contained all those treasures of the arts of all ages accumulated from Italy and other countries by the first Napoleon, and destined to be so soon afterwards restored to their rightful owners. Few, probably, are now living who beheld this wonderful concentration of the glories of sculpture and painting before they were re-distributed. They made a profound impression upon our young traveller, which was never effaced. Here also he saw Talma, whose dignity and accents he never forgot.

Having visited the medical schools of Paris, he proceeded to those of Berlin, Göttingen, &c., the reverses of Napoleon at Moscow having opened these capitals

* The Right Hon. Nicholas Vansittart, afterwards Lord Bexley.

for a brief interval. He made the journey from Paris to Göttingen alone, and on foot, a distance of 600 miles, during the month of November, 1814.

The tract of country which he thus traversed had very recently been the seat of war, and presented many perils to the lonely pedestrian. As the shades of evening approached, he frequently pursued his way along the forest-road with a cocked pistol in his hand, for fear of wolves. Once he missed his way, and, in endeavouring to recover it, was benighted, and took refuge in a lonely cottage—not, however, to sleep; for all around were seen rusty implements of war, which had been gathered in the track of the armies—that of Napoleon flying towards Paris, and that of the Allies closely pressing upon his rear. His host was a maker of *sabots*, and he was heard moving about through the night. The pistol was again in readiness. As morning dawned, a few francs were laid on the table, the door gently opened, and the free air and the track across the plain recovered. The route now led through Verdun—too well known to some of our heroes in misfortune—Metz, Mayence, and Giessen. At Göttingen he made the acquaintance of the venerable Blumenbach.

Returning to England in 1815, he repaired to Nottingham, with the intention of settling there; but, as there were already four physicians in that town—then scarcely half its present size—he was induced to forego this plan, and Bridgewater was selected as his residence. At this period the following gratifying letters were addressed to friends at the latter place, by the

distinguished physicians under whom he had studied at Edinburgh. The first is from Dr. Rutherford:—

Edinburgh, Sept. 13th, 1816.

Sir—Though we have had no intercourse for a vast many years, I with pleasure now address you in consequence of a letter I received from Dr. Hall, as he informs me that you wished to have my testimony as to his abilities.

I can, with great truth, assure you that he stands high in my estimation. He officiated as Clinical Clerk to me, when I was engaged in delivering lectures, some years ago, on the cases at that time in our Infirmary. Then I had an opportunity of observing his great attention to the sick, and at the same time of learning his sound knowledge with respect to diseases. After this time he was Physician's Clerk in the Infirmary, where he conducted himself in the most exemplary manner. I cannot say indeed that we have had any young person attending our University who seemed to me to be fitter in all respects for practising physic than Dr. Hall. I should rejoice indeed to hear of his being well established, as I am confident that he will give satisfaction in the exercise of his profession.—I have the honour to be, with the greatest esteem, Sir, your most obedient humble servant, D. RUTHERFORD.

The next, from Dr. Duncan, Sen., is addressed to "Dr. John Dunning, Physician, Bridgewater."

Edinburgh, 13th Sept. 1816.

My dear Sir—Although half a century has now elapsed since we were fellow-members of the Medical University, in 1766, yet I trust that both of us have often reflected with pleasure on the companions of our studies in youth, and that I still hold a place in your remembrance, as you do in mine.

Permit me, on this score, to recommend to your notice the bearer of this letter, Dr. Marshall Hall, who graduated at our University in 1812. During the course of his medical studies at Edinburgh I had many opportunities of being very intimately acquainted with his merit, from his having officiated as

my Clerl in the clinical wards of the Royal Infirmary. The attention which he bestowed on the duties of that important office, as well as on every other part of his medical studies, did him very great honour, and, I hope, furnished him with much useful knowledge. In the confident hope that he will pursue the same line of conduct during his future life, permit me to recommend him to your patronage, and believe me to be yours ever and sincerely, ANDREW DUNCAN, Sen.

The address of the two following letters is torn off and lost.

Edinburgh, 15th Sept. 1816.

Sir—From the character which Dr. Marshall Hall bore in the city and University, I was very anxious for his being appointed my Assistant in the Royal Infirmary, on a vacancy happening in summer 1812. My expectations were not disappointed, for his intelligence, assiduity, attention, and amiable manners immediately secured my confidence and esteem. He continued to assist me for about a year and a half. I was very sorry that his interest and views did not permit him to remain longer, and I parted with him with great regret. I retain a most sincere regard for him, and remain, Sir, your most obedient humble servant, TH. SPENS.

Edinburgh, 18th Sept. 1816.

Sir—I can only confirm the very high character given of Dr. M. Hall, on the opposite page, by my friend Dr. Spens. I was intimately acquainted with Dr. Hall during his whole residence in this place, and always considered him as one of the very first of our students in everything which renders a young man promising and estimable.

I have to add, that I am greatly interested in his success in life, and to express my conviction that he will give satisfaction to all who may in any way become connected with him.—I have the honour to be, Sir, your obedient servant, ANDREW DUNCAN, Jun.

At Bridgewater and in its neighbourhood Dr. Mar-

.e. Physician's Assistant.

shall Hall was very well received. It was during his short residence there that he once met Sir Humphry Davy at dinner, at Mr. Poole's of Stowey—an event to which he always looked back with pleasure.

Finding but little scope for practice as a physician at Bridgewater, he remained there only six months. Brief as was his stay at that place, he made there many warm friends. From one of these he received the following expressions of regret at his departure:—

I hope you have been right [in leaving]; but I know your situation here must have been *highest* in point of respectability and practice. I find I am reverting to the old subject and must say no more; but I feel your loss deeply and hourly more severely. Our friends say —— will not do after Dr. Hall; the carriage, &c. may impose for a moment, yet the sterling merit and modesty of our friend Dr. Hall would soon have surmounted all obstacles, and we should have had confidence in his friendship, society, and advice. I tell you just what I hear.

I knew nothing of the principles of practice till I became acquainted with you; my treatment frequently succeeded, but it was oftener empirical. I now attend strictly to symptoms, the only sure way of practising. I value your advice beyond all price, and hope to adhere strictly to it *in all cases*. My wife and myself can never look on James without reflecting that, but for your kind and friendly attention and skill, he would have been lost to us for ever; and we speak together of any future illness with dreadful apprehension. Your departure is constantly and daily lamented by every one whose good opinion you valued.

In February, 1817, Marshall Hall took up his abode in Nottingham. He was now scarcely twenty-seven years of age. Every one knows the difficulty of acquiring practice as a physician thus early in life. But the

fame of his career at Edinburgh, and the important works which he immediately proceeded to publish, produced their natural and legitimate effect in speedily procuring him an extensive practice. I must, however, follow his progress in detail.

It was during the first year of his residence at Nottingham that he published his celebrated work on "Diagnosis." Some of my unprofessional readers may perhaps be unable to understand the nature of this work from its title. In fact, I am told by medical friends, contemporary with my husband, that, previously to his lectures and writings, the word diagnosis, now so generally adopted in medical phraseology, was as little heard of as the study which it designates. Those then of my own sex who are not Greek scholars ought to be informed that the term and the work relate to accurate observation of the minutest symptoms, and the classification of those occurring in each disease; or, in a word, to the detection and distinction of diseases. Marshall Hall believed that such observation alone leads to accuracy, and that it ought, therefore, to form the chief study, as it is the only sure guide, of the physician, enabling him not only to detect maladies which escape the ken of a superficial observer, but also to discriminate between those which, although in some points resembling each other, are yet diametrically opposite in their nature, and consequently require different treatment.

The reader will recollect the great attention which he devoted to this subject during his student days at Edinburgh. Thus early cultivated, with the aid of a

naturally acute perception and great powers of observation, the accurate detection or diagnosis of disease remained throughout his career one of his great characteristics as a physician, and in after life he always, in lecturing, inculcated the importance of ascertaining the exact nature of a malady before attempting to treat it. It has been ably observed, in regard to his first selection of a subject, that—

As diagnosis is everything in legitimate and scientific medicine, it was the indication of a penetrating mind to perceive this at the very starting point of a medical career. The subject has never been taken up by any other physician. No mere systematizing of what other men had gathered, but an original treatise resulted from the labours of his student life and early years in the profession. Comprehensive, lucid, exact, and reliable, this work has, in the main, stood the test of forty years' trial. A better has not been produced.*

He himself said that he wrote it "literally at the bedside of the patient," while in the Royal Infirmary at Edinburgh; it was therefore chiefly composed before he was twenty-four years of age, and may justly be regarded as a very extraordinary instance of early original talent and industry. The preface to the first edition, in 1817, besides being otherwise a remarkable production, is graced with much candour and modesty.

Dr. Conolly, in his lectures on the "Physiognomy of Insanity," says:—

As there is much difficulty in putting into words the shades of expression and modifications of attitude which convey this

* The *Lancet* for Aug. 15, 1857.

sort of knowledge to the practical observer, there appear to be few works, at least in the English language, which treat of it in connexion with the general subject of medical diagnosis. It has been, indeed, chiefly, and almost exclusively, cultivated and enriched by the late Dr. Marshall Hall, whose work on "Diagnosis" is said to have been commenced when he was a student in Edinburgh, and whose writings on Symptomatology* contain, in a condensed form, much that deserves the careful attention of the student and of the young practitioner.

These works were, in fact, the development of the lectures which he gave during his student days at Edinburgh. It was respecting the former work that the celebrated Dr. Baillie wrote the following letter to Dr. M. Hall :—

Lower Grosvenor Street, July 21st, 1818.

Dear Sir—Some time ago you were so kind as to send me, through Mr. Denman,† a present of your work upon "Diagnosis." The object of it is most important, the execution of it is very able, and I have read it with great advantage.—I remain, dear Sir, your most obedient servant, M. BAILLIE.

Such a letter as the above, addressed to an unknown country physician by a distinguished man at the head of his profession, President of the College of Physicians, and Physician to the King,‡ does high honour to the candour of its writer. The following incident is related by Mr. Higginbottom :—

Dr. Marshall Hall, being in London some months after the publication of the "Diagnosis," called upon Dr. Baillie, who received him very kindly and said, "I hope your father is well; I, for one, am much indebted to him for his extra-

* See "Cyclopædia of Practical Medicine."
† Afterwards Lord Chief-Justice.
‡ George III.

ordinary work on 'Diagnosis.'" When Dr. Hall modestly told him that he, not his father, was the author of the work, Dr. Baillie exclaimed, "Impossible! it would have done credit to the greyest headed philosopher in our profession." He then invited Dr. Hall to breakfast with him.

One of Dr. Hall's sisters had married Mr. Higginbottom, then a young surgeon established in Nottingham, now a veteran in the profession, and well known by his valuable work on the "Nitrate of Silver," and by other excellent contributions to medical and surgical knowledge. Between the brothers-in-law the greatest cordiality existed. They lived near to each other, and continually met and talked over the cases of their respective patients. It is to this gentleman that I am indebted for much valuable information respecting this period of Dr. Hall's life; the following is from his pen:—

At the commencement of his practice the Doctor wanted money. I offered him three or four hundred pounds—my first earnings; but he refused it, and borrowed from another person the smaller sum of one hundred. This he soon repaid from his practice.

It was not long before he obtained a large and lucrative practice among the principal families of the county, inclusive of "the Dukeries,"* which are at a considerable distance from Nottingham; besides being frequently summoned to the neighbouring county towns, as Derby, Leicester, &c. A very pretty purse has been preserved, which was presented to him,

* The well-known district comprising the splendid seats of the Dukes of Portland and of Newcastle, with that of the Earl Manvers.

accompanied by the following kind note, and containing ninety guineas:—

Welbeck, March 4th.

Lady Charlotte Greville begs Dr. Hall will do her the favour to accept the enclosed purse of her own netting, with ten thousand grateful thanks for the kind interest and attention he has shown to her little grandsons, which can never be forgotten.

Wherever he attended, his skill inspired extraordinary confidence, and his kindness warm gratitude. That he should have won early success will not excite surprise, when the reader shall have patiently followed me through a brief account of the works which he produced during his residence at Nottingham.

In 1818, a year after the publication of the "Diagnosis," he completed another work, entitled "On the Mimoses; or, a Descriptive, Diagnostic, and Practical Essay on the Affections usually denominated Bilious, Nervous, &c." In a second edition the title was changed to "An Essay on Disorders of the Digestive Organs and General Health, and on their Complications."

I now proceed to quote some memoranda dictated by my husband, when on a bed of sickness, shortly before his death, which will manifest the immense importance of his habit of forming an accurate diagnosis:—

When I began practice in Nottingham, I was promptly struck with the fatality amongst the puerperal cases; I observed that they almost uniformly combined diffused and violent pain over the abdomen, with severe affection of the head; and that they had been uniformly bled. They were

considered as peritonitis, for which blood-letting was deemed the essential remedy.

I began to doubt the correctness of the diagnosis, and, of course, of the mode of treatment; and, after much and careful observation, I found them to be—not cases of peritonitis, but of intestinal load and irritation. The lancet was abandoned, and the bowels were relieved by mild aperients and enemata —and the patients ceased to die.

I published a pamphlet on the subject,* which I dedicated to the late Dr. Baillie, who wrote me the following letter on the occasion :—

"Duntisbourne, near Cirencester, Sept. 27th, 1820.

"My dear Sir—I return you many thanks for the small volume which you have been lately so good as to send me; and I have read it with much satisfaction. It will lead the attention of medical men to a form of disease hitherto not much observed, and of a most serious nature. It will point out, likewise, a more successful method of treating it, and will tend to check the system of bleeding, which I am afraid is becoming too universal.—I remain, my dear Sir, yours very faithfully, M. BAILLIE."

The next work which issued from the pen of Marshall Hall was a small volume "On the Symptoms and History of Diseases," published in 1822. The following letter from the amiable Dr. Baillie relates to it :—

February 10th, 1822.

My dear Sir—I need not say that I feel exceedingly gratified by the dedication of another of your works to me. It is, in a great measure, new in its principle, and must be extremely useful in detecting the nature of the many internal diseases to which the human body is subject. I am surprised that so young a man should have observed so much and so

* "Cases of a Morbid Affection, chiefly occurring after Parturition, Miscarriage, &c., and arising from Irritation and Exhaustion." Longman. 1820.

accurately the external signs of internal diseases. I think that the work will soon be in the hands of every practitioner who feels interested in the liberal improvement of his profession.—I remain, my dear Sir, yours very faithfully, M. BAILLIE.

I now resume the autobiographical memoranda :—

My attention was next directed to the study of the effects of loss of blood. I wrote a paper on the subject, which was read at the Medico-Chirurgical Society of London [and published in its Transactions.]*

From this period, through many years, the detraction of blood gradually diminished — the effect, I believe, of the dissemination of these views.

The extent of this change in practice is demonstrated by the progressive disuse of the lancet, and the diminished number of leeches employed. On the latter point, the following documents, in regard to the sums expended on leeches at the General Hospital at Nottingham, during the successive years from 1825 to 1854, are full of the deepest interest.†

The following is from the pen of Mr. Higginbottom :—

The great value of Dr. Hall's knowledge of diagnosis was early manifest in his successful practice in Nottingham, particularly in preventing the loss of blood. The established opinion at that period was, that almost all pain, in any complaint, arose from inflammation. The practice of blood-letting was carried to a fearful and fatal extent, particularly in puerperal cases. The ignorance of the profession generally of the diagnosis between puerperal peritonitis and intestinal irritation was the cause of many deaths, owing to the great loss of blood supposed to be required to subdue the complaint.

So manifest was the dire result of venæsection, that one of our oldest physicans declared to me, "We have killed the

* The subject was expanded by him in a work entitled "Medical Essays." Longman. 1824.

† This document was published in the *Lancet* of July 1st, 1854.

patient by bleeding so often ! "—the repetition of the bleeding being followed by an aggravation of the complaint.

Those medical men who have commenced practice within the last thirty-five years can have no *practical* knowledge of the old plan of treatment. My late brother-in-law, Dr. Marshall Hall, was the first person who arrested the slaughtering practice of blood-letting, by his accurate diagnosis, before he published his work on "The Effects of Loss of Blood," in 1824. During the ten years of his residence in Nottingham I had daily communication with him in practice, and watched the very important change in the treatment of disease. He used to call the lancet "a minute instrument of mighty mischief."

I have no hesitation in affirming that the old system of blood-letting has destroyed hundreds of valuable lives. For many years after I commenced practice, the lancet was in hourly use in the hands of medical men.

Some important facts are recorded by the late Mr. Booth Eddison, of Nottingham, in the following letter to Dr. Marshall Hall :—

Nottingham, May 30th, 1854.

My dear Friend—I have frequently thought upon the difference between the treatment of disease now pursued, and that adopted for the relief of diseases *similarly named,* from twenty to thirty years ago.

I remember, when a student, having bled seventeen patients at the General Hospital in one afternoon ; and bleeding from the arm and by leeches was an every-day practice.

I understand from my friend Mr. White, the present House Surgeon of the General Hospital, that venæsection has not been resorted to more than twice in the five years he has held office there, and the use of leeches has greatly diminished—probably from 100 to 20 (80 per cent.).

I am of opinion that this change in practice has arisen from your writings.—&c., &c., BOOTH EDDISON.

It has been remarked—

It is hardly possible to overrate the importance of these inquiries. They revolutionized the whole practice of medicine. A new light broke in upon the medical world.

Loss of blood was shown to be at the root of much that had passed before for various grades of inflammation.

As an instance of the change in practice produced by Marshall Hall's accurate diagnosis, the throbbing temple, previously treated by depletion, is now known to arise, in many cases, from loss of blood.

I now return to the autobiography :—

During my stay in Nottingham, my attention was particularly drawn to the peculiar maladies of the sedentary female population employed in "chevening," lace-running, &c. On this subject I also wrote a little volume, which was published at Nottingham.

The enthusiasm with which, at an early age, Dr. M. Hall pursued chemistry, his first favourite study, has already been mentioned; as likewise the delight with which he read Watson's "Chemical Essays," and afterwards the "Elements of Chemistry" by the unfortunate Lavoisier. He retained a great predilection for this branch of science, and, although busily engaged in practice, whilst at Nottingham he prepared and published several experimental essays on chemical subjects, to one of which he alludes in the following notes :—

During my stay at Nottingham I pursued an investigation on the chemical relations of iron and water. Previously iron was stated, in all the elementary works on chemistry, to decompose water when placed in contact with it at ordinary temperatures. This I demonstrated to be erroneous.

It is not true that iron placed in contact with *pure* water decomposes it. The iron remains perfectly bright, and no bubbles of hydrogen rise.

The relation of iron with distilled water, under ordinary circumstances, is complicated; the water contains absorbed oxygen; it also contains absorbed carbonic acid: if this exist in sufficient quantity, it acts like some other acids, as the sulphuric, inducing the decomposition of the water, the iron becoming oxidated, and bubbles of hydrogen gas rising to the surface of the water.

These experiments were performed at Sneinton, a suburb of Nottingham. My father watched the slow progress of them, during my journeys to see my patients, with constant interest, often "wondering," when any phenomenon of interest occurred, "why the Doctor did not come." The occupation added much to my dear father's happiness during its continuance, the recollection of which is gratifying to me at this distant hour.

The paper on this subject was published in the "Journal of the Royal Institution," and is still quoted by Liebig.†

The same principles apply in regard to zinc: some experiments on this metal were read at the Philosophical Society of Manchester, of which Dr. M. Hall was immediately elected an honorary member. The fact in regard to zinc is made use of by Liebig in his "Chemistry Applied to Agriculture."‡

Besides the works already mentioned, Marshall Hall, during his residence at Nottingham, contributed several papers to the Royal Medical and Chirurgical Society, which were printed in its Transactions. He

On another occasion he thus described this process: "It is accomplished, not by the decomposition of the water, but by the union with the metal of its *mixed* oxygen, a process resembling the respiration of fishes."

† See "Chemistry of Agriculture and Physiology," ed. 3rd, 1843, p. 219.

‡ Edit. 3rd, pp. 35-40.

also wrote a paper "On the Physiology of Speech," and one upon the "Movements of the Barometer," which were inserted in the Journal of the Royal Institution.

I have quoted the generous letters of Dr. Baillie; I now add one from the Rev. J. J. Cleaver (who afterwards took the name of Peach), which proves that the former eminent physician kindly recommended Dr. M. Hall to his patients:—

Tockington, Bristol, Dec. 14th.

My dear Sir—Will you give me a line to say upon which of your works Dr. Baillie wrote to congratulate you, and founded his recommendation to the Manvers family?—&c. &c., JAS. J. CLEAVER.

Mr. Higginbottom relates:—

I remember that a practitioner from the country consulted Dr. Baillie on the propriety of his commencing practice in London. He received for answer—"I know of only one young man who would succeed well if he came to London, and that is Dr. Marshall Hall; *he* would be the first physician in London in five years."*

Dr. Fleetwood Churchill, of Dublin, says, in a recent letter:—

I first knew Dr. M. Hall when I was in Nottingham. We all looked up to him with becoming reverence. I well remember his active figure, intelligent face, and decided manner. At that time he was in the highest practice, and had refused Dr. Matthew Baillie's offer of an introduction to London practice. A friend of his and mine, the late Rev. Henry Corrie, told me of this offer.†

Dr. Matthew Baillie died Sept. 23rd, 1823, three years before Dr. Hall's removal to London.

† The late Rev. H. Corrie was at that time a medical practitioner. He was brother to the Bishop of Madras, and also to the Rev. James Corrie, late Vice-Chancellor of Cambridge.

The following quaint and singular letter from a clergyman in Nottinghamshire to a friend will, I think, amuse the reader:—

Bunny, Thursday.

Dear Sir—I am very glad to hear so good an account of Sarah. As Dr. Hall has seemingly arrested the complaint, I hope ere long he will turn it out of doors. I really think it very fortunate that she has fallen into such clever hands. Dr. Hall is like a good terrier; if he once gets sight or smell, he gives a disease no rest or respite, but follows it up until he has got it into a corner, and then worries it to death. [The writer then rejoices that the patient did not fall into the hands of one who would] have bored five or six holes in her veins till he had bled her to death, and would thus have cured her complaint, as Mr. Frost of Nottingham was once going to cure a smoky chimney for me, by knocking the house down.—&c. &c., W. B. COCKER.

In 1818 Dr. M. Hall was elected a Fellow of the Royal Society of Edinburgh.

In 1825 the office of Physician to the General Hospital at Nottingham becoming vacant, he offered himself as a candidate for it. Another physician also entered the lists at the same time, and presented a strong opposition. At first Dr. Hall wrote to every subscriber and used great exertions to secure his election. Having done this, he rested quietly, his opponent meanwhile carrying on a very active canvass. On hearing of the extraordinary efforts made by the latter to procure his election, a sister of Dr. Hall's, astonished at his coolness and calmness, said, "You are not likely to succeed, for you are doing nothing." He playfully replied, "Give yourself no trouble about it; I shall be elected." And so he was, by a large

majority. The fact is, he knew that a host of warm friends among the best families in the county were energetically engaged in his behalf. The Rev. J. J. Cleaver, whom I have already had occasion to mention, kindly wrote to the Duke of Portland for his vote, and received the following reply :-

Welbeck, Oct. 8th, 1825.

Dear Sir—Before I received your letter, I was persuaded by what I had heard of Dr. Hall that the Hospital ought rather to have been a candidate for him than he for the Hospital. Your letter convinced me of the propriety of my opinion.

I regret very much that I shall not be able to prove it by my vote, as I am confined to my room by the gout, and shall certainly not be able to go to Nottingham on Tuesday.—Ever, dear sir, yours very sincerely, SCOTT PORTLAND.

I have recently had the pleasure of conversing with an early and most kind friend of Dr. M. Hall's, the Venerable the Archdeacon of Nottingham, Dr. Wilkins, distinguished, not only as an author, but also for his noble and amiable qualities, to whom I shall ever feel deeply grateful for his true, disinterested, and firm friendship towards the subject of this Memoir. At my request he has kindly embodied, in the following letter, his reminiscences of my husband :—

Residence House, Southwell.

Dear Mrs. Marshall Hall—My acquaintance with your late deeply-lamented husband commenced in 1818, just after my institution, as Vicar of St. Mary's Church and parish, in Nottingham ; and as my house was situated within a few yards†

The original letter has been preserved.

† Dr. Marshall Hall resided on the High Pavement.

of his, I had the opportunity and advantage of daily meeting with him; and having, moreover, a large and young family, I had the additional benefit of enjoying such friendship, and deriving such beneficial medical advice, as subsequent years served to strengthen and more thankfully to appreciate. At that period, though wholly unacquainted with medical science myself, I took a lively interest in the welfare and success of one whom I found profoundly devoted to his profession—one who, denying himself the indulgence of amusements and social relaxations, either busied himself at home in his laboratory or library amidst books and experimental studies, or was abroad with patients demanding his services from every quarter of the town and county.

I knew that, while at Edinburgh, he had been considered as a young man of great promise, possessing great originality of thought and deep inquiry; a reputation which, preceding him to Nottingham, had already given him the prospect of that success which afterwards so rapidly met him.

He was then stout and of middling stature, neat in his person, simple in his appearance and address, with a smile ever ready to light up his countenance. His walk was rapid, betokening thought and anxiety; while, heedless of external scenes and occurrences, it was seen that he had ever some object or matter in view, engaging his mind and absorbing him in contemplation.

I never knew him to accept an invitation of pleasure; I believe he never dined from home; at least I know that, near to him and intimate with him as I was, I never could persuade him to dine with me; in fact, I think he never dined at all, but, like the celebrated Dr. Glynn, of King's College, Cambridge (whom I had often seen in my boyhood), he only ate at such times as hunger or thirst compelled him to resort to a corner table for a morsel of whatever he might find there constantly provided for him.

At the commencement of his practice he kept one or two riding horses, afterwards three or four, as that practice in-

creased, riding them on all occasions, however near or distant his patients might be, the distances often being very great.* This mode of conveyance did not long continue; the exertion and exercise proved too fatiguing, and he had recourse to a gig, and a servant to drive it; by which means he was not only less worn and harassed, but was enabled to read as he travelled. In my daily constitutional walks I frequently met him, when a short conversation uniformly ensued, mostly relating to the subject of his contemplations. I observed that he was never without a Bible at his side, together with divers medical periodicals.

At other times, when we met in the streets, he had ever something amusing to say; late in the evening he would step into the vicarage for conversation on some experiment that he had made or was making; or he inquired after and looked at the children, myself, and wife, to see "what we needed in *his* way;" or he would expatiate on scientific subjects and pour out a flood of intelligence upon our senses. Sometimes, with Paley in his hand, he would deliver such a lecture on the structure of the body and its members, in proof of the marvellous wisdom and benevolence of God, showing how "fearfully and wonderfully" we are made, as was sufficient to put the sophistry of Deism in the dusty scale of the balance against the preponderance of Divine Revelation.

Dr. Hall was always rapid in his movements; but in the sick room, where I had so very frequently to meet him, he was calm, placid, and encouraging, explaining to the patients or their friends the objects of the medicines and orders he prescribed, and inspiring patience and hope. Very numerous were the instances in which, under Providence, he succeeded

* He was very fond of his horses, rode them fast and treated them well, often going to see them fed. They knew him, and would turn round on hearing his voice. He was a good horseman, and never had the slightest accident, although often riding over the country in a pitch-dark night. A friend asked him, "How is it that your horses never fall?" He replied, "I never give them time to fall." He had a large portrait painted of one of his favourites—a beautiful animal—by Mr. Barber, a portrait-painter of great repute at Nottingham.—C. H.

in restoring to health my wife, myself, and various members of my large family. Can we therefore fail to retain with grateful feelings the memory of that mortal instrument in the hand of the Almighty by which health and vigour have been restored to us?

I am unable, at this distance of time, to recal much of what passed between Dr. Hall and myself in the course of the eight years that he was my neighbour, beyond the clear recollection of his unwearied attention to the many cases of sickness that occurred in my own family, and to the still greater number of those of the poor to whom he so generously permitted me to direct his attention and advice. Upon all these occasions his charity was great, his manners soothing, and his temper such as I never saw at any time ruffled, or otherwise than mild. His time and talents ever devoted to public practice or private study, he pursued the even tenor of his way for the good of others, in self-denial of his own ease.

I saw little of him for the first fifteen years after he quitted Nottingham, although I constantly made inquiry of him from his friends; but it was in 1841 that I carried up one of my sons for his advice in what had been pronounced a hopeless case, and I shall never forget his calm manner, combined with deep sympathy, when, after much inquiry, he requested my wife to commit to writing what was the first symptom, and what she conceived to have been the cause of the malady. Upon reading this over on the following day, he observed, as there was nothing hereditary in the case, he would, provided his mother were nurse, exclude all despair. For six successive weeks he visited the youth continually, sometimes more than twice in the day, and at the end of that period, under Providence, the patient was restored to such health and strength as have never since failed him. You cannot be surprised that the earlier feelings of gratitude and admiration of him were revived, and that future time and renewed opportunities served only to increase them. But it was, I think, in 1852 that I resorted to him in town for self-consultation with him, when, as soon as I was seated in his room, and before I could open

my case, he stopped me and exclaimed—"Say nothing; I see what is the matter with you and what you want;" and then, in his rapid way, and still more rapid manner of writing, he made out a prescription, explained its object and how it was adapted to my well-known constitution, and requested me to report myself to him in a few days. This I did, announcing the complete success of his advice, and what I considered, and afterwards found to be, my perfect restoration. But, he added, "There is one thing that you positively *must* do; and that is, dine with me and a few nice friends to-morrow." This I could not refuse. The dinner was a simple, wholesome one, and Colonel Francis Seymour was the only other guest.

It was at this time that his active mind contemplated the establishment of a hospital for the sufferers from that awful and, as he called it, "that herculean malady" epilepsy, a subject which had engaged his profound attention and charitable feelings; and he spoke of it with an ardent desire to effect his object.

I think the last time of my meeting Dr. Hall was after his return from America in 1854, when he came to see me here, and when I was enabled to take his valuable and successful advice in the case of a little grandson of mine, grievously afflicted with epilepsy. On this occasion he, for the first time in his life, *dined* with me. He was at that time evidently labouring under some disorder which he must have known and felt to have a fatal tendency; but he was calm, cheerful, and full of conversation, detailing many interesting particulars of his late voyage and travels, together with amusing observations on men and manners in the "New World," when, turning his eye in a playful mode towards me, significant of my early knowledge of his having been an Ultra-Whig (if anything at all), he said—"Ah, Archdeacon, I confess it, I went to America 'a Whig and something more,' but I returned a Whig indeed still, but very much less of one!"

Here then I come to the conclusion of my reminiscences, which go but very, very little way in tracing the character of

the departed, or in conveying to you my admiration of his genius, and the grateful respect I entertain for his memory. This tribute, such as it is, is due from my friendship; it constitutes but a slight, though correct sketch of him, who, while living, was so much beloved and admired, and who now in death is so deeply and generally deplored.

With every sentiment of unfeigned sympathy, believe me, dear Mrs. Marshall Hall, yours very truly, GEORGE WILKINS.

The venerable writer of the above letter was engaged in the authorship of a well-known work called "Body and Soul," during Dr. Hall's residence near him in Nottingham, and had sent him some of the proof-sheets for perusal. Dr. M. Hall having retained these longer than was convenient, Dr. Wilkins facetiously wrote a note to the following effect: "Dear Dr. Hall—Do send me back my body and soul; I cannot exist any longer without them." The note was given to Dr. Hall's man-servant, whose curiosity led him to press its sides so as to be able to read the contents, for it was long before the modern fashion of envelopes. He rushed, aghast, into the kitchen, exclaiming, "Cook, I can't live any longer with the Doctor!" "Why, what's the matter?" "Matter enough," replied the man; "our master has got Dr. Wilkins's *body and soul*, and I have too much regard for my character to stay where there are such goings on!"

Mr. Higginbottom says:—

To the poor he was always most kind and considerate, giving them gratuitous attendance and other assistance. He not only gained their confidence, but their affection, in an extraordinary degree.

The following little incident was related to me by a hair-dresser, who, at the time it occurred, had a large family and was contending with poverty. Dr. M. Hall went to this person to have his hair cut, and, on leaving, put a guinea into his hand and hurried away. On perceiving that he had received a guinea instead of a shilling, the hair-dresser, concluding it to be a mistake, ran after the Doctor to return it, but found it was intentional. His kind actions were indeed innumerable; the tithe of them will never be known, for his generosity was thoroughly unostentatious.

His practice was almost entirely among the county families, and his fees, like those of London physicians, were guineas. I have no means of ascertaining the annual amount of what he received; but it must have been considerable.

It cannot fail to strike the reader that an immense mass of original and highly important matter emanated from his pen during the ten years which he remained at Nottingham. Such an amount of thought and literary labour would have been no mean accomplishment for the entire life of a man of perfect leisure, who could, at his ease, quietly arrange his ideas and commit them to paper. But it has been seen that Marshall Hall immediately became immersed in a large practice, which occupied him morning, noon, and night. He literally passed his days in either riding or driving; for a widely-spread county practice, it must be remembered, is far more fatiguing and absorbs much more time than that of a town.

Such genius and such success could not, according to all experience in human nature, fail to excite jealousy. Some of the medical practitioners in Not-

tingham manifested great bitterness, and even refused to meet in consultation a physician so much their junior. On one such occasion, Dr. M. Hall sought the counsel of the amiable and aged Dr. Storer, who had always been most friendly to him. The wise advice given was—"*Keep your patient*, and take no notice of Dr. —— !"

CHAPTER III.

REMOVAL TO LONDON.

GREAT as was his success at Nottingham, the limits of a provincial position did not satisfy the mind and aspirations of Marshall Hall. In fact, he had always looked forward to London as to the world of genius and science, determined to build there for himself an enduring reputation.

To quit an excellent practice in Nottingham and to come to the great metropolis, where he was entirely unknown, except from his works, was a bold step, and required no little self-reliance. He had, in fact, been discouraged from making this experiment by some who considered the measure as one involving a great risk with small chance of success. Aware that it would be anxiously opposed by his family and his attached friends and patients, he did not communicate it to them; and its exact period was not fixed in his own mind. In August, 1826, he made a visit to London, which resulted in his remaining there. The event is graphically related by his brother-in-law, whose words I quote:—

The Doctor left Nottingham for London without saying a word to any one. When he had been there above a week, Mr.

Oldknow, with a serious face, made inquiry about his return, on account of his duties at the General Hospital. I wrote to him, and he answered my letter by saying that he should not return to Nottingham; that I must sell his furniture, horses, gig, &c., and pay all his bills, which I found were very few. So little did he regard pounds, shillings, and pence, that he left a number of guineas loose and unlocked in a dressing-room drawer. Everything indeed was left as if he had only gone out on his usual daily round to visit his patients. Some time before this he had placed in my hands a mortgage-deed of 600*l*. On opening it, I found that it was drawn up in my name. I told him he could not claim a penny of it. "Never mind," was his reply; "pay me the money when I want it." In process of time he sent for portions of it. When I had paid him the whole sum, I asked for a receipt in full, and he wrote at the bottom of the account: "Received all this—MARSHALL HALL."

The above simple narrative strikingly exemplifies Dr. M. Hall's unbounded confidence in his brother-in-law, and his own distaste for money affairs. Although most scrupulous in owing no man anything, he had neither the time nor the inclination to occupy his mind with pecuniary matters. He always valued fame far more than money, appreciating the latter chiefly as an evidence of having attained the former. But, in truth, it was science that he loved. The money which its cultivation produced was indeed an accessory both useful and agreeable; but it was not the aim and end of Marshall Hall's scientific labours. Had it been so, he would never have pursued physiology, as he subsequently did; for he well knew that, owing to a vulgar prejudice, its pursuit would detract from the gain of mere money.

When it became known in Nottinghamshire that he had removed to London, there was great lamentation. It is hardly possible to convey any idea of the implicit confidence in his medical skill, or of the personal attachment and respect which he had inspired. I have often heard him say that there was far more of friendly feeling among patients in a country district than in the wide metropolis. In the former, a man's private character is known and appreciated, and in Nottinghamshire his patients became his personal friends. At this period I was entirely unacquainted with him; but, in visiting a family in the neighbourhood of Nottingham, I was forcibly struck with the very warm terms in which he was spoken of by his former patients. His loss was deplored as a real bereavement. His professional skill, his amiable, warm-hearted, and pure character, together with the superior intelligence of his conversation, had left a profound impression. We must now follow him to his new sphere of action: and first I will quote his own words:—

In the year 1826 I repaired to London. I deposited a sum of money with Sir C. Forbes's firm, to defray my expenses during the first year or years of my residence in the great metropolis. I never had to draw upon this fund: my former patients at Nottingham continued to consult me, chiefly by letter, and my little reputation accompanied me, so that my expenses were paid, and I speedily set up my carriage.*

His Nottinghamshire patients remained constant to him, and at each return of the London season the

* This consisted of the equipage then usual among physicians, viz., a pair of horses, a chariot, and coachman and footman.

highest families from that county were numbered in his list, whilst fine venison from his old neighbourhood annually proved that he was not forgotten. A kind letter from one of his warm friends—the Rev. J. J. Cleaver—has been preserved, and, as it confirms what I have already said in regard to the feelings entertained towards Dr. Marshall Hall, I cannot forbear quoting it. Its date shows that it was written seven years after his removal to London :—

Tockington, Dec. 20th, 1833.

Many thanks to you, my dear Sir, for your kind present of the "Diagnosis" and your other work. Believe me, it was not mere idle curiosity which led me to trouble you with the queries respecting the former, and regarding your success in the Westend of the town. They were both occasioned by a sincere interest in yourself. Your answer to the first has confirmed the truth of a statement of mine which had been called in question, as that to the last gives us the satisfactory feeling that we have not been deprived of your assistance (which we have often mourned over) without some redeeming considerations, and that a step, which many of your friends (half selfishly, perhaps) deemed a bold one, has answered your best expectations.

My little boy James, whose life I always considered you saved by your prompt decision at Cuckney, came yesterday from Southwell. . . . —Believe me, my dear Sir, your obliged and sincere JAS. J. CLEAVER.

In selecting a residence, Dr. M. Hall placed himself at No. 15, Keppel-street, Russell-square; a good and commodious house. I have already alluded to his dislike to the details of money matters. This led to the following arrangement on commencing practice in the metropolis: the late Mr. William Burnside, an intimate friend of his, having entered into partnership

with the well-known publisher, Mr. Seeley, had recently removed from Nottingham to London, with his wife and family. It was soon agreed that they should share Dr. Marshall Hall's house; the rent and chief expenses of which, the latter, however, paid. He was glad to have friends with him, and to delegate all household affairs to Mrs. Burnside. This arrangement, which continued about two years, also obviated the loneliness which, with his domestic habits, he would otherwise have felt on coming, a stranger, to the great capital.

The following incident will convince the reader that his eagerness after fees was not very great; nay, I fear we cannot entirely acquit him of some carelessness in regard to money, his mind being intent upon greater things. Mrs. D—— thus relates her first acquaintance with him :—

It was in 1828 that I first saw Dr. Marshall Hall. My case had been pronounced hopeless by another physician, who declared that I could not survive another month.

During five years Dr. M. Hall treated my case without fee or reward. His indifference to pecuniary recompence was fully proved by an oversight of mine. Previously to our first interview, I had wrapped in one paper the guinea fee, and in another the fare for the hackney-coachman. On arriving in Keppel-street, where the Doctor then resided, I had forgotten this arrangement, and paid the coachman from my purse. When my visit terminated, I placed the envelope, containing the supposed fee, on the table, and left. In the evening of the same day, I drew from my pocket the other envelope, and found, to my utter consternation, that it contained the fee! What was to be done? How could I remedy an act of such gross carelessness, but by confession and reparation? The Doctor came, and with no little confusion I told the naked fact. He replied that he thought I must be mistaken, refused the second proffer

and never took a fee from that day, although he came to watch my case twice and sometimes three times daily.

Some time afterwards I met with Mrs. Burnside and told her how incomprehensible to me the Doctor's assertion was, that he did not know I had left him a two-shilling fare instead of his fee. She replied, "That is quite possible, for, unless the fee were placed in his hand, he never looked for it. So constantly did this happen, that, as soon as he left his consulting-room, I used to go in and collect the fees, locking them up in a drawer!"

During his first year in London he received from his practice 800*l.** Usually physicians are long in London before they acquire any practice. It was not so with him—the fame of his works had preceded him; he rapidly gained celebrity, and by degrees his practice increased considerably. His generous friend Dr. Baillie was no more; but Sir Henry Halford, who succeeded him as physician to the Sovereign, then George IV., and as President of the College of Physicians, was also liberal in his praise of Marshall Hall, and, in attending the daughter of Mrs. H——, who had been pronounced consumptive, he advised that lady to consult Dr. Marshall Hall; adding, "He is the rising sun of the profession; there is no one to compare with him, and he will become the leading physician in London." The young lady was accordingly taken to him, and he found the case to be, not consumption, but one of those which he had, with great acumen, described in a recent work. She recovered perfectly under his care, and is now the mother of a family.

* He was accustomed to take his money to his banker, and to make all his payments by cheque; thus his professional income was ascertained without his keeping accounts.

Soon after coming to London he presented himself at the College of Physicians as a candidate for the Licentiateship. The examination was in Latin, and he acquitted himself so well that Sir H. Halford, himself an accomplished classic, and noted for the elegance of his Latin compositions, complimented him upon his Latin. Yet the reader will remember that he was self-taught!

Although, as we have seen, some of the highest members of the profession were generous in their praise of Marshall Hall, there yet were numerous petty spirits who delighted in opposing and traducing him, jealously and ignobly endeavouring to retard the progress of his fame.

A year after his removal to London he published his "Commentaries."* This work brought him much practice in cases of the nature therein described. It was illustrated by plates beautifully executed, showing peculiar conditions of the tongue, the complexion, the lips, the hands, the nails—their form, hue, brittleness, &c.—and many other symptoms, most of which he was the first to observe, and to associate with those various disorders of the health which he found they indicated. These observations had been carefully made during his residence at Nottingham, the subject being alluded to in his memoranda already quoted. In these cases he was most successful; health, bloom, and spirits were restored, after due perseverance in his plans, which, besides the medical treatment, included mental occu-

* "Commentaries on some of the more Important of the Diseases of Females." Longmans. 1828.

pation and much systematic exercise in the open air—points upon which he always insisted very strongly. I mention this for the benefit of readers of my own sex.

Still pursuing the subject of the effects of loss of blood, in 1828 he read a paper at the Royal Medico-Chirurgical Society, and afterwards published a volume "On the due Administration of Blood-letting," in which he proposed a *rule* to determine the quantity of blood proper to be abstracted in those cases where venæsection was deemed essential. This was further treated of in his work entitled "Researches, chiefly relative to the Morbid and Curative Effects of Loss of Blood;" a work which was deemed by the profession to be of vast practical importance. The following quotation will give the reader some idea of its chief object:—

A rule for the administration of blood-letting, in cases requiring full depletion, was deduced by Marshall Hall from the consideration he had given to this important subject—a rule by which the detraction of too much or of too little blood is equally avoided. The patient is placed sitting perfectly upright, looking upwards, the arm being previously prepared, and the blood is allowed to flow from a *free* opening to incipient syncope. If there be inflammation, and youth, and strength, there is great tolerance of loss of blood, and much blood flows before syncope is induced; this is precisely what is required in such cases. If, instead of inflammation, there be only irritation, there is early syncope from the flow of blood, and the vital fluid is economized, the just and proper quantity still, however, being taken. Many valuable lives have been saved by the adoption of this *rule:* being adopted, it also affords a diagnosis in obscure cases of inflammation and irritation.†

Published by Messrs. Longman in 1830.

† See the *Lancet* for July 27th, 1850, p. 124.

Mr. Higginbottom, after long experience, does not hesitate to say :—

I have no doubt that Dr. Marshall Hall's knowledge of diagnosis and his rule for blood-letting have been the means of saving thousands of lives, if I may judge from the success attending his mode of practice in Nottingham, particularly in puerperal cases, as it was soon adopted by the profession.

We thus see Dr. Matthew Baillie's early and sagacious prognostication fulfilled. One general practitioner, in speaking of the value of this simple rule, emphatically adds, "I have no words to describe the satisfaction, the comfort, the confidence I have felt, and the benefit my patients have derived from my attention to your maxims on this subject."

In 1828 Marshall Hall read another paper at the Royal Medical and Chirurgical Society, "On a Hydrencephaloid Affection of Children, arising from Exhaustion." It has been said :—

It is almost impossible to exaggerate the importance of this paper; but all who have seen much of the diseases of children must be familiar with the affection described by Dr. Hall, and many can recollect the time when the treatment of such cases ended almost universally in death. The cases adduced are of extreme interest, and show how frequently the effects arising from exhaustion are mistaken for inflammation or congestion of the vessels of the brain.†

He had previously noticed this subject in his "Medical Essays" before any other author. Dr. Abercrombie and Dr. Gooch afterwards wrote upon it.

Medical Times and Gazette for Aug. 29th, 1857, p. 227.
† Pettigrew's "Medical Portrait Gallery."

A question having been raised by some reviewer as to priority, Dr. Gooch candidly acknowledged that it belonged to Dr. M. Hall.

On the 11th of November, 1829, our marriage took place, and in the following September we removed to 14, Manchester-square, where, for twenty years, we continued to reside; then quitting it for 38, Grosvenor-street.

In 1830, new editions of the work on blood-letting and of the "Commentaries" were published; and, in the following year, a very small volume, entitled "Eupædia; or, Letters to a Mother on the Watchful Care of her Infant," to which the author's name was not affixed. These letters, which are gracefully written, are replete with the most valuable information and advice.

A retrospect of the twenty-seven years during which Marshall Hall pursued his practice in London, does not afford much variety of event. Excepting the tour which we annually made on the Continent, there was little to mark the lapse of time. Year after year rolled on with much uniformity, each day greatly resembling its predecessor, and bringing with it the same occupations: the morning reception of patients, the afternoon round of visits, and then the quiet of home gladly regained after the labours of the day—a brief interval of relaxation, and afterwards the evening's occupation of experiment and writing, for the evenings were not spent idly.

But, amidst this apparent monotony, not a year, perhaps not a day, passed without yielding important

results in science, patiently and laboriously worked out night after night.

Let no one imagine that great results are to be obtained without much mental labour. Discoveries in science are not mere lucky accidents, as some may suppose. An every-day fact is *seen* by all, but *observed* by an observant man only. To such an one it suggests some ruling principle; to discover this principle requires ordinarily great research; and even when he thinks he has discovered the laws which govern the phenomena, these must be closely examined, pondered over, and viewed in all their relations before he can pronounce them to be satisfactorily established.

Taking a rapid survey of what Marshall Hall had accomplished, from the commencement of his medical career up to the period at which we have arrived, we find that he had, through exact observation of symptoms, discovered that the most serious mistakes had been made as to the nature of some maladies, and that these mistakes had led to an injurious method of treatment, and frequently to fatal consequences; whilst a contrary mode of treatment, founded upon his accurate diagnosis, resulted in recovery. He often said that he owed much of his success to his never taking anything for granted, as fact, merely because stated as such by those who had gone before him, however great the authority might seem to be.

Hitherto he had been chiefly occupied in the observation of disease; he now began, as Dr. John Davy happily expresses it, to pass

From an observer into the inquirer; from merely noticing the symptoms of disease, with their indications, into scrutinizing their causes; in other words, from, as it were, the natural history of our maladies to their philosophy.

I believe it is rarely found that in one mind are combined in an eminent degree the faculty of accurate observation of minute details and that of deducing great general principles or laws in science; in fact, the union of analytical and synthetical mental powers. This combination existed in an extraordinary degree in Marshall Hall.

I will now endeavour to trace the steps by which he was led to the greatest of his discoveries, that which, it is generally allowed, entitles him to rank with our distinguished countryman Harvey, the discoverer of the circulation of the blood.

About the latter part of 1830 he was occupied in an experimental research into the effects of loss of blood. These experiments were witnessed by the late Dr. Hope, Mr. Field, and some other friends. The results were considered to be deeply interesting and entirely confirmatory of the views which he had previously published. They were detailed in a paper read at the Royal Medical and Chirurgical Society, and printed in its Transactions.* From this he went on to an investigation of the circulation of the blood in the minute and capillary vessels. These researches were embodied in three papers, entitled severally—1, "A Critical and Experimental Essay on the Circulation of the Blood:" 2, "On the Anatomy and

* Vol. xx.

Physiology of the Minute and Capillary Vessels," read at the Royal Society, April 28th, 1831 : and 3, "On the Effect of Water raised to Temperatures moderately higher than that of the Atmosphere, upon Batrachian Reptiles," which was also read at the Royal Society, May 5th, 1831. These papers afterwards formed a volume entitled "A Critical and Experimental Essay on the Circulation of the Blood."

Whilst this work was going through the press, an unfortunate accident happened to a portion of the manuscript. His friends Messrs. Seeley and Burnside had agreed to publish it, and the manuscript was from time to time sent by a "stage-coach" to their printer at Thames Ditton. On the evening of the Coronation of William the Fourth, great crowds having collected in the streets to see the illuminations, the packet of papers was stolen from the pocket of the coach and was never again heard of! This was a great loss, as it was the only copy of a long series of careful and important experiments. My husband bore it with perfect equanimity and truly Newtonian philosophy, and immediately set to work to repair the loss, so far as that was possible, by repeating the experiments and detailing their results. The progress of this investigation was occasionally witnessed by Dr. Watson, who took a deep interest in it, and who always generously acknowledged the value and originality of my husband's labours when it was the fashion in some quarters to endeavour to throw discredit upon them. I here allude more particularly to those of his discoveries which will be mentioned in

the next chapter. In a note to my husband, dated Oct. 25th, 1831, Dr. Watson says:—

I am extremely sorry that I shall not be able to be present at the continuance of your very interesting observations to-morrow evening. I trust that you will permit me again to be a spectator of the circulation, after my return to London, in case your investigations should then be going on. I have never been more gratified and interested by any physiological inquiry in my life than I was by what you were kind enough to show me last night.

The investigation alluded to by Dr. Watson is thus described by my husband himself in the memoranda dictated shortly before his death:—

My first ambition was to become a Fellow of the Royal Society. With this object I adopted what I believe to be the legitimate course—I took up a subject of scientific inquiry, purposing to prepare a paper or papers to be read at the Society.

My first subject was the Circulation of the Blood. I proposed to trace the anatomy and physiology of the vessels placed between the last terminations of the arteries and the first beginnings of the veins more distinctly than had been done before. I chose the batrachia as the subjects of my experiments, and traced, under the microscope, the circulation in the minute vessels placed intermediately between the arteries and veins, both in regard to their anatomy and their physiology.

I soon discovered that these vessels are not only extremely minute and *capillary*, but totally distinct, both from the artery whence they arise, and the vein whither they tend. The characteristic of the artery is to divide continually into minuter branches; whilst that of the vein is to unite continually into larger trunks. The characteristic of the intermediate vessels is to preserve a uniform diameter. The artery and the vein are obviously *vessels;* the intermediate vessels

are apparently rather channels than vessels. The arteries and the veins are mere machinery for conveying and reconveying the blood; the intermediate blood-channels serve the office of bringing the fluid blood into contact with the material tissues of the system; and here all the blood-changes, and all nutrition and absorption of the material tissues are effected. I have termed them, therefore, methæmata, or methæmatous blood-*channels.**

My next object was to trace the different forms of the methæmata in the different parts and tissues of the animal economy; but I particularly traced their forms in the pulmonary apparatus. The circulation of the blood in the vesicular lung of the triton, and in the cellular lung of the frog and of the toad, presents one of the most beautiful scenes the eyes of man ever beheld or can behold. It is a flood of silver, or of gold, according as we see it by the white light of day or the yellow light of the lamp.

I had the special course of these methæmata drawn and lithographed; the portrait was beautiful, the physiological interest admirable. The pulmonary methæmata were obviously devised for diffusing the blood over the greatest possible surface, and for exposing it most perfectly to the influence of the atmospheric air.

My paper was read at the Royal Society, and refused a place in its Transactions.†

The great Müller said of my paper and its illustrations, that

* The late Mr. Bransby Cooper was much interested in my husband's investigations on this subject, and visited him several evenings, in order to acquaint himself thoroughly with the results. When they came into the drawing-room for tea, after some microscopic observations, I well remember my husband's furnishing Mr. B. Cooper with some aphoristic characteristics of the blood-vessels, for his lectures: "The arteries divide, divide, divide; the capillaries divide, unite, divide, unite; the veins unite, unite, unite," &c. Mr. Bransby Cooper was delighted with this, and said, "I shall tell that to my pupils in my next lecture."

† In his "Letter to the Earl of Rosse," in 1848, Dr. M. Hall says, of this paper:—"It was rejected, and replaced by what I venture to designate, after the lapse of seventeen years, as utter error, by *a member of the Council.*"

ey were of "ausserordentliche Interesse"—of extraordinary interest.

I believe the discovery of the true methæmatous blood-channels to be mine; it is given to me, at least, by a learned and laborious German physiologist, M. Josephus Berres, who has minutely treated of this subject, designating these channels "*systema vasorum intermedium.*" I rather designate it "the system of the methæmatous, or blood-changing channels;" for in these channels all the atomic chemical changes in the animal economy, whether in the lungs or in the general system, take place; the arteries, the heart, and the veins being, as I have stated, the mere machinery to convey the blood to and from these channels."*

The enthusiastic language of the above description shows the warm admiration with which my husband regarded these phenomena—an enthusiasm and an admiration which had suffered no diminution from the lapse of time, and from the depressing influence of that fatal malady which confined him to his bed at the time he dictated it. How well do I remember the deep interest with which he contemplated these wondrous microscopic phenomena in 1831! Sometimes, when they were unusually splendid, he would call me, in all haste, to come and witness them. In particular, the circulation in the lung of the toad displays a most marvellous scene, which can never be effaced from the memory of those who have beheld it.

About the time of completing his essay on the "Circulation of the Blood,"† he entered upon another

* Just as, to use a simile of my son's, in irrigating a meadow from a river, the water may be conducted into a system of small channels, which afterwards re-unite to carry it away.—C. H.

† "A Critical and Experimental Essay on the Circulation of the

very interesting and original investigation, the results of which formed a paper entitled, "On the Inverse Ratio which subsists between the Respiration and Irritability in the Animal Kingdom."

It has been said that—

The law of life unfolded in this paper is of the most comprehensive kind, and is true at once of the different species, stages, and forms of animated nature. It has been still further generalized into the axiom—"*The vital dynamics are inversely as the vital stimuli.*" From the various combinations of these, the different forms and modes of life arise —from the rapid summer whirl to the winter sleep of the bat, from the flight of the bird to the crawl of the reptile.

This paper was read at the Royal Society on the 23rd of February, 1832, and was published in the "Philosophical Transactions." It has recently been spoken of as "one of the most beautiful examples that we know of widely extended observation and previously disjointed facts, all brought together and rendered harmonious by the insight and genius of a master-mind."*

M. Flourens, the distinguished successor of Cuvier, spoke of this "Law of life" as follows :—

La loi qui, dans les différentes espèces, règle le rapport de la respiration et de l'irritabilité, est une des premières bases de toute la physiologie comparée. Or cette loi n'était pas encore nettement posée. Il fallait beaucoup de sagacité pour arriver, comme l'a fait M. Marshall Hall, à la poser d'une manière plus précise; il en fallait même beaucoup pour

Blood, especially as observed in the Minute and Capillary Vessels of the Batrachia and of Fishes." Sherwood and Co. 1832.

* *Medical Times and Gazette* for Aug. 29th, 1857, p. 227.

s'apercevoir qu'elle l'était mal. Au reste, cette sagacité ingénieuse est, si je puis ainsi dire, le ressort actif de tous les travaux de M. Marshall Hall ; elle brille dans cet écrit que je viens d'examiner, dans son ouvrage sur la *Circulation du Sang dans les Vaisseaux Capillaires des Reptiles et des Poissons*, dans une foule d'expériences, &c. &c.*

In order to perform the experiments required for this investigation, measuring the quantity of the respiration in different animals, Marshall Hall himself devised a Pneumatometer — a very ingenious apparatus, a drawing and description of which were also published in the "Philosophical Transactions."

He never ceased to regard the subject with extreme interest, further research confirming the accuracy and truth of his views. He also perceived that it was capable of great extension; and he sometimes meditated pursuing it still farther, and writing a work upon it. Twenty-one years after the publication of the paper alluded to, he delivered a lecture upon this "Law of Life" ("Zoonomia") at Washington, in March, 1853, during his visit to the United States. This lecture was published in an American Journal and in the *Lancet*, and was afterwards reprinted in his last work, on "Prone and Postural Respiration."

The above subject led to his investigations in regard to hibernation. After many experiments and much careful observation, he wrote a most interesting paper, containing original views, on this subject. It was read at the Royal Society, on the 1st and the 8th of March, 1832, and was printed in the "Phi-

* *Journal des Savans* for November, 1838, p. 664.

losophical Transactions." The curious little apparatus which he devised for ascertaining the temperature of the bat without disturbing its winter sleep, was well adapted to its purpose, and has been preserved.

The animals required for all these investigations formed a little ménagerie in a room of our house devoted to that special purpose. There were assembled mice, hedgehogs, bats, birds, fishes, frogs, toads, tritons, snakes, &c. Perhaps some of my readers may think the collection not a very choice one; but they were subservient to useful scientific purposes, were well cared for, and humanely treated.

The "Memoranda" are thus continued:—

> I pursued my career of practice during the day, and of science during each evening. In the latter occupation I had the inestimable advantage of the constant assistance of my dear and lamented friend Mr. Henry Smith, of Torrington Square. I never knew a person so accurate in his information, and so devoid of selfishness. His interest in my researches never flagged. He was true to his appointments as the clock itself. I shall ever honour his memory and deplore his loss.

Marshall Hall devised the experiments, and Mr. Smith assisted in their performance with admirable dexterity. The one furnished the head, the other the hands. Though often pressed by my husband to do so, Mr. Smith never would write anything; he had a dislike to writing, and, as he modestly said, an inaptitude for it. But he took great delight in assisting in any scientific investigation, and I believe some of his happiest hours were spent at our house in experiments

and microscopic observations. He afterwards became afflicted with an incurable malady, and died in 1851.

On the 5th of April, 1832, having presented several papers to the Royal Society, Marshall Hall was, by a large majority, elected a Fellow of that body. On this occasion, his Royal Highness the Duke of Sussex, then President of the Society, in addressing him, observed that, "Whilst he was honoured by becoming a Fellow, the Society was honoured in numbering him among its Fellows."

With Marshall Hall science always went hand in hand with practical medicine. While thus pursuing physiology, he was still intent upon the study of human disease. In 1831 he proposed a new mode of removing vascular nævus, by a very safe, simple, and bloodless operation. This was repeatedly performed under his direction with perfect success, and it has, I believe, never failed, when pursued in strict accordance with the rules which he laid down.* He also made a suggestion, in regard to another surgical operation, which was successfully performed by Mr. G. O. (afterwards Dr.) Heming.†

In 1832 he resumed his investigation of "The Effects of Loss of Blood," and presented a paper on that subject to the Medical and Chirurgical Society, which was published in its Transactions.‡

His microscopic observations relative to the circu-

* See *Medical Gazette* for 1831, Feb. 26th, p. 677, and Dec. 10th, p. 353.
† Ibid. for Nov. 26th, 1831, p. 269 (Operation for Prolapsus).
‡ Transactions, vol. xx. p. 250.

lation had thrown great light upon inflammation, which he accurately traced from its incipient stage. The effect of *shock* upon the circulation was also placed by him in a clear light.

In the same year he published some papers on "Bronchial Affections in Children,"* and some further "Essays on Diagnosis;"† besides contributing to the "Cyclopædia of Practical Medicine" the articles "Abstinence," "Anæmia," "Morbid States of the Blood," "Blood-letting," "Chlorosis," and "Symptomatology."

I think the reader will allow that Marshall Hall's first six years in London were not idly spent, since they produced all the works enumerated in this chapter.

Medical Gazette for Jan. 14th, 1832, p. 578.
† Ibid. pp. 593, 625, 721, 753.

CHAPTER IV.

DISCOVERY AND OPPOSITION.

There is no vice of which a man can be guilty, no meanness, no shabbiness, no unkindness, which excites so much indignation among his contemporaries, friends, and neighbours, as his success. This is the one unpardonable crime which reason cannot defend nor humility mitigate.

"When Heaven with such parts has blest him,
Have I not reason to detest him?"

is a genuine and natural expression of the vulgar human mind. The man who writes as we cannot write, who speaks as we cannot speak, who labours as we cannot labour, and thrives as we cannot thrive, has accumulated in his own person all the offences of which a man can be guilty. Down with him!—why cumbereth he the ground?—*The Times*, Oct. 9th, 1858 (leading article).

We now arrive at the period when Marshall Hall made his most important discovery in physiology—that of the Diastaltic Spinal System.

In the preceding chapter I have mentioned his investigations relative to the circulation of the blood in the minute and capillary vessels. The following quotations from memoranda, dictated by him twenty-five years afterwards, and during his last illness, furnish a graphic account of the accidental manner in which he was led to another inquiry, whilst examining the pneumonic circulation in the Triton.

It was during the course of this investigation that I was struck with the fact which led to the discovery of the Spinal System.

The decapitated triton lay on the table. I divided it between the anterior and posterior extremities, and I separated the tail. I now touched the external integument with the point of a needle; it moved with energy, assuming various curvilinear forms! What was the nature of this phenomenon? I had not touched a muscle; I had not touched a muscular nerve; I had not touched the spinal marrow. I had touched a cutaneous nerve. That the influence of this touch was exerted through the spinal marrow was demonstrated by the fact that the phenomenon ceased when the spinal marrow was destroyed. It was obvious that the same influence was reflected along the muscular nerve to the muscles, for the phenomenon again ceased when these nerves were divided. And thus we had the most perfect evidence of a reflex, or diastaltic, or diacentric action. From that day to this I have not ceased to pursue the subject in all its phases—physiological, pathological, and therapeutic!

The result has been the discovery and the development of the Spinal System. I will not venture to state what rank this discovery will hereafter take in physiology.

I pursued my career of investigation into the Spinal System during nearly a quarter of a century.

In its principle of action, its physiology, pathology, and therapeutical applications, it has proved a guide to me during my long subsequent researches into the phenomena and treatment of that *herculean* disease, epilepsy.

In a subsequent portion of this volume the nature of this discovery will be unfolded. My task embraces only a record of the events. The following paragraph, written in 1850, very justly describes the earnestness with which my husband continued, after the first discovery, to pursue the subject:—

No day, scarcely an hour, has elapsed since that eventful

occurrence, in which Dr. Hall's attention has not been more or less turned to the subject; and he himself has recently said, that in the long interval of nearly twenty years, he has devoted to it not fewer than 25,000 *leisure* hours! and that if the hours devoted to the same subject in *practice*, in relation to diagnosis and pathology, be reckoned, that number ought at least to be doubled.* The acuteness which seized the first fact, and the indomitable perseverance which traced it to its *cause*, and to its *results*, are alike remarkable, and constitute the true genius for discovery. We well remember the enthusiasm with which our friend announced to us the first fact in the chain of his discoveries, and his frequently exclaiming, "I will never rest till I have found all this out, and made it clear!" †

The first publication of this discovery appeared in the "Proceedings of the Committee of Science of the Zoological Society," the paper having been read Nov. 27th, 1832.‡ My husband then embodied his views in a paper on "The Reflex Function of the Medulla Oblongata and Medulla Spinalis," which was read at the Royal Society, June 20th, 1833, and was printed in the "Philosophical Transactions" of that year. The immense scientific and practical value of this discovery is now, I believe I may truly say, universally acknowledged; but it will not be without interest to the reader

* If we add the time devoted to it during the seven years subsequent to the period when the above was written, I believe the number may be honestly stated at 35,000; for, to the end of his life, he never ceased to continue its development.—C. H.

† The subject is thus pursued by the same pen:—"The nature of the acts by which we breathe and take our necessary food, the nature of all the acts of ingestion and egestion, the nature of a thousand morbid actions constituting the class of spasmodic and paroxysmal diseases, was previously altogether unknown."—See the *Lancet* for July 27th, 1850, pp. 124, 125.

‡ "Proceedings," part ii. p. 190.

to trace its reception in this country and elsewhere. In Germany his paper was immediately translated and inserted in the "Archiv" of Professor Müller. But in England, with certain exceptions, it was treated with contumely, its author being "the object of obloquy, and denounced as the propagator of absurd and idle theories." In 1837 he presented a second paper, on the same subject, to the Royal Society. It was entitled "On the True Spinal Marrow and the Excito-Motor System of Nerves." It has since been said:—

> The *first* memoir had sketched the outlines of a great fact, or rather, a series of facts, and it promised further research. The *second* supplied many of the strokes and tints still wanting to fill up the picture. It was of vast importance, as showing, for the first time, the real classification and distribution of the entire nervous system; not, as heretofore, into *two* great classes, but into *three*. Here was unfolded the tangled web which had confounded and puzzled previous physiologists. All which had been dark and misty before, was now destined to become clear as noon-day. It likewise contained the *first practical applications* of this great discovery.*

Yet the truth of history compels me to state that this paper was refused a place in the records of British Science by the Society instituted expressly for the "Promotion of Natural Knowledge;" in short, it was *rejected* by the Council of the Royal Society! In a note addressed to the Members of the Council at that period, Marshall Hall himself said:—

* See biography in *Lancet* for July 27th, 1850.

I beg, Gentlemen, that you will do me the favour to appoint a commission to witness my experiments, to examine my plain deductions from them, and to look over my Paper with care, before you finally condemn my labours.—In conclusion, he adds:—I think I have some reason to complain of the treatment of my Paper whilst before the Council. Having quoted from Whytt an experiment of Redi, on the movements of the *Tortoise* when deprived of its head, some one has written—"Will they live after they are made soup of?" Such an observation needs no remark from *me*. It is rather an indignity put upon the Royal Society itself.

His entreaty that his experiments might be witnessed was unheeded, and his expostulation treated with contemptuous silence. I may add that the official abstract of this paper contained misrepresentations.

Such was the importance which Marshall Hall attached to his discovery, and so great was his enthusiasm in the pursuit of the investigation, that he had even proposed to withdraw from practice, and to sacrifice five years of his life and professional career, in order to devote himself to the subject without interruption* This proposal had been communicated to the Council of the Royal Society by Mr. Lawrence, one of its number, though absent when it was determined to reject the paper.

The greater portion of the medical press waged furious war against the discovery. *One* number of a quarterly periodical contained no fewer than *four* separate articles against it. Had it not been lamentable, it would have been amusing, to observe how it

* I well remember that at this period he seriously contemplated spending some years at Vienna, where he could have enjoyed great facilities for prosecuting the subject.

was assailed on entirely opposite grounds. One elaborate article, whilst admitting its *truth*, was directed against its *originality;* whilst another censured an author (Mr. F. LeGros Clark) for adopting these "*new*" views, which were anything but *true;* protesting against them in the strongest terms, and warning students against the reception of them.* Thus in one page it was *true* but *not new;* whilst in another it was *new* but *not true*, and good for nothing! It has been justly observed that, "If a discovery be made, its truth and importance are first questioned; and should these be established, then its originality becomes a subject of dispute." But such was the eagerness of the critics to find Marshall Hall wrong, that these opposite charges were both brought against him at once by different writers. Attacks were so perseveringly continued in one journal that, I believe, not a single number of it was published during a series of years which did not contain some adverse article, and often more than one. Every progressive step in the inquiry was disputed; everything great attenuated and depreciated. In one instance, calumnies proceeded from a quarter in which gratitude alone ought to have existed, and they could only be attributed to "that dislike which ill-conditioned minds feel towards those from whom they have received benefits."†

* "WE protest in *the strongest manner* against the introduction into this work of certain physiological views," &c., &c.—See a Quarterly Medical Journal.

† It was thus that Sir Isaac Newton was treated:—"And if I was kind to him in that, he is very disingenuous to turn it to my disad-

It would be difficult to convey to the mind of one who had not closely watched it, any idea of the extent and the long persistence of the opposition which threatened to stifle the discovery. Those alone who have undergone a similar persecution will be able fully to comprehend it. There appeared to be an undercurrent of jealousy working against him in a thousand different directions and forms. Ancient works were disinterred in the vain hope of robbing him of his originality. "Complete Anticipations" were exultingly announced. On the one hand, he was accused of stealing his ideas from old writers; on the other, contemporaries started up and claimed the discovery as *theirs;* whilst some combated its truth, and never ceased cavilling. All this opposition, and a great deal more, which it would be useless to detail, extended over a very long series of years, and, on the part of the inimical journal already alluded to, ceased only when the journal itself, by a sort of retributive justice, ceased to exist. These facts are notorious, and will ever remain associated with what is now considered the greatest physiological discovery of the age. I possess an interesting document—the recollections of a conversation which took place between the late distinguished Dr. Prout and Dr. Thomas Williams of Swansea, the latter having written it immediately after its occurrence.

Having discussed the subject of Dr. Prout's own valuable labours, which, like my husband's, had been

vantage. For this is to snap me by the fingers for giving him bread." —See "Life of Newton," by Sir David Brewster. 8vo edit.

ignominiously treated by Reviewers, Dr. Williams observed:—

Look at the case of Dr. Marshall Hall. Who has laboured more energetically, more successfully? And who has been more abused, opposed, and discouraged than he?

Dr. PROUT: "Dr. Hall is a *wonderful* man. I knew him very well when I was a student at Edinburgh. His early education had been neglected, so that he had more than ordinary difficulties to contend with; but he was, I well recollect, remarkably energetic and persevering. I said then, that, if that state of mind continued to fire him through life, he would certainly become a great man."

Dr. W.: "What do you think, Dr. Prout, of the views of Dr. Marshall Hall on the nervous system?"

Dr. P.: "I think them *very important indeed.* I have always said from the beginning that the facts brought to light by Dr. Hall's experiments *must* be true. I always thought they had the *stamp* of *truth* about them. His discoveries are the most important that have *ever been made* in medicine, especially those relating to the spinal cord. I think the phenomena connected with the functions of the nervous system which Dr. Hall has developed by his extraordinarily acute researches, have rendered the practice of physic *more exact*—I mean, more like a *true* SCIENCE—than anything that has *ever been done* in medicine. In the *next* age it will be admitted as the greatest disgrace of *this*, that such a man as Dr. Hall, when warm, enthusiastic, and devoted to science, was worried, opposed, and irritated by captious opposition to everything that he did and said; but, I am glad to say, not driven, wearied and disgusted, from the pursuit of science."

Dr. W.: "I have heard Dr. Hall say that he was sorry he had not been brought more into contact with you, Dr. Prout."

Dr. P.: "I should be very proud to know more of such a man as Dr. Hall; but I don't know how it is, we are always busy when we meet."

After a lapse of twenty-three years from the first

promulgation of the Spinal System, the *Edinburgh Monthly Journal of Medicine* made the following remarks:—

Dr. Marshall Hall has been accused, first, of having merely given to the sympathetic actions of Whytt a new name; and secondly, of having borrowed all his ideas from Unzer and Prochaska. It would occupy far too much time to enter into the history of these discussions. They were almost entirely carried on by a journal which, from first to last, attacked Dr. Hall with a pertinacity truly remarkable, and raked up incomprehensible passages from Unzer and Prochaska, in order to diminish his just title to the establishment of the reflex function of the spinal cord, in a way anything but creditable to the medical literature of this country. The controversy, however, led to the translation of the works of Unzer and Prochaska into English, for the Sydenham Society. The result seems to have been that all these attacks have ceased, and that the merit of Marshall Hall with regard to the important theory of reflex nervous actions, is now universally acknowledged.

I now return to my husband's own retrospective memoranda:—

My days in London were spent in active practice; my evenings, sometimes far into night, in laborious experimental physiological inquiry. I thus wrote my various papers on the "Spinal System." I went from experiment to my writing. I think these papers bear the impress of the freshness of the facts and of the caution manifested in my inferences. I have never had a paragraph or an opinion to recall. This is my reward—the reward of truth!

I have stated that I took up my abode in London in the year 1826, and I can truly say with Sallust, "Ibi mihi multæ adversæ fuere." I have spoken of the rejection of my second

For March, 1855, p. 233.

paper on the Nervous System at the Royal Society; yet every one now knows the station which the Spinal System has taken in physiology and in the ranks of physiological discovery. Of course my contributions on this subject were not admitted for competition for the Royal Medal awarded for the paper or papers which had made the most marked advance in this department of science. A few years afterwards they were, however, recommended for the Copley Medal by the Physiological Committee of the Society. I prophesied that this recommendation would be rejected by the Council; and it was so.

Quarter after quarter, derogatory attacks appeared on my various publications on this subject [the Spinal System]. I can truly say that, as I never wrote an incautious paragraph, and consequently, never had a paragraph to retract, so I never derived the slightest assistance from these long-continued criticisms. The issue of all this is, that the Spinal System remains unscathed and at once established on a rock, in itself, and of daily increasing utility in the science and practice of medicine; whilst the attacks of my enemy, a monument of envy and detraction.

The "Transactions of the Royal Society" being closed against his investigations, Marshall Hall was obliged to seek other channels for their diffusion; and for this purpose he had to resort to a foreign country. In a letter addressed to Sir John Herschel, May 3rd, 1840, he says:—

I have resolved finally to write [my investigations in] a series of letters to Professor J. Müller, of Berlin. He has kindly acceded to the proposition, and they will be inserted in his "Archiv." I sent the first of the series through the Prussian Minister on Tuesday last.

At length, in 1847, *ten years* after the rejection of his last paper, thinking that the temper of the

Council of the Royal Society towards him might have undergone some change in that long interval, my husband very amiably presented them with another paper. I quote his own words explanatory of its subject:—

It was a paper containing the detail of many experiments of the utmost difficulty and nicety; experiments relating to the influence of galvanism—first, on muscular nerves; secondly, on the spinal marrow; and thirdly, on incident nerves; experiments, two thirds of which, I believe, no one *could* perform but myself, and which no one certainly ever had performed; experiments of great value to pathology, but of which my judges do and can know nothing; experiments, finally, of which no one could judge without witnessing them. Yet were these experiments rejected *unwitnessed!*

I need scarcely add that he never again offered any of his investigations to that learned body. I refrain from entering into further details; these were very briefly stated in a privately printed letter which he addressed, in 1848, to the Earl of Rosse, then President of the Royal Society. It is to be presumed that this letter was approved of; as, in 1850, his name was, for the first time during the preceding eighteen years of his Fellowship, placed on the Council. In a manuscript, written at a late period of his life, and containing the history of the events to which I have here so slightly alluded, he says:—

This brief detail is destined for a remote posterity; may it deter future writers and actors from an evil course? My labours have remained unhonoured and unrewarded, at least by that Society whose noble object and office it is—or ought to be—to "promote natural science."

In closing this very brief sketch of his relations with the Royal Society, I will only allude to the fact that, although during that long period—a quarter of a century—he was, according to the general opinion, the most original, laborious, and successful cultivator of his department of science amongst all the Fellows, yet *he never received from the Society any honour or reward,* although many were, of course, conferred during that time.

In a letter which I have recently received from a gentleman of great ability and of high position in science, the following observations are made in regard to the historical view of these discouragements :—

> There existed a most powerful opposition to overcome, not only from individuals but from institutions, which opposition I conceive could be shown to have at length furthered the cause of truth, and instead of humbling, to have assisted in raising the object of it in the opinion of scientific minds. Such, in all ages, has been the course of successful genius and discovery, which, however mortifying at the time, seems by an inevitable law to work for good.

Another writer thus justly alludes to this opposition :—

> Marshall Hall was a man whose simplicity of character, originality of genius, and indefatigable labours in the cause of his profession, justly entitle him to be regarded as one of the greatest benefactors of his time. No man ever attained to eminence, and justly achieved it, against a more formidable or more energetic opposition. His life was a long struggle against ignorant and interested opponents.

The jealousy, and consequent animosity, excited by any kind of distinction, is so well known and so uni-

versally acknowledged, that I need scarcely refer to it. But perhaps the distinction of having made an important *discovery* in science is that which most of all exposes a man to every annoyance.

> He who ascends to mountain tops, shall find
> The loftiest peaks most wrapt in clouds and snow;
> He who surpasses or subdues mankind,
> Must look down on the hate of those below.
> Though high above the sun of glory glow,
> And far beneath the earth and ocean spread,
> Round him are icy rocks, and loudly blow
> Contending tempests on his naked head,
> And thus reward the toils which to those summits led

Sir David Brewster, in his interesting biography of Sir Isaac Newton, admirably describes the troubled waters through which a discoverer has to wade:—"Great truths," he observes, "have never been received with implicit submission." "In every age and every state of society, the newest and the highest must undergo more than one ordeal—the ordeal of the ignorant, whose capacity they transcend—the ordeal of philosophy, by which they are to be tested and confirmed, and the ordeal of personal jealousy and rival schools, by which they are to be misrepresented and condemned."† Newton's gentle nature so dreaded the contest evoked by his discoveries, that "but for the importunities of his friends, his most important researches would have been withheld from the world." He wrote to Leibnitz: "I was so persecuted with discussions arising from the publication of my theory of light, that I blamed my own imprudence for parting with so substantial a blessing as my quiet to run after a shadow."

* "Childe Harold," canto iii.
† Edit. 1855, chap. xiv.

Copernicus so well knew the opposition which his discoveries would excite, that he shrank from publishing them.

Harvey's discovery of the circulation of the blood was received with ridicule. For some time he received nothing but contumely and abuse. His practice and his friends fell away, and it was not till after a quarter of a century that the truth of his discovery was generally recognised. When, in the decline of life, he was pressed by Ente to give to the world his later investigations, he declined, saying, "You know full well what a *storm* my former lucubrations raised."

Jenner encountered still more hostility, on the promulgation of his beneficent discovery of vaccination.

In our own day, we have heard of "the *battle* which George Stephenson fought for the locomotive." "The leading engineers were against him without exception."[1]

Marshall Hall had also to endure the pitiless pelting of the "storm," and to encounter the "battle" in which every missile which envy and jealousy could forge was hurled at him.

When his writings were misrepresented, and when he was accused of "suppression of facts" and of plagiarism, how were such imputations to be met? Was the stain of dishonour to rest upon the name of Marshall Hall without an effort to vindicate his integrity? And was he to allow distortions of his views to remain without rectification? He indignantly disproved the dishonourable conduct imputed to him,

[1] Smiles's "Life of George Stephenson."

and corrected the misrepresentations. And because he did so, he was derided as "thin-skinned," and blamed as "irritable!" He had an abhorrence of all injustice, whatever its form, and whoever its subject; whilst he had an intense love of truth. His courage was indomitable, and he detested sneaking and skulking. I cannot conceive that a man with a noble mind and an upright heart should be otherwise than indignant at imputations such as those to which I have alluded. Had my husband been of an obtuse, apathetic temperament, he would, of course, have been less alive to them; but he was of a very sensitive nature. He possessed those acute feelings so usually associated with genius and with a warm, generous disposition, and so keenly did he feel the injustice with which he was treated, that he sometimes said to his friends—"If you value your peace, do not make a discovery." In his "New Memoir," he wrote:—

> Every encouragement should be given to the diligent and devoted investigator; every obstacle, every kind of injustice, every source of disgust and of indignation should, for the sake of science, for the honour of our institutions, be removed. The physician who devotes himself to investigation, especially, makes a thousand sacrifices; his path requires cheering, and should not, as it need not, be unjustly obstructed or beset with thorns.

When it was suggested that he should not notice certain hostile writings which appeared, his reply was, "It would not be *truthful* in me; and why should I fear to declare the truth?" His straightforwardness

"New Memoir," p. 94.

of character impelled him, when a mis-statement appeared, to correct it, whether it concerned himself or another. He was not withheld by the consideration whether this honest mode of procedure was politic, otherwise he might have sheltered himself in silence. His courage, too, was unflinching, and he quailed before no persecution.

In the midst of the long-continued opposition which he encountered at every step of his scientific course, he never relaxed in the zeal and energy with which he pursued his important investigations; he never faltered for a moment; no doubt ever threw its shadow across his clear mind. On the 20th of June, 1840, he wrote—"Of one thing I am as confident as of anything human—that my labours will be remembered centuries after all this futile opposition is forgotten." Among his manuscripts I find also these words: "I appeal from the *first* half of the nineteenth century to the *second*." "Such men," says a reflective author, "anticipate their contemporaries; they know they are creators long before they are hailed as such by the tardy consent of the public. These men stand on Pisgah heights, and for them the sun shines on a land which none yet view but themselves."[1]

With such certainty and clearness [illegible] husband see the facts which he had so laboriously and accurately worked out for himself, that, when almost all in this country joined in the hue and cry against his "new" or his "untrue" views, and I once said to him, "Do you not think you *may* be mistaken?" his reply

[1] See "The Literary Character," by I. D'Israeli, 5th edit. p. 226.

was, "I am as certain of the truth of what I have advanced, as I am of my own existence."

Controversy was forced upon him in sheer self-defence. It was very distasteful to him, and he *longed* for peace and quiet. Though he defended himself, he never made an attack, never wrote an anonymous unfavourable review, never gave a black-ball at any society, but often put himself to inconvenience for the purpose of giving a favourable vote. Nothing delighted his benevolent heart more than to praise others, when he could conscientiously do so; and never can I forget the sparkle of his eye and his pleasant smile when he had written something in favour of any professional brother.

One thing is remarkable; in the midst of his indignation at calumnies, and his annoyance from constant opposition, misrepresentation, and ingratitude, his *temper* was never affected. This I can most unhesitatingly affirm, and it is a fact which forcibly struck our most intimate friends. Some men would have been soured and rendered morose by so long a series of provocations; but his constant kindness and amiability towards all around him were undisturbed by these trials. No petulance, no gloominess, manifested that he had been annoyed and even pained. The only sign which betokened to me that a fresh attack had been made upon him, was a little thoughtfulness and abstraction, and an unusual devotion to his writing. For this he would awake in the night, light his candle, and write in bed, with evident anxiety and wonderful rapidity. When he had completed his reply,

and not till then, he showed me the attack and his defence together.

I now conclude this inadequate sketch of the opposition which followed the discovery of the Diastaltic Nervous System. Let not the painful history deter any from aspiring to a similar noble course. Notwithstanding the many bitter annoyances which are probably inseparable from a great and beneficent career, it is self-rewarding, in the consciousness of noble and useful achievement. The honest labourer in the field of truth enjoys an internal satisfaction which no Royal Society medals or laudatory reviews can bestow, nor envious detraction take away. I speak from what I have seen and known. Marshall Hall was a happy man. He delighted in investigation for its own sake, because he loved and admired truth; whilst the reflexion that from his researches he had deduced results of immense benefit to mankind, diffused over his mind a glow of inexpressible pleasure and constant cheerfulness. *In his own country no honours were ever conferred upon him;* but, although he felt this injustice, he had a firm conviction that the value of his discoveries would one day be recognised, and he was content.

His laborious career, thus pursued amidst the greatest discouragements, will command the admiration of future generations, furnishing a bright example to our youth; and England will point with pride to the name of Marshall Hall, and glory in claiming it as her own.

Among my husband's unpublished manuscripts I

have found the following, intended, apparently, to form the preface to one of his works; it may be not inopportunely inserted here.

PREFACE.

As there is nothing more beautiful in the intellectual world than truth, so there is nothing more admirable in the moral world than the love of truth. In it are comprised scientific probity and justice—probity in regard to facts, justice in regard to persons. Both are essential to the honour and well-being of scientific institutions and publications, and both are lamentably wanting in this our cherished country. In the following pages I propose to pursue the rules for investigations in physiology, formerly laid down by me in my "Essay on the Circulation of the Blood," one of which is—in quoting the opinions of authors, always to do so *in their own words*. Much misrepresentation, often quite unintentional, would be avoided by the adoption of this rule. It will also be right to leave such quotations to speak their own language, without adding to or subtracting from their real force and meaning. In this manner opinions will not be ascribed to authors which, in reality, they never expressed, and we shall avoid the error of finding "*complete* anticipations" of discoveries where there is *no* anticipation whatever.

With these rules, only one thing more is required—the love of truth, scientific probity, and justice in regard to facts and to persons.

Such are the principles by which I profess to have been guided in my recent investigations. [It is to be regretted that the remainder of this manuscript has not been found.]

CHAPTER V.

ENCOURAGEMENT.

AMIDST the storm which assailed the discoveries of Marshall Hall, a gleam of sunshine from time to time broke forth to warm and gladden his heart through the withering and chilling gloom of the medical atmosphere in England; and though the biting blast of calumny, and the pelting hailstorm of the critics, threatened the annihilation of the young plant of discovery, yet these were often followed by the cheering encouragement of some distinguished Continental physiologist. The tender nursling, thus cradled in the storm, grew hardy and vigorous, and struck its roots far and deep. It is perhaps to this fierce opposition that we partly owe that clear and perfect establishment of each point, step by step, in our author's doctrines, and that firm and perspicuous defence, so peculiarly his own.

A few months after the first publication of the "Excito-motor System," Professor Müller, of Berlin, one of the greatest physiologists of the day, announced nearly similar views, independently of my husband's. Either he had not seen the publication of the latter, or, having seen it, he had forgotten whence he derived

his ideas. He distinctly allowed the priority of Marshall Hall,* who, in adverting to this fact, says:—

I cannot conclude without expressing my admiration of the noble candour of Professor Müller, in his frank acknowledgment of the priority of my investigations and publications relative to the subject of these pages.†

The first memoir, "On the Reflex Function," &c., was immediately translated into German, and inserted in the "Archiv für Anatomie und Physiologie" of Professor Müller,‡ who likewise gave a very interesting notice of the subject, in his "Handbuch der Physiologie," speaking of it as "new," and as "a decided step in our science." It excited throughout Germany and in Holland great attention and interest.§ In France, M. Flourens, the distinguished

* See the "Handbuch der Physiologie," Ed. 3rd, 1838, t. i. p. 718. note.

† See the "New Memoir," by Marshall Hall, p. x. Baillière.

‡ For 1834, p. 347.

§ In a letter to Dr. M. Hall, dated Zwolle, October 14th, 1839, Dr. van Deen says, "Dass *Sie allein* der Entdecker der Reflexionsbewegung sind, davon habe ich immer die grösste Ueberzeugung gehabt, seitdem diese Entdeckung mir bekannt war, nämlich seit dem Sommer von 1834.

"Sie werden aus meiner spätern Abhandlungen sehen dass ich *nur Sie* dafür erkenne.

"In eine Abhandlung, die jetzt gedruckt wird, beweise ich dass Bell's Theorie erst recht durch die Lehre des Reflexionsbewegung erwiesen ist. Ihre Arbeit 'Memoirs on the Nervous System,' hat bei mir die lebhafteste Theilnahme erweckt, und ausführlicher Gebrauch habe ich davon gemacht."

Translation.

"That you alone are the discoverer of the Reflex function has always been my thorough conviction, ever since this discovery became known to me, namely, since the summer of 1834. You will see, from my recent works, that I acknowledge *you only* as the discoverer.

"In a treatise now in the press I demonstrate that the truth of Bell's theory is only proved by means of the doctrine of the reflex function. Your work, 'Memoirs on the Nervous System,' has excited my most lively interest, and I have made extensive use of it."

successor of Cuvier, mentioned it in his Lectures as "*a great epoch in physiology*," ranking the discovery of Marshall Hall with that of Harvey; whilst in a letter he said:—

Votre beau système des nerfs *excitateurs, incidents et réfléchis*, vous appartient bien, et comme grand fait spécial et déterminé, et comme vue d'un grand et nouvel ensemble de phénomènes.

The "Second Memoir," deemed by the Council of the Royal Society unworthy of publication in their Transactions, was also thus spoken of by this great physiologist:—

Cette sagacité ingénieuse est, si je puis ainsi dire, le ressort actif de tous les travaux de M. Marshall Hall; elle brille dans cet écrit que je viens d'examiner, dans son ouvrage sur la *Circulation du Sang dans les Vaisseaux Capillaires des Reptiles et des Poissons*, dans une foule d'expériences sur le système nerveux, et, plus encore peut-être, dans son dernier ouvrage sur les *Fonctions réflexes de la Moelle Épinière*, ouvrage de *l'ordre le plus élevé* en physiologie

The greatest generosity and fairness towards my husband ever marked the conduct of M. Flourens, exciting in the former the most lively gratitude.†

Journal des Savans for November, 1838, p. 664.

† The "New Memoir," by Marshall Hall, is thus dedicated:—"To Prof. Flourens, Member of the French Academy, Perpetual Secretary of the Institute of France, &c., &c., I dedicate this and my two former Memoirs, as to the philosopher who has, in his own admirable work, presented us with the most perfect model of physiological investigation; and who has, in his responsible office, displayed the most candid, impartial, and generous judgment of the works of others," &c. The "Aperçu du Système Spinal," one of the latest of the works of Marshall Hall, is also dedicated to M. Flourens, as a "Témoignage d'estime et d'admiration."

It may be imagined how encouraging were these acknowledgments from such high authorities, forming an agreeable contrast to the long persistence of the attempt to "write him down" in his own country. Although the English medical press, with one or two generous exceptions, to be presently noticed, opposed the new doctrines, or combated their originality, it is pleasant to add that the most philosophical among the profession gave a ready assent to both. Among those who publicly espoused and adopted them, I must first mention Mr. F. Le Gros Clark, Lecturer on Anatomy and Physiology at St. Thomas's Hospital. To this gentleman Dr. Marshall Hall thus alludes in his "Second Memoir:"—

I will take this opportunity of stating that *before* Professor Müller's sanction of my views was known in this country, Mr. Clark perceived and avowed their importance and novelty* with a candour which I would gladly see prevailing in every philosopher.†

Professor Faraday was so much struck with the philosophical beauty of the subject, that he gave a most interesting lecture on the newly discovered "Excito-motor System," at the Royal Institution, which was replete with his usual inimitable perspicuity.

Mr. Grainger not only accepted the doctrine, but pursued the investigation anatomically, which, in 1837, resulted in the publication of a work entitled "Observations upon the Structure and Functions of

* See "The Practical Anatomy and Elementary Physiology of the Nervous System," by F. Le Gros Clark, Esq.

† See "New Memoirs on the true Spinal Marrow and Excito-motory System of Nerves," p. 109.

the Spinal Cord." In a letter to my husband, dated April 3rd of the same year, this gentleman thus expressed himself:—"I am convinced *you* have discovered a *grand principle*, the greatest, I believe, that has *ever yet* been announced; and so I have publicly stated."

Sir Henry Holland made highly favourable allusions to the discovery and its extensive applications, in his "Medical Notes and Reflections"*—a work which Sir J. Herschel has characterized as "replete with profound philosophy." In a note addressed to Dr. Hall, Sir H. Holland says—"I am happy in believing that I was among the first in this country to recognise the value of your labours and discoveries."

Dr. Watson, in his admirable "Lectures," gave my husband all the credit of a most important discovery—a justice which the latter, a few years afterwards, thus acknowledged in the dedication to him of his "Essays on the Theory of Convulsive Diseases:"—

My dear Sir—You had the candour and the generosity early to applaud and encourage my labours in the nervous system; permit me, therefore, to inscribe these "Essays," a firstfruit of their application to practical medicine, with your distinguished name—distinguished no less in your academical than in your brilliant professional career, &c.

Among those who early acknowledged the truth and value of the discovery, I must not omit the name of Dr. Budd.

Dr. Sharpey, Professor of Physiology at University College, stated in his lectures:—

* See Op. cit. pp. 149, 324, 602, 1st Ed.

These facts have been witnessed and reasoned upon by previous physiologists; but to Dr. Marshall Hall belongs the credit of having fully shown their connexion with each other, of having first successfully generalized them, and of having given to this part of *physiology* the form of a consistent doctrine; and to him belongs exclusively the merit of applying a knowledge of these phenomena to *pathology;* and here, no less than in physiology, the application of the doctrine is of the highest interest and importance; indeed, as respects pathology, excepting the introduction of the stethoscope, which after all is perhaps not a fair subject of comparison, I can think of no single improvement which has taken place, since I began the study of medicine, equal to this, or so likely to prove fruitful in important results.

More recently, Dr. W. Tyler Smith has, I believe, most ably and successfully carried out Dr. Hall's views and suggestions as regards the application of his doctrines to obstetrics

At Edinburgh, whi[illegible]t a student, Dr. J. Hughes Bennett, now Professo[illegible] the Institutes of Medicine, and of Clinical Medicine, in that University, became the warm admirer, and has ever since remained the able and staunch advocate of the diastaltic spinal system. In a letter to myself he frankly and nobly says:—"You may depend upon it, my dear madam, that so long as I have the honour of teaching physiology and medicine, the great discoveries of Marshall Hall will never want a champion."

In enumerating the supporters of the doctrines of Marshall Hall, it would be most uniust and ungrateful

See Dr. M. Hall's "Synopsis of the Diastaltic Nervous System" [illegible]gmans, 1855, pp. 48-51), and Dr. W. Tyler Smith's work on Obstetrics.

to omit to acknowledge the undeviating adherence of the *Lancet*. While the medical press in general, as already stated, cavilled and opposed, the *Lancet* nobly upheld the discovery and its author. On some occasions, also, the *Medico-Chirurgical Quarterly Review*, conducted by the late Dr. Johnson, was its advocate.

Honorary diplomas now spontaneously poured in to our discoverer from the principal scientific societies of Europe and America, and soon his works were reprinted in the New World, and translated into the German, Dutch, and Italian languages. The estimation in which his name was held in Europe, as well as America, was greater than I can here describe. Of this I have had ample and most gratifying proofs from a variety of sources.

The following letter from the late amiable and talented Mr. Samuel Phillips† relates to a conversation which took place between him and the late Chevalier, afterwards Baron, Bunsen, during the period when the latter was Prussian Minister in England:—

Hastings, Oct. 24th, 1852.

My dear Mrs. Hall—Your wife-like question shall be faithfully answered.

Dr. Webster, of Dulwich, says, in a letter to me:—"Dr. Panchaud, a young Belgian physician, was lately introduced to me. I asked him which of our physiologists was most known and acknowledged in Brussels, and in Vienna, &c., where he had been travelling. His answer was—'Oh, *Marshall Hall first and most of all!* And Sir Charles Bell.' All honour to unprejudiced foreigners!!"

During one of our Swiss rambles we met, at Zermatt, with the Professor of Anatomy at the University of Hanover, who took great pride in the fact of his having been the first professor in Germany to teach the discoveries of Marshall Hall to his class, soon after their first publication.

† Author of the charming "Essays from the Times," and other works

The Chevalier, upon my mentioning your husband's name to him as that of the physician who had rendered me much service in respect of my health, said that Dr. Marshall Hall had the *very highest* reputation on the Continent, and that he was surprised to find that his fame was not equally extensive in his own country. It was a curious fact, he added, that when physicians of eminence came to England from Germany, they seemed to bring with them the notion that Dr. Hall was our most eminent practitioner, for they asked for introductions to him, and cared to be introduced to few others besides.—&c. &c., SAMUEL PHILLIPS.

The following letter from my friend Mrs. Collins corroborates this fact:—

My dear Mrs. Hall—Amongst the many recollections associated in my mind with your gifted husband is one which always appeared to me a striking proof of the veneration in which he was held in all parts of the world where his fame had gone forth. So widely spread was his reputation, that I never mentioned his name on the Continent, even to the humblest member of his profession, without a burst of enthusiasm on the part of my hearers.

The following incident, which occurred on our tour to Switzerland, I must recall to your mind. We were dining at the table-d'hôte of a Rhine steamer, and, our party being numerous and the accommodation very limited, we were obliged to separate. I sat by you, and a Dutch student on my other side, your dear husband being at the next table. In the course of conversation, we found that our neighbour was then studying a work of Dr. Marshall Hall's, which had been translated into Dutch, and he spoke of it as one of great celebrity and value. I told him that the lady next to me was the wife of the author of that work, and that the Doctor himself sat very near us. At this information the young man's countenance was lit up with delight. I shall never forget his enthusiasm. He laid down his knife and fork, arose from the table, and stood as if transfixed. I

immediately pointed out to him where the Doctor was seated, and then begged you to ask the latter to look round at him. He did so with his usual benevolent smile, which never forsook him, whether in pleasing moments like these, or when busy and hurried in his professional avocations. He then rose from the table and rewarded the young man's enthusiasm with a warm shake of the hand.

Since that incident I have been much in Germany, and could not fail to observe the enthusiastic admiration for the genius of your excellent husband. How often, in my acquaintance with physicians at Heidelberg, was I envied the happiness of my friendship with that great and good man! You have, indeed, the double solace of reflecting that his goodness equalled his greatness, and that he retained throughout life, even when his fame had risen to the highest, that humility of spirit which disdair ɔ enter into the feelings, thoughts, and pursuits (ıblest person, and to take pleasure in the simple jo... ...ld.

In reading over my journal of the charming tour to which I have alluded, I am reminded of a thousand acts of his kindness and goodness.—R. E. COLLINS.

I could add many such testimonies of the opinion entertained of my husband on the Continent; I will now, however, only quote the apt remark of Sir Humphry Davy, that—

We may generally discover how our labours will be appreciated eventually, from the opinion of contemporary foreigners, who, being unbiassed by circumstances of personality, will reduce every object to its just proportions and value.

In spite of the discountenance of the Royal Society, and a host of attacks and misrepresentations, the Spinal System and its discoverer, who fought his battle manfully, gradually made way even in this country. The discovery was not one unfruitful of

results; on the contrary, its author had, from the first, deduced from it the most important applications to practical medicine, and, as he developed the subject more and more, the immense extent of those applications, and consequently, of its utility, was, under the master-hand, wondrously manifested. Diseases, confessedly not hitherto understood, were now made plain by the light which these new views shed upon them. Enveloped in the obscurity of ignorance, many such disorders had been treated empirically and in the dark; whereas now, their locality and their causes being detected, they could be combated or guarded against by the intelligence of actual knowledge. It is, I believe, now generally admitted that no previous discovery in physiology has had such important and extensive *practical* applications. Its author constantly said that its ramifications were almost endless, and he continued to pursue them whilst life lasted.

It is perhaps rarely the case that the discoverer of a great fact in science is the person to apply it practically. Dr. Noble, in a letter to Marshall Hall, made the following remark:—"So far as I remember, you are the first physiologist who has himself applied his own discoveries extensively in practice."

It was observed by the late Mr. Davies, Mathematical Professor at the Military Academy of Woolwich, that—

> The mind that is capable of forming large views, is for the most part very desultory in searching after the minuter details of evidence in favour of, and invalidating the evidence apparently opposed to those views. The greatest of our

ordinary great minds are satisfied with enunciating a great truth (or what seems to them such), and leaving it to the "small fry" of philosophers to accumulate the evidences. Perhaps Newton alone, amongst physico-mathematical inquirers, originated a system and laboured to the end of a long life upon its details, gradually proceeding to the more and more minute. In this respect Newton's history is Marshall Hall's history. But the two men differ in this: the former had a life of general undisturbed leisure, whilst the other has had a busy and laborious professional course of duties to fulfil besides his philosophical research. . . . . History teaches by example, and his history will animate many a bright spirit yet—spirits that need cheering on their dreary path of neglect, envy, hatred, malice, and all uncharitableness.

In a short time Marshall Hall became everywhere the acknowledged authority on the subject of those multiform deranged states of the health which are referrible to an abnormal condition of the nervous system. This was proved by the practice in that speciality, which soon flowed to him. Letters were continually addressed to him by practitioners in every part of the country, declaring that his writings had rendered cases clear and intelligible which were previously involved in the deepest mystery. He was frequently summoned to the most remote parts of England, and even beyond its limits. On one occasion he crossed to the Isle of Man, on another to Hâvre, for a consultation. Patients from distant parts of the world came to England, specially to consult him. An American physician brought his two sons, afflicted with epilepsy, across the Atlantic, for the sole purpose of obtaining his advice, and, having availed himself of this, immediately re-crossed the ocean to Boston.

A curious incident occurred when, at a later period, we were in the United States. One day, during our stay at Baltimore, the card of "Bishop Boone" was brought to our room, and was followed by the entrance of a gentleman with a very frank, round, English-looking face, which for the moment gave us the impression that we were receiving a fellow-countryman. His manners were as prepossessing as his countenance, and his story was speedily told. A Georgian by birth, he was now bishop of the "American Mission" at Shanghai, and, being a sufferer from a disordered state of the nervous system, had been strongly advised by Mr. Rutherford Alcock, formerly a London surgeon, but then British Consul at Shanghai,* to go to England in order to consult Dr. Marshall Hall. The bishop, being cautioned to avoid the fatigue of the "overland route," had sailed from Shanghai across the Pacific and round Cape Horn to New York, intending to proceed thence to London. When on the point of securing his passage to Liverpool, he was told, to his great surprise, that he might spare himself that trouble, as Dr. Marshall Hall was then actually at Washington. The bishop telegraphed to the Smithsonian Institute in that city, where the Doctor had recently delivered a lecture; but he had left the place, and his address was not known. After some further search, Bishop Boone eventually found us at Baltimore. My somewhat long narrative has the happiest conclusion: before we quitted the United States, we had the

* The great ability of this gentleman, whose health had obliged him to quit the practice of his profession, has since led to a high appointment.

pleasure of seeing this amiable patient completely restored to excellent health by a strict attention to my husband's injunctions, and thus repaid for his voyage from the Antipodes.

The discovery of the Diastaltic Nervous System is now, I believe, universally received. Investigations are founded upon it even without reference to its discoverer, sometimes without any allusion to his name. A distinguished physiologist says, in a letter to myself:—

> I hold that the most recent researches of our anatomists and physiologists, as ——, ——, ——, &c., could be shown to have only confirmed and extended the views of Marshall Hall, and to owe all their importance to his labours.

The generation which opposed him is passing away, while those who are entering upon the stage of scientific research receive his discoveries as a matter of established fact and of history. But they cannot, in one sense, fully appreciate their importance, inasmuch as they knew not the darkness and confusion in which the subject was enveloped before Marshall Hall introduced light and order. The new era which it constituted in physiology, the revolution, indeed, owing to the flood of light which it poured upon all diseases connected with the nervous system—and these are a legion—can scarcely be imagined by those who enter upon the study of physiology and pathology subsequently to its adoption.

They who had the sagacity and the honesty to uphold the doctrine in its early days, have had no reason to regret such a course, as may be seen from the following extract from an address delivered at St. Thomas's

Hospital by Mr. F. Le Gros Clark, on the 21st of January, 1852:—

There are other phenomena exhibited by the muscular system to which reference has not yet been made; I allude to the reflex movements which have their source or centre in the spinal cord.

This subject is one of peculiar interest to me; for I recall the time when the great philosopher, with whose name this system must ever be associated as its discoverer, was *the object of obloquy*, and *denounced as the propagator of absurd and idle theories;* a time when, as a mere youth, I was first honoured by his notice, and when the experiments I witnessed in his company, and the deductions he drew from them, came home with all the force and freshness of simple truth, to which I yielded my unreserved assent.

These truths have now prevailed, and the name of Marshall Hall must live as long as physiology remains a science.

Professor J. Hughes Bennett says:—

Defence of the doctrines of Marshall Hall is every day becoming less necessary. The truths he taught us have already taken up their permanent and proper position in the field of science, and will render his name more and more illustrious, as time hands them down to succeeding generations.

Another valuable and interesting letter, from the same gentleman, concludes thus:—

It is my conviction that when the bitterness of personal opposition has subsided, the impartial world of science will award to Marshall Hall the honour of not only originating, but of establishing and practically applying to the treatment of disease, one of the most important physiological doctrines discovered since the days of Harvey.

Although from the Royal Society of London, expe-

rience teaches us not to expect justice to Marshall Hall, the Royal Society of Edinburgh, in an obituary notice, speaks of his greatest physiological discovery as "sufficient of itself to stamp Marshall as an inventive genius, whose name will go down to posterity as one of the pillars of physiological science in the present century."*

* See the obituary of the *Edinburgh New Philosophical Journal*, 1858.

CHAPTER VI.

PRACTICE.

THE history involved in the two chapters immediately preceding this, in which I have endeavoured to sketch the long and determined opposition which followed the discovery of the Diastaltic Nervous System, and its final triumph and establishment, although here compressed into so small a space, must be understood by my readers to extend over the long period of twenty-five years. I now proceed to add some details in reference to Marshall Hall's practice.

His student days having been passed in Edinburgh, and the first ten years of his professional life at Nottingham, he had acquired no personal friends in London. He came thither unpatronised, unfriended, and unknown, except from his reputation as an author. It has been truly observed that—

> His success in the metropolis was the more remarkable as it was attained notwithstanding the want of early friends or associates, of hospital connexion, of college influence—nay, in spite of considerable coldness and opposition. He owed his success entirely to the force of his own reputation, to his indomitable and untiring industry, to his rare knowledge of disease, and to his sincere, straightforward character, and

honourable conduct. . . . . His perfect knowledge of his profession, his diagnostic acumen, and his careful application of these to the case in hand, soon gained him patients and friends. Those who witnessed his conscientious methods of examining his patients, were not surprised that he acquired and retained their confidence and esteem.*

The nature of his early practice in London is thus described by himself :—

During the first years of my practice in London, my attention was chiefly called to female diseases on which I had written ; † but now it was directed to the train of physiological investigation of the nervous system, fixed upon this subject by the fact of the movement of the separated tail of the triton, on the application of a stimulus to the external integument—to which I have adverted. And, as it became publicly known that my attention was thus directed to the nervous system, I gradually lost sight of the class of female diseases, and became consulted on the subject of diseases of the nervous system.

A physician in London may have a reputation for knowing *one* thing well, *or* for knowing *all ;* but he cannot have a reputation for knowing *two.* It is singular how steady my income was during this change of practice.

To enable the reader to judge for himself in regard to Dr. Marshall Hall's pecuniary success in practice, I make the following quotations from account books. I have already said that during his first year in London he received 800*l.* in fees. This sum gradually increased till, in 1833, having been seven years in the metropolis, it amounted to 2200*l.* This was the period of his important discoveries in the nervous system, when the *change* of practice above alluded to

Lancet biography, 1850.

† "Commentaries on Diseases of Females." Longman.

began to take place. From the time when he was known to be devoting himself to physiology, his practice, instead of annually increasing, as heretofore, slightly diminished during a few years, so that his discoveries may be considered as having retarded his progress in practice. Doubtless the great injustice systematically carried on against him in certain medical periodicals, as already related, was very injurious to him. People in general dislike the trouble of thinking for themselves, and therefore too readily accept the representations—often distorted—of reviewers. But, in spite of the envy and jealousy which pursued him, and notwithstanding the vulgar prejudice that the cultivation of physiology is incompatible with the character of a *practical* physician, his practice at length gradually increased, though not in the ratio of the years preceding his physiological discoveries, nor to such an extent as, reasoning *à priori*, it would have done, had he never made those discoveries. When he had been twenty-three years in London, it amounted to 4000*l.* a year, although he annually made a tour on the Continent, of several weeks, occasionally even two months. Had he continued longer in practice, there is no doubt this sum would have been much augmented, as his fame was on the increase, when he so prudently, and as regards age, prematurely, retired from active practice. His success, such as it was, thoroughly contented him.

[believe I may define physiology, for such of my readers as are unaccustomed to medical phraseology, as the study of the vital functions of animals and vegetables. The breathing and the circulation are instances of physiological acts.

There is perhaps a peculiar satisfaction and enjoyment in that which a man earns for himself, and this was Marshall Hall's. Everything he possessed—fame, money, position—was the fruit of hard working, and he thoroughly enjoyed it as such, with an honourable and well-founded pride. He frequently said, "It is much more noble for a man to make his own fortune, than to depend upon others."

His patients were of all classes, including some of the highest of the aristocracy. I think, however, that the majority belonged to the upper grades of the middle classes.

His practice consisted much more of cases in which he attended alone, than of consultations; and a large proportion of his patients were, I think, persons who came from the country specially for his advice. A great portion of his professional gains was received at home, in his consulting-room, during the morning hours set apart for the reception of patients—sometimes, though rarely, to the amount of sixteen guineas in one morning. Thus, much time was saved which would have been consumed in driving about, and a profitable day's work nearly done before he entered his carriage at a quarter to one o'clock. He was frequently summoned to distant parts of the country, and even beyond its limits, his fee, before the modification introduced by the establishment of railways, being the usual one of a guinea a mile, and afterwards two guineas for every three miles of railway travelling, as he ascertained by applying for information to the highest medical authority. The profession

in the country consulted him much in difficult cases; they were beyond the sphere in which jealousy was at work against him, and they were profoundly impressed by his writings.

Although aware of the injury to his practice likely to result from the pursuit of physiology, such was his enthusiasm in the search after truth, that no such consideration could deter him from its prosecution. He himself wrote: "The physician who studies physiology must be prepared for pecuniary sacrifices;" and he often said that, if thereby doomed to poverty, he would nevertheless pursue science. His love of investigation was indeed so ardent, that he continued to prosecute the *science* of his profession without the slightest abatement of zeal, after he quitted *practice*, and to the very end of life—with what beneficent results I need not here repeat.

A very remarkable proof of his love of investigation, and his comparative indifference to the pecuniary gains of practice, is afforded by the following paragraph, which concludes a communication to the *Lancet* "On the Diagnosis of the Different Kinds of Muscular Paralysis," dated August, 1849:—

> My reader will not be surprised that, with all these questions in my mind, I should meditate a journey as far as the seat of the Austrian and Hungarian warfare, with the view of observing tetanus in the wounded of those battle-fields.

This project, though seriously entertained, was never carried into effect. A similar desire seized him at a later period, when a war was carried on in Schles-

wig-Holstein. It will be remembered also that, in 1837, he explained to the Council of the Royal Society, through Mr. Lawrence, that, in his view, his subject was of such importance as to induce him to propose, if encouraged by that learned body, the sacrifice of his professional gains for five years, in order to pursue his investigations without interruption; a proposition which was rewarded by the rejection of his paper, and the refusal to look at his experiments. I merely refer to this as confirmatory of the statement at the commencement of this paragraph.

It may be asked, why Marshall Hall formed an exception to the supposed general rule, that physiologists do not succeed in practice? Perhaps they are usually rather of a speculative than of a practical turn of mind. It was, however, a peculiarity in him that he not only traced a principle backward to its origin, but also forward to its results. Not one of his physiological discoveries remained with him a mere barren fact. This will again be observable when we notice that happy application of principles which led him to devise the simple and efficient mode of resuscitation to which his name has since been attached.

Sir Benjamin Brodie, in a letter to my husband, says:—

> I agree with you in the opinion that it is from the labours of men of science that the greatest improvements in the healing art are to be derived. But I am sure that you will agree with me, when I say that there is no reason why the character of the man of science and that of the practical man should not be realized in the same individual.

Marshall Hall may be regarded as an example of the truth of Sir B. Brodie's enunciation.

We must now consider specially the influence of his discoveries in the nervous system upon his practice.

The Excito-motor, or, as he afterwards preferred to denominate it, the Diastaltic Nervous System, embraces an almost unlimited field both in health and disease. In describing what his discoveries unfold, it has been stated that—

The nature of the acts by which we breathe and take our necessary food, the nature of all the acts of ingestion and egestion, the nature of a thousand morbid actions constituting the class of spasmodic and paroxysmal diseases, was previously altogether unknown.

How rich a practical fund of therapeutical measures naturally follows the physiology and pathology of the excito-motor system, every well-informed physician can testify. Two departments of medical practice have gained incalculably. The success of Dr. M. Hall in the treatment of nervous diseases was almost entirely the result of a rigid application of his own physiological discoveries to their pathology and therapeutics. Obstetricians have found their art elevated more than any other branch of medicine. In the place of uncertain and empirical rules, there are now definite and scientific principles upon which to fall back, with the unhesitating assurance that they will stand in good stead. Innumerable symptoms of other diseases are rendered intelligible and rational, which before were obscure and empirically treated. But to follow out the influence of Dr. Marshall Hall's discoveries through their numerous and important ramifications, would be almost to write a volume on the principles of medicine. It is impossible to say when we shall cease to find some new and important application of his discoveries to the great art of healing.

Lancet memoir of 1857.

The following just observations have been made by Dr. Reynolds :—

To Dr. Marshall Hall is due the merit of having rescued the obscure class of convulsive affections from a region of *utter unintelligibility*, and of having referred them to the derangements of an organ, the functions of which his own researches had enabled him to explain. But Dr. Hall did not rest satisfied with a mere general reference of these affections to disorders of the spinal cord. He devoted all his energies to the discovery of the *modus operandi* of the morbid centre, or convulsive tendency, in producing an attack. Various papers appeared in the *Lancet*, on "The Neck as a Medical Region," and the more important portions of these were comprised in his "New Memoir on the Nervous System,"* and in his "Aperçu du Système Spinal,"† written and published only two years before his death ; and in these productions Dr. Hall described with remarkable ingenuity the mechanism of the convulsive paroxysm, and of many other affections assuming a paroxysmal type. In these papers he has directed attention to the existence of four classes of epileptic paroxysm,—the laryngismal, trachelismal, syncopal, and abortive ; and has not only described, more or less fully, the mechanism of each, but has laid down rules for their diagnosis and treatment.

During the whole of his career, the science and art of therapeutics were constantly held in view by Dr. Marshall Hall. The action of strychnia as a spinal excitant, or, in small doses as a spinal tonic ; the direction—general, regiminal, and medical—of the epileptic patient, in order to avoid all the excitants of convulsive action ; the recommendation of tracheotomy in *laryngismal* epilepsy ; and the simple but beautiful "Ready Method in Asphyxia," were among the later efforts of Dr. Hall's great genius. The treatment of epilepsy has been rescued by him from mere empiricism ; and many are now living, and in the enjoyment of health, who can bear the

Baillière, 1843. Masson, Paris, 1855.

most convincing evidence to the success which attended his practice.

As a practical physician, Dr. Marshall Hall will long be remembered with gratitude, both by those who have had the advantage of witnessing his mode of examining a case, and by a far larger number who had the advantage of being placed under his care. The two prominent features of his treatment were simplicity and perseverance. We have seen numerous cases in which his administration of simple aperients, together with strictly regiminal measures, had wrought extraordinary cures; and we know of previously paraplegic men, now well, who, under his direction, took strychnia for much longer than a year; and of so-called epileptics who slowly recovered from the most frightful combination of symptoms, while kept by Dr. Hall for sixteen or eighteen months under the influence of mercury.

The following unpublished manuscript by my husband, and a letter on the same subject, dated November, 1854, will not be without interest to the medical reader:—

On the Acetate of Strychnia.

Strychnia, in the vegetable kingdom, answers to the Diastaltic Nervous System in the animal kingdom. Its action is specifically on the *centre* of that system—the true spinal marrow. Its mildest action is that of an invaluable spinal tonic. Its mean action is that of a special spinal stimulus, terrific in its effects. Its most violent action is that of the thunderbolt.

My dear Sir,—Epilepsy frequently induces in the patient a state of pallor, weakness, and thinness—a *shattery* state, I call it, for want of a better term—which is accompanied by great *excitability*. For this I think strychnia the remedy; and the formula I have adopted for its safe administration is the following:—

[The formula is here given.]

I thus give from $\frac{1}{100}$th to $\frac{1}{60}$th part of a grain thrice a day in a little water, in the midst of meals. Its effects in such *shattery* state, whether from epilepsy or other causes not organic, are charming.

The mercury I give for organic change induced in epilepsy marked by imbecility of mind or limb, &c. I continue its use for from three weeks to three months, giving it internally; but avoiding all extremes.— &c., MARSHALL HALL.

I have made the foregoing numerous quotations in order to give some idea of the practical results which my husband educed from his investigations. After their perusal, the reader will not be surprised that the profession in general had sufficient discrimination to appreciate the opinion of Marshall Hall, and that his advice was eagerly sought as the ablest in this kingdom, in cases of the above nature. His practice thus became almost entirely one in Nervous Disorders, comprising a large class of the ills to which humanity is heir. From the first promulgation of his researches on this subject, he was occupied in their practical application and development, and it has been remarked that "the admirable success with which he indoctrinated the profession at large with his views must be attributed as well to his native lucidity as to their inherent truth."

Dr. A. T. Edwards, of Wiveliscombe, in a letter of consultation respecting the case of a distinguished patient, in 1838, says to my husband:—

I am greatly indebted to you for the delight and instruction I derive from the perusal of your Lectures in the *Lancet*. For my own part, I do not hesitate to say I have a higher

opinion of your knowledge of the nervous system than of all the authors combined who have treated the subject.

I have reason to believe that the opinion thus expressed by Dr. Edwards was that of the profession generally.

Meanwhile his pen was constantly employed, and works were published by him at short intervals, an enumeration of which will be found at the end of this volume. His writings, at this period, were chiefly on the nervous system. Two small volumes, however, appeared, under the title of "Practical Observations and Suggestions in Medicine," comprising a vast variety of practical subjects, compressed into short papers.* These have been read with extreme interest, not only by the profession, but also by many non-medical persons of intelligence.

Towards his professional brethren Marshall Hall was scrupulously honourable. His punctuality in observing appointments was extreme. In his anxiety not to keep his medical friends waiting, he sometimes happened to arrive at the patient's house a little before the physician, or general practitioner in attendance, and in that case he usually remained in his carriage

I recently wrote to Mr. M. H. Higginbottom, requesting him to furnish me with a short account of these two volumes. His reply, however, is:—"I find it impracticable to make an abstract; *all* the papers are valuable and suggestive, but *so concisely written*, that I think it would be impossible still further to condense them." Two chapters deserve special mention—one "On the Use of the Alcoholic Lotion in Phthisis Pulmonalis," as having been the means of saving many valuable lives; and that "On the Temper Disease," which is a curious study in human nature, as well as in medicine. The work was published by Mr. Churchill.

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till the arrival of the latter, thus avoiding all discussion in his absence. Nothing could induce him to deviate from the severest integrity towards other practitioners. This was sometimes complained of by patients: a lady, in regretting that, owing to the strictness of his views on these points, she could not prevail upon him to prescribe for her, says, in a letter, "I think your rule of professional etiquette unusually and inconveniently strict." Among his manuscripts I find the following:—

ON ETIQUETTE.

[After a few preliminary remarks, he observes—]

For every and each visit to or from a physician or surgeon, the honorarium or fee is one guinea; to take less, except as a matter of charity, properly explained, is to interfere with the province of the general practitioner.

In every consultation with a general practitioner or the family physician, the consultant should enter the patient's house last, and leave it first. In this manner he will avoid insidious questions.

I now proceed to lay before my readers the valuable recollections of some who had many opportunities of witnessing my husband's modes of proceeding in the sick room. The following is kindly furnished me by Henry Gregory, Esq., of Herne Hill. I cannot withhold the very just remarks relating to the general character, which precede those of a more medical nature.

I cannot fully express the enjoyment I always felt in the society of the late Dr. Marshall Hall. I was introduced to him in 1826, upon his leaving Nottingham and settling in London. He had many qualities not often found united; his

straightforward, manly conduct, his clear mode of expression, and his scientific knowledge far surpassing anything I had generally observed amongst men.

In debate or conversational argument nothing seemed to escape his penetration. His minuteness in bringing out little things which others thought not of, was remarkable; with one little atom, so to speak, a light would shine forth from him so brilliantly that I could only sit and admire his remarkable mental gifts. He was a great man and a genius, and, like all the truly great, made no parade. By his kind, easy manner and nice mode of expression he soon gained the attention of those who conversed with him. As a young man he made a deep impression upon me, and many of his remarks live in my memory to this hour, and are practically useful in my present every-day life. He was the educator of the intellect; his domain was pure scientific research. The earnest activity of his mind made him proceed, and every advance he made was a clearing away of error and an establishment of truth. He never spared himself or his own, but thrust himself forth to labour, with watchfulness and benevolence, from which he never deviated. He may have wandered from his fellows in his profession, but it was in advance of them; with them, or alone among them, he was ever brooding over the mysteries and searching into the deep things of the medical domain.

In emergencies he was both prompt and cautious; when anxious excitement surrounded him, it did not disturb his judgment. In dangerous and difficult cases he was always calm. His deep sense of duty and responsibility was unbending. After nearly thirty years of personal knowledge, and witnessing frequent cases in which those qualities which I have described were pre-eminently exhibited, I feel I have a right and authority thus to express myself, and to say his death was to me a personal loss. The opinion formed at the early period of my life was confirmed and strengthened, firmly and fully maintained until the close of his life, and deeply have I felt, and still do frequently feel, the want of such a friend, in all cases requiring medical advice.

I hope it will not be uninteresting if I mention a few cases of severe illness, connected with my own family, that came much under my own knowledge and inspection, and wherein the qualities I have described were so pre-eminently maintained by him.

In a case of fever, he differed much from the regular medical attendant of the family, as to bleeding the patient, and would by no means consent to it. He was unexpectedly obliged to be absent three days, and before leaving he obtained a promise that no bleeding should take place before his return. During his absence, which was longer than he had anticipated, further advice was sought, and the promise was broken. About an hour before he reached the house, the bleeding had taken place: the instant he heard this, and before he had seen the patient, he exclaimed—"She will never rally!" and in a few hours she was no more. Although only called in as a physician, he came twice and three times a-day, watching the case with intense interest, and investigating every symptom with great minuteness. During the hours between his visits, I wrote down any remark made by the patient about her feelings, any change that occurred, or any new symptom that showed itself, as he desired every means of correcting and forming his judgment.

Soon after the event to which I have alluded, I retired to the country, and was seized with a similar fever. Dr. Hall came from London to see me; the medical gentleman in attendance was so much pleased with the ability and judgment displayed, and the great pains taken in giving his instructions, that a professional friendship was formed, and ever after, in all cases requiring further assistance, Dr. Hall was consulted, Mr. ——— ever retaining for him the greatest respect, and bearing the highest testimony to his ability and judgment.

In the case of the rupture of a blood-vessel on the lungs, with very severe hæmorrhage, the patient was reduced to the helplessness of an infant. Folds of linen, kept constantly wet with an alcoholic lotion, were, by Dr. Hall's order,

applied night and day to the chest.* As soon as possible he was taken to the open door, to inhale the fresh air without fatigue; proceeding, when sufficiently strong, to the sea; and the nourishment was gradually increased. The patient so far recovered that, in about five years, he returned to his usual mode of life, and now, at seventy-two years of age, is in a fair state of health.

In a case of confinement, distressing symptoms appeared; the surgeon was confused and perplexed. I went directly for Dr. Hall. "I will go with you," he said, "but the case belongs to Dr. R. Lee's department; we had better call him up and bring him with us." Dr. Lee, on seeing the patient, observed—"I hope I am in time; there is not a moment to be lost; an operation must be performed instantly." It was accomplished most satisfactorily, and her life was preserved. Here again Dr. Hall showed himself prompt and decided, leaving nothing to chance. Dr. Lee observed, "You, my dear sir, have to thank Dr. Hall, under God, for the life of the patient, in bringing me at the time he did." I have frequently heard Dr. Lee express his high admiration of the abilities of Dr. Hall.

In a case of a deep-seated disease, where much suffering was endured, Dr. Hall was most attentive. However restless the patient might be, his visits revived and cheered her, so that he was looked for by all of us, as well as by the sick one, with an earnest desire, knowing how refreshing his visits were to the dear sufferer. Dr. Hall's minuteness in giving instructions struck me very forcibly. He wrote them down in order, numbering them, and then read them to the mother of the patient, who directed the sick-room, explaining the time and manner of doing everything. Having fully satisfied himself, by a kind of cross examination, that he was perfectly understood, he had the nurse in, and explained all to her in the same careful manner, thus satisfying

* This mode of treatment is fully described in the "Observations and Suggestions in Medicine" alluded to.

himself that she understood fully what she had to do. He thus secured the carrying out of his instructions with correctness and certainty, and so gave the patient the full benefit of them.

He went forth to his labour with a benevolent heart; he allowed me to send any person to him who could not afford the expense of a physician; and this I did in numerous cases, the same kind and devoted attention being paid to them as to others.

One case, of which I have a perfect recollection, is that of a woman who had seen better days, but from untoward circumstances became much reduced. To her he gave the kindest attention for upwards of two years, without any fee. At one of her visits she described symptoms which had occurred a few nights previously. "If ever these recur," he said, "send for me immediately, and I will come to you at any hour of the day or night. If you have not the means of sending a messenger, you can always send a cab. I am anxious to witness those symptoms." They did occur again; but valuable time was lost in sending for him, and when he arrived it was too late to render any assistance.

I feel I have now written enough, although I could mention other cases of equal kindness and attention. I will conclude by observing—Truth was his great research. He threw into the circumstances of his every-day life all the energies of his powerful mind to attain the highest points of his profession. He was enabled to run his destined race with steadiness and endurance unto the end. His memory is cherished in the hearts of those who knew him best, and will ever live in the remembrance of his countrymen, so long as there are any amongst us who desire the search after truth.

I now quote some particulars written by Mr. Marshall Hall Higginbottom :—

One element in Dr. Hall's extraordinary success in practice was his kind and pleasing manner in a room of sickness. He had the happy faculty of at once making his patient at ease with him, and of gaining unlimited confidence. There was a

peculiar charm in his manner, which it is difficult to describe in detail, but which was felt equally by his adult and his more juvenile patients; the former had the conviction that everything that judgment, medical skill, and anxiety for their welfare could accomplish would be done for them; the latter regarded him as a kind and interesting friend, whose visits they looked forward to with pleasure; they parted good friends upon his first interview, and his subsequent calls were always greeted with a smile. His questions to the patient were few and simple, but always to the point; a glance was frequently sufficient for him to form an opinion of the nature of the complaint. The facility he possessed of forming a correct diagnosis, and consequently prognosis, would have appeared intuitive to those who had not known how many years he had spent in close study and careful observation, in order to acquire that facility.

After examining the case, and having ascertained who was the responsible nurse, he would impress upon that individual the necessity of seeing that all his orders were fully and punctually carried out. His directions were plain, and more than once repeated; he would say—"Now, recollect, you have so many things to attend to"—enumerating them one by one, on his fingers, and getting the nurse to go over them in the same manner and order. Upon his next visit he would inquire if all his directions had been attended to, again making the nurse repeat them. If anything, however trivial, had been omitted, a very unusual occurrence, where the duties had been so fully impressed on the memory, he would express himself as being much dissatisfied, and insisted upon the necessity of being implicitly obeyed for the future. In severe cases he would order the hours at which medicines were given, and other means used, to be committed to paper, and shown to him at every call.

My next extract is from the letter of an acute observer—Sir E. L. Bulwer Lytton.*

* This distinguished author has made kindly allusion to the subject of this memoir in his charming tale of "The Caxtons."

I felt sympathy with Dr. Marshall Hall from the first, in the conviction of his earnestness and sincerity. That urbanity, which is one of the essential qualities of a physician, seemed in him to be no surface of manner, but to come direct from a warm and humane heart, interesting itself immediately in pain and suffering, and unaffectedly anxious to give relief. I should have imagined from what I saw of him that his natural temperament was bold and prompt, and that it had gathered the prudence necessary in pathology and in life from experience —that he was eminently frank and honourable. He had evidently made the study of human nature a part of his science, and some of his observations thereon, in illustration of his professional views, struck me forcibly, from their depth and justice.

It is scarcely necessary to add one word to these ample and enlightened testimonies. A few additional particulars may however not be uninteresting.

My husband usually made the patient himself describe his symptoms and feelings. A highly intelligent lady, engaged in education, who occasionally sought his advice for her pupils, tells me that whenever she began to relate the case or describe the symptoms of a young lady, he usually interrupted her, saying—"Let the patient tell her own story."

It has been said that "good questioners make good answerers." His questions were very searching and pointed, and he liked a concise, straightforward answer. The acumen with which he elicited facts in his examination of a case, was something very curious and remarkable, leading frequently to the most important detections in disease. Thus he often brought to light those "hidden seizures," which he was the first to notice prominently in his writings. The

existence of these, totally unsuspected by the patient or his friends, frequently explained symptoms and events previously inexplicable.

His general hygienic directions involved a careful diet; much exercise in the open air, short of fatigue; efficient clothing, especially for the very young. The present fashion of half dressing children, prevalent in England, he considered barbarous and calculated to sow the seeds of much disease. He directed that in children the whole surface of the body and limbs should be covered with flannel, the upper clothing varying in texture according to the season and the temperature.

Brisk walking was a point he strongly insisted upon. One patient, the widow of a colonel in the Indian army, was, like most of those who have long resided in that climate, indolent and averse to exercise. Her ailments arose from this cause, and she told me that Dr. Marshall Hall's prescription for her was—that she should daily walk from her residence near Hyde Park to the Serpentine, and dip her finger into it!

Amongst remedial measures he included—*occupation;* and with a view to this, he exercised a peculiar tact in drawing out the patient's mind, in order to engage it in some congenial pursuit, by way of distraction.

In a letter to a lady, after laying down various rules for the management of her health, he adds:—

I advise you to take up some systematic *mental* occupation during the rest of the day. Nothing is so injurious as

unoccupied time. The mind then dwells on every ailment, the tongue becomes white, and the stomach deranged from mere emotion. Ether is very bad. The best *cordial* is cheerfulness.

On another occasion he wrote, "Happiness is the best tonic." Among those scraps of manuscript in which are recorded many of the thoughts passing through his ever-busy mind, is the following:—"Man lives *a life of emotion*, and emotion has to do with the physician's office far more than has hitherto been imagined."

He could not endure loose modes of reasoning, or the adoption of remedies without a "wherefore." He considered that the grand thing in medicine is to form a correct diagnosis. Who would be so senseless as to attempt to repair a machine without first ascertaining the exact locality and nature of its disturbed action?

Having, by a deliberate and careful examination of a case, ascertained the precise nature of the malady and its exciting causes, a great part of his treatment consisted in the avoidance of those causes and a strict attention to the general health. Thus he himself wrote:—

> There is no royal road to the cure of epilepsy. The idea of a remedy for the disease is unphilosophical; and the treatment should consist in a well-devised plan, embracing every means of good, and avoiding every means of harm.

Such however is, with some, the morbid appetite for specifics and novelties, and such the superstitious

belief in the marvellous, that so simple yet reasonable a mode of procedure scarcely satisfies.

Courage, decision, and promptitude—qualities so essential in a physician—were conspicuous in Marshall Hall, and with these he combined extreme caution. He possessed also great presence of mind under any circumstances of immediate danger, and his power of judgment did not forsake him even on occasions where his affections were strongly implicated.

Although, among a vast variety of patients, some, of course, are unjust, unreasonable, and impossible to please, yet in general he retained their confidence in a remarkable manner. When about to retire from practice, he said,—

> In reviewing my professional career, I am struck in observing how my old Nottinghamshire patients have remained constant to me, after the lapse of upwards of thirty years. If I lose sight of them for a time, they are sure to reappear.

The unbounded confidence which his patients reposed in him, and the extraordinary influence which he usually gained over them, were, of course, principally caused by a firm conviction of his superior professional knowledge, ability, and judgment; but his moral qualities—his unswerving straightforwardness and high principles—doubtless had their share in producing it. The amenity of his manner and his earnest unaffected sympathy with the patient must also have contributed to his success. A Scotch minister, who had sought his advice, said:—"Do you know, Dr. Hall, what I believe to have been one great

cause of your success in practice? It is, that you place your soul in the stead of your patient's soul!" —alluding to a passage in the book of Job. The fact is, he really felt with and for all who were suffering, and when this is the case, it is easily discoverable.

His manner was cheerful—often playful and jocose; and he generally succeeded, when a hypochondriac visited him, in dispelling unnecessary fears, and replacing these by a re-assured and happier tone of mind. But though kind and patient with the timid and nervous, there never was the slightest approach to "cant;" in fact, he abhorred what he called "the coaxing and wheedling system." His independence of spirit and self-respect were far too great to allow him to descend to this. Never would he, for one moment, brook the slightest indignity: he had indeed an unusual share of that quality generally called *spirit*, as was observable on all occasions, from the early age when he so soundly thrashed the young tyrant at school. His interviews with his patients were characterized by refined and gentlemanly feeling in every respect. This observation has been constantly made by those who had ample opportunity of judging. Indeed it could not be otherwise, for such was his very nature.

Perhaps no physician ever gave so much gratuitous advice, apart from hospital practice, as did Marshall Hall. This was by no means limited to the actually poor, but included a vast number of persons in the middle ranks of life, who could not well afford the

physician's fee. He preferred rather to refuse this altogether than to take less than his proper fee; for he was scrupulously careful not to lower the dignity of the profession. Where he felt a debt of gratitude to the patient, he would not hear of remuneration and, in many instances, ties of friendship caused him to refuse the honorarium. In all such cases he never spared his trouble. He had no avidity for money, and his success in practice gratified him far more as an evidence that he was appreciated, than on account of the pecuniary gain.

On the indigent, suffering needle-woman he bestowed as much of his earnest attention as on the lady of rank, and such persons were encouraged to repeat their visits; in fact, the poor never were made to feel the difference between themselves and the rich.

The following observations have been made by Dr. J. R. Reynolds:—

To the poor Dr. Hall was universally attentive and kind. He constantly had under his care large numbers of gratuitous patients; but, besides the quite humble classes, there were numbers placed pecuniarily in the lower ranks of the middle classes, to whom gratuitous advice is a far greater charity, and these he was ever ready to welcome, and from them he would receive no other reward than gratitude. "Our mission is to cure the curable, and comfort the incurable," we have more than once heard him say; and in fulfilling that mission he had his reward. He has gone, and whither he has gone we cannot follow him; but his works live after him, and we know that thankfulness to him fills many hearts when they join the unbroken circles of their homes, and that tears fill many eyes when they read that Marshall Hall has passed "into the silent land."

Just after the bereavement here alluded to, Dr. Reynolds, in a letter to myself, relates a simple but touching incident :—

The old postman, Hawkes, and his wife, were here a few days ago, and both of them wept most bitterly over the great loss which so many, besides themselves, have suffered. They desired me respectfully, but warmly, to express their sympathy with you and your son.

I must not omit to mention a professional engagement which was a source of great interest to the subject of this biography. His investigations in the nervous system naturally involved some attention to mental disorders, and in 1839 he was requested by Mr. Stilwell, the proprietor of the asylum at Moorcroft House, Hillingdon, near Uxbridge, to become the consulting physician to that establishment. The terms on which alone he undertook this office were—a stated fee for each visit—this being the mode of remuneration which he preferred to any other. Once a fortnight, and more frequently, if requisite, he paid a visit there, and I doubt whether anything in his whole practice gave him equal pleasure. Sometimes it was with difficulty that he could get through his list of patients in town in time to allow him to take the train at about four o'clock, the hour appointed for this engagement. Wearied with the turmoil of London practice, it was refreshing to him to repair to the charming country place, where the genuine welcome of the most amiable of families always greeted him. For each of the patients he had a kind

word, which penetrated as a ray of sunshine to the often benighted hearts of those afflicted ones. In some instances, the lively gratitude thus awakened grew into a friendship which endured after the cloud had been dispelled and the suffering one dismissed in happiness from this asylum. The family who conducted this institution won the affection, whilst their plans and proceedings elicited the unqualified admiration of my husband; and I have often heard him declare, after an intimate acquaintance of fourteen years, that he had never seen anything in them which did not command his esteem. This, from him, was great praise; for his standard of excellence was high, and he was too truthful to gloss over that which was wrong. I have the pleasure of knowing that his sentiments towards the Stilwell family were warmly reciprocated. On one occasion the late lamented Dr. Arthur Stilwell wrote to my husband—"It is peculiarly gratifying to me to have your esteem, as there is *no one's* I *so highly* value." In a kind letter from his widow, so pleasant a picture is presented, that I beg to quote her words:—

I believe Dr. Hall's visits gave more pleasure to all at Moorcroft than anything else in the whole year. The patients looked forward to his cheerful conversation at the tea-table, and I am sure my beloved husband highly appreciated his society. Many times have I heard him say he always learnt something from Dr. Hall worth knowing, besides the enjoyment he felt in his society generally.

As a proof of the kindly feeling of the patients towards my husband, I cannot refrain from inserting

the following verses composed by one of them on the occasion of his birthday. Any want of literary merit is amply compensated by the amiability of the sentiments :—

Oh lend your help, my friends, I pray,
To welcome in this happy day!
We hail it as the birth of one
Whose kindness every heart has won.

A day of joy, a day of glee,
This day to us will ever be.
May blessings every hour be shed
Upon his path and on his head;
True joy and peace his portion be,
And days unnumbered may he see!

On another occasion one of the patients wrote thus to him :—

I feel myself, on every fitting opportunity, called upon to express my very grateful thanks for the kind interest you have taken in my truly unfortunate case. I do most sincerely assure you, my admiration of your talents as a physician is only surpassed by the homage which is due to your benevolence, truth, and honour as a man; and I am certain the majority of the medical profession are but too proud to put forward Dr. Marshall Hall as an excellent example that original and first-rate genius is only found in connexion with a generous and sympathizing heart.

CHAPTER VII.

LECTURES.

ALTHOUGH he never had the advantage of holding the office of physician in any London hospital, Dr. Marshall Hall lectured at several medical schools at various times. In 1834 he was invited to join that in Aldersgate Street, as lecturer on the Practice of Medicine, an office which he held for two years. He then accepted a similar appointment in the Webb Street School, celebrated as that of the Graingers. About the same time he was induced to undertake the lectures on the practice of medicine at a medical school then recently established near University College, and which received the name of Sydenham College. Here his success was splendid; he immediately had a very numerous and most attentive class, which continued to increase until he gave up his post on account of health. During two winter sessions he lectured at *both* the last two mentioned schools, driving in the evening from the one to the other. This proved too great a fatigue. Webb Street was very distant, and he found it a great exertion to his voice, which was not powerful, to speak in its theatre. In fact, his throat and voice became, for the first time in his life, so much affected, appa-

rently from this exertion, that he was obliged to procure a deputy to finish the course in 1839, Dr. Risdon Bennett kindly undertaking this task.* His throat becoming somewhat better from rest, he offered himself as a candidate for the professorship of medicine, then just vacated by Dr. Elliotson, at University College. On this occasion he consulted two friends, who advised him to withdraw at once, on finding that the period for the election had been deferred, apparently for the purpose of electing a particular candidate. His reason for desiring this appointment was, chiefly, its being the only opportunity likely to be afforded him of giving *clinical* instruction; inasmuch as the other London hospitals usually appoint their physicians from among those educated in their respective medical schools, and thus his Edinburgh education appeared to exclude him from so advantageous a position. On the expected retirement of Dr. Williams from University College, a strong wish was expressed by many of the students of that institution that Dr. Marshall Hall should again become a candidate; this, however, he declined. On the former occasion he obtained testimonials only from a few of the highest members of the profession in England and on the Continent, from some of which I make the following quotations. The first is from a physician, whom my husband designated as the Bacon of medicine:—

The late Mr. Guthrie, about this period, examined his throat, giving the opinion that the affection was that commonly called the clergyman's throat, arising from over-exertion of the voice, and strongly advised him to give up lecturing.

Paris, le 17 mars, 1839.

Les écrits de M. Marshall Hall sont depuis long temps en possession de l'estime des médecins de tous les pays. L'auteur des *Mémoires sur la Moëlle Épinière proprement dite*, et sur un *Système de Nerfs Excito-moteurs*, a bien voulu me permettre de lui témoigner publiquement toute mon estime, en acceptant la dédication de mes recherches sur *la Saignée*. Il m'est doux de lui renouveller aujourd'hui ce témoignage d'estime, auquel j'ajoute que plus d'une fois, dans les voyages de M. Marshall Hall à Paris, j'ai profité de ses avis, et j'ai pu me convaincre que le grand Physiologiste n'était pas moins habile Clinicien. La science et l'esprit d'exactitude gagneront là où M. Hall sera appellé à communiquer avec ses semblables, au moyen de l'enseignement : et ceux qui connaissent toutes les difficultés de la médecine pratique doivent faire des vœux pour que M. Marshall Hall soit appellé à l'enseigner.

LOUIS,
Méd. de l'Hôtel-Dieu, &c.

Le Secrétaire perpétuel de l'Académie à Monsieur Marshall Hall, membre des Sociétés Royales de Londres et d'Edimbourg.

Institut de France, Académie Royale des Sciences
Paris, le 14 avril, 1839.

Monsieur et célèbre Confrère—J'apprends que vous êtes candidat pour une chaire de pathologie interne et de thérapeutique, à l'*University College* de Londres. Je m'empresse de vous faire part des vœux que je forme pour votre succès.

Depuis votre premier essai sur la circulation du sang dans les vaisseaux capillaires jusqu'à vos dernières et profondes recherches sur *un Système particulier de Nerfs Excitateurs*, mon attention s'est fortement fixée sur vos travaux. Ce beau Système de Nerfs Excitateurs, incidens et réfléchis, que vous avez si bien démêlés, est un grand fait, et comme fait spécial et déterminé, et comme vue d'un vaste et nouvel ensemble de phénomènes physiologiques et pathologiques.

A une époque de la science, où le progrès ne peut plus dépendre que de l'isolement des phénomènes laissés jusqu'ici dans leur confuse complication, vous avez été un des premiers

à vous attacher aux méthodes précises et analytiques. Et ces méthodes si précieuses vous les avez portées jusque dans les deux sciences que, pour l'intérêt de l'humanité, il importe le plus de débrouiller, je veux dire la pathologie et la thérapeutique.

Je vous renouvelle donc, Monsieur et célèbre Confrère, l'expression sincère de mes vœux : ils ne sont pas seulement pour vous, mais aussi pour la Science, et pour l'Institution qui va s'enrichir de votre concours.—Votre dévoué Confrère,

FLOURENS,

Membre de l'Institut de France, Secrétaire perpétuel de l'Académie Royale des Sciences, professeur de physiologie comparée au Muséum d'Histoire Naturelle de Paris, membre étranger des Sociétés Royales de Londres et d'Edimbourg.

From Professor Müller.

Berlin, den 25 Februar, 183[illegible]

Mit Vergnügen ergreife ich die Gelegenheit, das Zeugniss abzulegen, dass die Arbeiten des Herrn Dr. Marshall Hall eine sehr ehrenvolle Stelle unter den ausgezeichnetsten Leistungen der neuern Zeit auf dem Felde der Physiologie einnehmen. Schon in seinem Werke über die Circulation des Blutes zeigte sich der Verfasser als gründlicher und originaler Beobachter und bereicherte die Wissenschaft mit erheblichen neuen Thatsachen. Noch mehr ist dieses in seinen Schriften über das Nervensystem und insbesondere über die *Reflectirende Function des Nervensystem* der Fall, welche über eine Menge von physiologischen Erscheinungen und nicht minder über viele krankhafte Phaenomene, durch glückliche Erkenntniss ihres gemeinsamen Princips und Feststellung desselben auf dem Wege scharfer Beobachtung, ein neues Licht verbreitet haben und bereits auch für den practischen Theil der Medicin von entschiedenem Erfolg gewesen sind.

(Signed and sealed) Dr. JOH. MULLER,

Prof. der Anatomie und Physiologie an der Universität zu Berlin, und Director des K. Anatom. Museums.

Translation of Professor Müller's Certificate.

I seize with pleasure the opportunity of bearing testimony that the

In 1842 Marshall Hall acceded to the request that he should lecture on the Practice of Medicine at St. Thomas's Hospital. Mr. F. Le Gros Clark has kindly furnished me with the following particulars:—

I find Dr. Marshall Hall's name in the prospectus as joint lecturer at our hospital school during the sessions 1842—43, 1843—44, 1844—45, 1845—46. In the former two sessions he lectured specially on the nervous system; in the latter two his name stood first as co-lecturer with Dr. Barker.

He strongly impressed upon his class the great importance of diagnosis; it is, he said, "*all in all*, nothing else can serve you in actual practice; know the disease, the state of the patient, and all the rest is natural and easy."

The various subjects of his lectures were illustrated in every possible manner, "by drawings, plates, preparations, experiments, and in some chronic cases by the actual presence of patients." In short, no expense and no trouble were spared; for whatever Marshall Hall undertook he did with all his heart. His pupils doubtless remember the diagram portraits of some of his poor paralytic patients. These striking though not very handsome faces formed rather an extraordi-

labours of Dr. Marshall Hall occupy a very honourable place amongst the most distinguished works of recent times, in the field of physiology. In his Essay on the Circulation of the Blood, the author had already proved himself a profound and original observer, and enriched science with important new facts. But this is still more the case in his writings upon the Nervous System, and especially upon the *Reflex Function of the Nervous System*, which have thrown a new light upon a multitude of physiological facts, as well as many pathological phenomena, through a happy detection of their common principle, with its confirmation in the way of acute observation; and which have already had the most decisive results in the department of practical medicine.

nary portrait gallery, serving to illustrate various morbid conditions of nerves, affecting the muscles of the face.

He lectured entirely extemporaneously, having carefully prepared his subject, in doing which he made very brief notes for the assistance of his memory, though I believe he scarcely referred to them during his lecture. The facts which he had to state were so clear in his own mind, that he found no difficulty in presenting them to his class in a simple manner, for he did not aim at anything showy. He was extremely punctual in commencing his lecture at the appointed hour, and conscientiously delivered the exact number requisite to constitute the course. He usually took a cup of coffee just before lecture, and if the theatre was distant, the coffee apparatus was packed in a basket and taken in the carriage, in order that his favourite refreshing beverage might immediately precede the lecture.

Such was his zeal in affording every possible advantage to his class, that, when lecturing at a school unattached to a hospital, he invited a limited number of his pupils, in turns, to breakfast at our house on certain days of the week, that they might see some of his poor patients and go over their cases with him thoroughly, saying that, "as one book well read is worth infinitely more than whole libraries run over superficially, so one patient well examined instructs more than *walking* whole hospitals."

I am enabled to quote some letters from former pupils of my husband's, which prove their appreciation

of him as a lecturer and as a friend. The first bears rather a remote date, and is from a gentleman whose name is now well known as ably filling an important public office, that of Inspector of Health for the City of London :—

September 28th, 1842.

Dear Sir—I take the liberty of forwarding you a copy of a paper on the Gymnotus, &c., on account of the interest you take in the physiology of the nervous system ; and, moreover, being assured that you will not accept it the less graciously from one who was formerly your pupil at the Aldersgate Street Medical School, and who remembers with pleasure the advantages that were due to your instruction, from that enthusiasm and zeal which you ever manifested in the promotion of our medical knowledge. I shall always with pride acknowledge it the happiest moment of my life when I became your pupil.

I am glad to see your name again as a public teacher, among those, too, who, great as they are, will, I am sure, be honoured by your association.—I shall ever remain yours most sincerely, H. LETHEBY.

In a recent letter to myself, Dr. Letheby says :—

Your late husband, Dr. Marshall Hall, was one of the most earnest of all the teachers with whom I have been acquainted ; and, knowing now from experience what are the demands on a lecturer's time, and how great is the labour of preparing for every lecture, I am astonished at the large attention which he was accustomed to bestow on his subjects : but the truth was, his whole soul was in the matter, and nothing gave him greater pleasure than the recognition of his zeal by the diligence of his pupils. His manner, too, was always so cordial and friendly that, independent of the interest which arose out of the fulness and clearness of his teaching, there was an affectionate feeling which always bound his class to him.

Add to all this, the consciousness of every pupil, that their teacher was no ordinary man, that his intellect was of a creative quality, and that although, like many other great discoverers,

his genius was in advance of the time, yet he stood foremost in the ranks of physiological science. All this, I say, commanded a reverence which has, I am quite sure, endured until now in the minds of every one of his pupils.

The *réunions* at his house in Manchester Square are among the pleasantest recollections of my life, and I know, from what remains of them, that they were also among the most profitable.

The following communication I have received from Mr. Robert Jones, of Carnarvon:—

All my recollections of Dr. Hall are pleasing: he was most kind and attentive to his pupils, and always manifested the greatest interest in them. As an instance of his kindness I may mention the fact of his coming regularly to my lodgings, after lecture, for three or four weeks while I was confined to my room by illness, when he would give me a *resumé* of his lecture, and tell me what had passed at and after it. Such attention on the part of a master towards his pupil is as rare as it was kind.

His lectures were always practical, delivered with great earnestness, and appeared to have been carefully prepared; frequently in the course of one, he would relate a case bearing upon the subject, detailing the prognosis, the treatment, and the issue of it; and the remarks he used to make in that way greatly interested the class. I never knew any lecturer more attended to, and there were few who did not take careful notes. He was very patient and kind to his attentive pupils; but I have often known him to reprove most sharply one whom he observed to be inattentive during his lecture, saying that he looked upon it as a personal insult. After the lecture he always invited any of the class to ask questions, and I have known him to be engaged for an hour in explaining what his pupils wanted to know.

I happened to be in Paris when Dr. Hall was there for a month, in the autumn of 1835. I was not then aware of his great reputation abroad, and was surprised at the manner

in which he was received by the masters of the profession in France; Magendie, W. F. Edwards, Milne-Edwards, Louis, Andral, and all the leading men, vied with each other in doing him honour.

It is so long since that I cannot recollect many circumstances which impressed me at the time; but I well remember the pleasure I had, with many other students, in attending the *soirées* at your house in Manchester Square, and the patience and kindness with which Dr. Hall used to explain to us his experiments on the nervous and circulatory systems with the aid of a microscope. Of his kindness to myself at that time and for the remainder of his life I have, and always shall have, a most grateful recollection.

Another grateful pupil says:—

Leek, Aug. 1st, 1857.

During my residence in London, I received more kindness and derived more information from Dr. Marshall Hall than from any other person. Since engaged in active practice, his views and suggestions are ever coming to my assistance. Pray inform me where I can obtain a likeness of my departed friend and master, that I may be daily reminded of one who will ever live in the grateful affection of, &c. &c., CHARLES HEATON.

I now add a few words from the letter of Mr. Amos Beardsley, of Ulverstone, which, indeed, with several others, was not intended for publication; but as it so truthfully depicts traits in the character which I am endeavouring to describe, I cannot refrain from quoting it.

Dear to me are the recollections of the many happy hours I passed in Manchester Square! During the three years (1841—44) which I spent in town, there was no privilege I valued more than the kind friendship of your dear husband. His unwearied interest in my welfare, his delight at my success, endeared him to me, and I valued his friendship as the greatest boon in my career.

It was gratifying to him to find that when his pupils settled in practice, they daily more and more felt the practical value of the truths and the peculiar views which he had taught them. I must restrain myself, or I could add many testimonies to this effect. A letter is now before me, addressed to him by Mr. J. Aston, who says :—

Oh that I had once more the opportunity of attending your lectures; I would not lose one single word of them! I have now had it in my power to put into practice and test your views on many points which were to me, and still are to the great mass of practitioners, very obscure. The whole of the little medical skill I possess was obtained from your lectures, and since, by daily consulting your "Practice of Medicine," which, I can truly say, has never once deceived me.

The writer then proceeds to comment upon the inestimable value of Dr. Marshall Hall's rule for the due administration of bloodletting, and his peculiar discrimination between inflammation and irritation, which have been already alluded to, and which he earnestly impressed upon his pupils.

In 1846 he resigned his office of Lecturer at St. Thomas's Hospital, as being too fatiguing and occupying too much time, and he never afterwards undertook a course of lectures, for those which he delivered at the College of Physicians can scarcely be so called. He, however, occasionally assembled a few students at his own house for physiological investigations, which is thus alluded to by one of their number :—

Dr. Hall was universally kind to all who were interested in the studies which so thoroughly absorbed his own attention. We remember well, and with much gratitude, his inviting to

his house two or three students from each of the principal medical schools in London, and devoting the whole of an evening, week after week, to the repetition of some of his experiments, and the instruction of this private class. He would, at once, perceive the difficulties which these tyros in physiology felt, and by clear statement and illustration solve them. He would ask questions which are not yet answered, but would suggest means by which the answers might be sought and found. He would stimulate inquiry, by pointing out lacunæ in the science; and he would dwell with enthusiastic admiration upon the beauty of a natural object, or with calm complacency on a discovered law. At all times he was the same instructive friend, and there are many who owe to him much of their real enjoyment in the search for physiological truth.

The value of a testimonial from him may be inferred from the following extract from the letter of Dr. Stanhope Speer, written just after having obtained a valuable appointment in Dublin:—

> The great instrument in this appointment was the testimonial *you* so kindly gave me. When laid before the Professors and Directors, I do not exaggerate when I say that they declared *that one* testimonial to be a host in itself; to you, therefore, my dear sir, are my most sincere thanks due.

Ever zealous in furthering to the utmost the prospects of others, his testimonials, whilst they were conscientiously truthful, bore the impress of a warm heart.

On four different occasions Marshall Hall was appointed to deliver a course of Lectures at the Royal College of Physicians. These consisted of the Gulstonian, in 1842, and the Croonian, in 1850 and the two following years.

The subject of the Gulstonian was—"The Mutual Relations between Anatomy, Physiology, Pathology, and Therapeutics, and the Practice of Medicine." The first course of the Croonian lectures was on "The Diastaltic Nervous System; or the System of the Spinal Marrow, and its Reflex Arcs, as the Nervous Agent in all the Functions of Ingestion and of Egestion in the Animal Economy." The second course, in 1851, treated of "Cerebral and Spinal Seizures of Inorganic Origin and of Paroxysmal Form, as a Class; and of their Pathology as involved in the Structures and Actions of the Neck." His third Croonian course, delivered in 1852, the last year of his remaining in practice, was upon "Apoplexy and Epilepsy; with Observations on Trachelismus, Laryngismus, and Tracheotomy; and the Proposal for a Hospital for Epileptics." All these lectures excited unusual interest, as containing the most valuable practical applications of his discoveries, and they were very numerously attended, the theatre being completely filled.

These lectures were arranged in one volume, with the title of "Synopsis of the Spinal System." Messrs. Longman & Co.

CHAPTER VIII.

MISCELLANEOUS WRITINGS.

In this chapter I propose to group together various subjects which engaged the attention of my husband at different periods between 1840 and the beginning of 1853, when he quitted practice. In doing this it may be better to observe chronological order than to attempt any classification of subjects.

The following extract from the biographical sketch, to which I have already made frequent allusion, so much more fitly describes the events to which it relates than anything which I could myself pen, that I transcribe it, with only an occasional necessary alteration of tense :—

A zealous advocate of medical reform, Dr. Marshall Hall was one of the first to join in the movement which took place in 1836, and resulted in the formation of the British Medical Association, under the Presidency of Dr. Webster, of Dulwich. Dr. Hall was immediately elected on its Council. The strife and contention almost inseparable from medical politics were not suited to his taste ; but a strong sense of right and justice urged him to lend his powerful aid to the operations of this Association, as often as his professional engagements and his scientific researches would allow. He was always an active and valued member of the Council, and was appointed to give the "Annual Oration on Medical Reform," in 1840. We wish we could place the whole of this elegant and admirable

discourse before the profession, as it shows, in a most lucid manner, what a *real reform* of all medical abuses ought to be. We can here only notice one or two points, and refer to the Oration itself, which was printed, and passed through two editions. After some preliminary remarks, he alluded to the grades and distinctions in the corporations, and especially in the College of Physicians, where the *religious distinctions* of episcopacy and presbyterianism had so long maintained a difference between the graduates of Oxford, Cambridge, and Dublin, and those of Edinburgh. To the former he allowed more literature, but he thought the latter were confessedly the more distinguished in the science of their profession. He then boldly pleaded his own *right*, both on the score of scientific research and honourable conduct, to the fellowship of his College, which up to that time had been withheld from him. He then asked—and he might well do so—"What do you deem the true and legitimate title to rank and favour in our profession? Is it the boy's empty doctorate? Are not, rather, lengthened and successful labours in the cause of our noble art and science? Then let me ask—Who of the fellows has this title more than myself? Who has laboured more assiduously, more perseveringly, more successfully? But if a high morality be requisite for entering into the fellowship, let me freely assert that there is not in thi world a motive which could induce me deliberately to deviate, in word or deed, from the strictest of all rules of morality—those of Christ himself." Then addressing the President, he added, "I think I may appeal to you, Sir, who have known me during so many years, for the truth of what I aver." He then viewed medicine as divided into three branches—1st. The Science; 2nd. The Art; 3rd. The Trade. He afterwards considered—1st. Its Honours; 2nd. Its Posts; 3rd. Its Emoluments; and after enunciating the principles of medical legislation, in accordance with those of the Association, he concluded in the following words: "Gentlemen, let me now earnestly beg you to pursue your noble and generous designs, nor doubt of ultimate success. Be united; let self be sacri-

ficed on the altar of the general good, professional and public; for these are indissoluble. Let a generous impartiality henceforth actuate our noble profession. Do away with every invidious distinction, and let real merit, talent, and industry, and successful research, receive their just reward, whoever the individual may be. JUSTICE is represented as blindfold, not seeing the person, and therefore impartial, weighing the deeds of men, and holding up the scales to the gaze of the world, and setting forth TRUTH for its admiration, its reward. And now, gentlemen, I think I may retire from all active participation in your affairs, with the consciousness of having done my duty. I shall, however, ever take a deep interest in your progress; your cause is one of JUSTICE, of TRUTH, in the highest sense of these words, and must prevail."

It was not till 1841 that the Fellowship of the Royal College of Physicians was offered to him. His independent principles had never been concealed. He had always spoken of the distinctions invidiously made at that institution as unjust.* But I again quote the same writer:—

Was Marshall Hall ever found seeking honours or rewards of any kind in any other way than by legitimate and laborious researches? No! He pursued the even tenour of his course perhaps more assiduously than any other member of the profession. Well might he ask, whose works and published papers have been so numerous, so various, and so important? and the list which we shall give of these is perhaps his greatest encomium! His ambition, with which he set out in life, was a legitimate ambition (would we were all imbued with it!)—one of noble pride, not of vanity; of justice and truth, not of favour or of praise; and we believe he enjoyed acutely the consciousness of having *deserved* well of science and of his profession.

am happy to state that the College is *now* constituted upon a more liberal basis.

He ever retained the most enthusiastic attachment to his profession—its science being the object of his highest admiration, whilst its mockeries and *quackeries* were the objects of his ineffable scorn. But this attachment was founded entirely on the view he took of it, as a pure science guiding a noble art,—all trade, trickery, and affectation, and every ignoble art, being removed as far from it as the poles are asunder.

We have heard Dr. M. Hall say, that if thereby doomed to poverty, he would nevertheless pursue science. But we have also heard him regret that Science, in our profession, unaccompanied by mean Art, is not duly and justly rewarded; yet that it is by Science alone that our profession can be exalted; that it is by solid scientific attainments that the country practitioner will take his place amongst the gentry and the clergy, and that our surgeons will raise themselves amongst the other officers of the army and navy. Knowledge *is* power, and must take rank sooner or later. The agriculturist should *thus* be driven to appeal to the profession, when questions such as those treated of by Liebig and Boussingault are under discussion;—and the Government, when the health of our forces or our cities is the object of inquiry. Science *must* lead to considerable, not to say great practice even, for all are not without discernment; and this degree of practice does not depend on accident, nor upon patronage. It is therefore more certain, more independent, and more solid, though, perhaps, not so aristocratic or *fashionable*, as practice of another kind.

Ever prompt to confer a public benefit, and ready to advocate the cause of the poor, Marshall Hall addressed a letter to the *Times*, on January 18th, 1845, under the signature of "Censor," representing the danger to health from the partially open second class carriages of the Great Western Railway. A poor widow had just been to seek his advice: in the severest weather her husband, obliged to travel by one of these carriages to Bath, caught a violent cold and

died. The letter of "Censor," which appeared on the 21st, was a forcible appeal, and within three weeks from its publication the carriages were closed!

In July, 1846, we find him again engaged in a public question, involving the interests of humanity. A soldier at the Hounslow Barracks died of internal disease, twenty-six days after receiving 150 lashes. The case excited a great sensation in the public mind. An inquest was held: the medical certificate had been to the effect that "the cause of death was in nowise connected with the corporal punishment," &c. On this occasion Dr. Marshall Hall addressed a letter to *The Times*, which was *immediately* inserted, accompanied by the following notice, which rendered its acceptance the more flattering:—

[We regret that it is impossible for us to give insertion to even a fiftieth part of the letters we receive upon the subject of the late death from flogging at Hounslow Barracks. Nearly a hundred letters a day upon this subject have reached us for the last week, and it would occupy a much larger portion of our space than the debates in Parliament permit us to appropriate to correspondence, if we were to publish even those only whose merit would in ordinary cases insure their insertion.]

THE PHYSIOLOGY OF FLOGGING.

London, July 27th.

Sir,—It may seem very hard if I say that the effect of flogging is not fully appreciated even in my own, the medical profession. But I have studied the subject, and I beg to send you a few medical hints upon it.

Every lash, like every other kind of laceration or cutting, affects the power of the heart. A patient sometimes never

rallies from the effect of a severe accident (such was the case with Mr. Huskisson) or a severe surgical operation.

But this is not all. The skin, which some persons seem to think may be treated like an inorganic substance, has a special relation with the internal organs:—

1. A current of air falling partially on the surface is sufficient by its action on the skin, and the sympathy of this, through the ganglionic system, with the internal organs, to induce inflammation of the lungs or of the heart, or of the membranes which cover these organs.

2. The same event occurs from burns or scalds.

3. The same event occurs from flogging.

It is not the *extent* of the infliction merely which is to be considered; much depends on the peculiarity of the constitution. The healthy are less affected than the unhealthy, the sober than the drunken.

But any person may, as the effect of any of the inflictions to which I have adverted, become *diseased—diseased for life*, or *diseased unto death;* and no man—no medical person—can tell, *à priori*, who is to suffer or who is to escape.

Flogging is not to be treated of, then, as a thing skin-deep. Many a soldier whom it was only intended to flog has been slain, unknown even to the inflicter of the punishment; for, as I have said, the medical bearings of the subject have not been duly investigated.

It is somewhat singular that those persons who seem to bear a surgical operation best are precisely those whom it affects the most, and most dangerously.

There are, besides, what we call idiosyncrasies, or peculiarities, which, besides the fact of ill-health or bad habits, render an infliction which might generally be borne without risk most dangerous.

In the tendency to disease of the brain, in disease of the heart, flogging would be dangerous; and this punishment has actually induced epilepsy and tetanus (or locked jaw).

I may refer to the writings of the late Mr. Rose* and Sir

* "Med. Chir. Trans." vol. xiv. p. 251.

C. Bell,* of Mr. Travers,† &c., for examples of internal disease, especially inflammation of the lungs, induced by severe accidents or operations; but if this be true in regard to the tissues in general, it is specially so in respect to the *skin*.

The great fact is, that as exposure to a current of air, so a burn, and so a flogging, may induce disease, lingering disease, and death. I am, sir (in haste), your obedient servant,

CENSOR.

A few days later he addressed a second letter to the same Journal, which was likewise inserted. I quote the whole:—

THE PHYSIOLOGY OF FLOGGING.

London, July 31.

Sir,—If the military surgeon wishes to appreciate the effects of flogging on the poor culprit, let him not stand afar off and look on, but let him draw near and keep his finger on his patient's pulse. At each lash he will find that pulse *falter!* The man may brave it out, may suppress all expression of pain under this modern torture; but, sir, his heart, both physically and psychically, *quails* under it, and the pulse tells the tale; ay, the heart sometimes so quails as to refuse to perform its pump-like office, and the silent patient turns pale and faints away!

I assert from positive knowledge, that each lash goes literally to the very heart, paralysing or enfeebling its action.

But, sir, it does not go to the heart only, but through the associated nervous and arterial systems, to every part of these, the most distant, the most minute, there inducing, not a mere transitory loss of power and action as in the heart, but a more permanent morbid condition—a state of disorganization commonly called inflammation, with its dire consequences—disease and death.

* Quarterly Reports, p. 241.
† "On Constitutional Irritation," vol. i. p. 145.

And now one word on the case of poor White. Before he was flogged he was drunken. This was known ; and it must have been equally known that drunkenness induces a state of system ill-calculated to resist the causes of disease. But, sir, before he was flogged he had suffered from inflammation within the chest. This might or might not be known, and that, you will perceive, is a part of my argument. White was not only prone to disease, but he was prone to the very disease within the chest of which he died.

On June 15th he is flogged to 150 lashes. The power of the heart was not immediately quelled; the poor man lived until his lacerated back healed—he lived to be thought fit for duty. Alas! the lacerations had been made through the skin, but the nerve and blood connexions of that skin had carried their influence deeper! The nerves and arteries of the lungs and of the heart, and of their protecting membranes, had responded, and morbid processes had set up and gone on during six-and-twenty days, making their wonted havoc, and eventually leading to the loss of life.

On the *post mortem* examination it is observed—

"Thorax.—Right side—old adhesion, binding the lungs to the ribs and diaphragm throughout its whole extent. Left side—inflammation of the pleura, with recent adhesions, and effusions of serum, containing shreds of lymph, to the extent of 12 ounces; lung engorged and infiltrated with serum ; heart and muscular tissue soft and pliable throughout; endocarditis on both sides of the heart, the inflammation extending some distance along the pulmonary artery and over the valves of the aorta; cordæ tendineæ of the tricuspid valve matted together with fibrin; pericardium healthy, and not containing more than its natural quantity of fluid."

I believe it is impossible for any one to read this detail without a suspicion, amounting almost to conviction, that injuries inflicted on the skin had acted, like other injuries inflicted on the skin or other tissues, and had induced fatal disease of the heart and lungs. The simple facts, their se-

quence, their connexion in point of time—all must lead to this conclusion. The idea of the man having taken cold is without proof, and the supposition a mere subterfuge; and I am confidently of opinion that the following certificate is unjustified by the facts of the case:—

"Having made a careful *post mortem* examination of private Frederick White, of the 7th Hussars, we are of opinion that he died of inflammation of the pleura and of the lining membrane at the heart; and we are further of opinion, that the cause of death was in nowise connected with the corporal punishment he received on the 15th of June last."

In sending you these reflections, I have no object, Heaven knows! but to state the truth; but I confess I hope that the effect of that truth will be to abolish a system of punishment derogatory at once to the military officer, to my own profession, and to the soldier, and, as I think, and to say all in one emphatic word, *un-English!* I am, sir, your obedient servant,

CENSOR.

In July, 1845, being already an honorary member of some of the principal medical societies on the Continent and in America, Dr. Hall received from his friend M. le Docteur Louis, the following announcement of his election as Foreign Associate of the Royal Academy of Medicine of Paris:—

C'est moins que rien, mon cher ami; mais c'est au moins un souvenir d'amitié, adressé à la science profonde; un témoignage d'estime donné par un corps savant à un homme fait pour l'honorer; enfin, mon cher ami, pour cesser ce style d'énigme, l'Académie Royale de Médecine de Paris vous a nommé aujourd'hui l'un de ses *Associés* étrangers; *Associé* —non pas simplement *Correspondant* étranger; ce dernier grade n'eût pas satisfait mes vœux à beaucoup près. C'est bien peu pour vous, mais l'Académie ne pouvait pas faire plus. Et puisqu'il s'agit d'Académie, je dois vous dire qu'ayant dîné avec M. Flourens, et côte à côte, nous avons beaucoup parlé de

vous. Le Secrétaire Perpétuel de l'Académie des Sciences vous aime et estime beaucoup, et je ne lui ai pas dit qu'il avait tort.

Faites nous savoir de vos nouvelles et, en attendant, recevez des notres : elles sont toujours bonnes ; nos santés sont presque aussi inébranlable jusqu'ici, que nos cœurs vous sont attachés—&c. &c., LOUIS.

Possessing an essentially logical mind, it was natural that Marshall Hall should show a taste and an aptitude for mathematical questions. That originality and spirit of research, too, which he carried into every investigation, led him to examine for himself received ideas, even in this science. Thus he wrote some brief remarks "On the Idea of Form to be attached to the Higher Powers of Numbers, and on the Signs used in Algebra," which were inserted in the *Mechanics' Magazine* for August 26th, and September 30th, 1848, under the signature of Ιατρομαθηματικος. These papers attracted the attention of an able professor of mathematics, who said that there was much in them "to suggest thought and further inquiry."

On a classical subject, also, an idea occurred to him : in the study of the elementary forms of the Greek nouns and verbs, he proposed new forms ;† these were approved of by the late Dr. Donaldson, the distinguished author of "The New Cratylus."

* In 1835 M. Louis dedicated his work, "Sur les Effets de la Saignée," to Marshall Hall.

† He showed that the nouns might be declined on models presented by the article ὁ, ἡ, το, the pronoun τις, the numeral εἷς, μια, ἑν ; ὁ and το present the model for Declension 1 ; ἡ and μια for Declension 2, and τις, εἷς, and ἑν for Declension 3. Of these forms he constructed an interesting table. He also drew up a form of the Greek verb, considered very superior to those used in schools under the designation of Greek trees. These tables were printed for private circulation.

It has been remarked that, "nothing is sublime except to a man who possesses in his own mind at least somewhat of the elements of greatness." Perhaps it requires the possession of genius fully to appreciate genius. Marshall Hall was an ardent admirer of Harvey, and had often wished to make a pilgrimage to the tomb of that great man. His character was by no means devoid of a certain tinge of poetic feeling. It is a great mistake to suppose that the man of scientific genius is a dry, cold, hard being; on the contrary, he usually possesses "that exquisite sensitiveness which is often found among men who are capable of great deeds." Sir Humphry Davy was a poet as well as a philosopher. The following narrative, written by my husband, speaks for itself:—

A VISIT TO THE TOMB OF HARVEY.

September 17th, 1848.

On this day, we—that is, my wife, myself, and my son—walked from Saffron Walden, where we had met—two of us from London, the third from Cambridge—on the preceding evening, to visit the tomb of Harvey at Hempstead. The distance was seven miles, the day was beautiful, and during half our pilgrimage the pretty church of Hempstead was in view.

We were first conducted to a part of the church devoted to marbles commemorative of the family of Harvey. One especially recalls to our memory one of the heroes of Trafalgar, the gallant Commander of the *Téméraire*. But we were, of course, engrossed with that of the immortal discoverer of the Circulation himself, whose resting-place we had made this pilgrimage to visit.

We descended into a spacious vault, divided into two

chambers, each containing a number of coffins, most of them lead. On one of these we read the following words :—

Dr. William Harvey, died on the 3rd of June, 1657, aged 79 years.

A passing feeling of sympathy with the character, the joys, and cares of the immortal dead, and then an abiding one of veneration and of awe, came over me. I scattered a few wild flowers, which I had gathered purposely on our way, over the bare coffin; a moment of contemplation and reflection, and we left this region of the science-and-time-honoured name! I observed my wife to stop and gather several of the flowers and to scatter them anew!

One day——but this paragraph I leave my reader to fill up.

My wife accompanied my son to Cambridge; the latter is preparing to enter Gonville and Caius College—the college of Harvey. The next day I travelled homewards alone, and on this journey I penned this simple narrative.

May this visit inspire my boy with an ardent desire to imitate, at whatever cost, that great ornament of our profession! As to myself, I can but recall to mind the words of Correggio, as he contemplated a work of Raphael—"ed *io* sono pittore!"

As we returned to Walden, the sun was declining before us, and we incidentally touched, in our conversation, on the effects of exercise upon the circulation and respiration, reasoning thus :—

Every contraction of a muscle compresses the veins in its substance; but these veins are furnished with valves; the contained blood is therefore propelled onwards towards the heart; this organ is stimulated to greater and more frequent action; the blood is propelled onwards through the pneumonic and systemic arteries; in the lungs, as in the general system, it pervades the canals of irrigation, whence carbonic acid is the more freely exhaled; this, in its turn, excites the pneumogastric nerve, and this excitation leads to more frequent respirations; these again arterialize the blood; hence the physiological relation between the number of pulsations

and of respirations, the augmented stimulus and diminished excitability and irritability during the state of activity; the restoration of these latter, with the diminished degree of the former, during repose!

How do a myriad of other facts, physiological and pathological, flow from these plain but important principles!

If we did but set the example of Harvey before our eyes continually for imitation, how would our profession be exalted, and how would every ignoble and derogatory idea and proceeding vanish! But with the good, it seems that evil must needs be commingled, and the race of the Primeroses, the Parisanuses, and the Riolanuses,* is, alas! not yet extinct!

As we descended into the valley from Radwinter, the sun set and the atmosphere was foggy, chill, and damp; but as we approached Saffron Walden, we emerged from the local cloud and reached our inn in the clear and cheerful twilight!

Φυσιολογος.

Was a figurative and prospective sense attached to the concluding paragraph in the mind of the writer? I incline to think so.

The next subject, not strictly medical, on which we find his pen employed, is a letter addressed to the Earl of Rosse, President-elect of the Royal Society, in November, 1848. In the preceding year, a paper detailing an important investigation in reference to the nervous system had been presented by him to the Royal Society, ten years after the rejection of his "Second Memoir on the Spinal System," charitably hoping that the temper of that learned body towards him might have undergone some amelioration during that decade. This hope was not realized. The "Phi-

* Opposers and persecutors of Harvey.

losophical Transactions" were still hermetically sealed to his contributions. I have already briefly mentioned these facts, and merely allude to them here, to explain the motives which induced him to address a letter, printed for private circulation, to the President of the Royal Society. This letter—brief, dignified, and temperate—enumerated the wrongs which the Council had inflicted upon him. Two years afterwards his name was placed upon the Council—a tacit admission that his letter had not been without its effect.

The *Lancet* of November 23rd, 1850, makes, in a leader, the following comments:—

It gives us great pleasure to observe the name of Dr. Marshall Hall in the house-list recently issued for the election of the Council of the Royal Society on the 30th instant. It is a satisfactory, though tardy acknowledgment of the great and meritorious services rendered to physiological science by this distinguished physician. We take the opportunity of remarking, that the changes which have occurred at the Royal Society within the past two or three years, form the most splendid tribute perhaps ever offered to the power of fearless and independent journalism. The part taken by the *Lancet* in these events is one of which we may well be proud. They also bear testimony to the indomitable power of truth in eventually over-mastering all opposition to its progress, from whatever source arising, from interest, from prejudice, or from ignorance. In 1837, a paper, containing a new and important truth, is unjustly refused a place in the "Philosophical Transactions." This wrong smoulders for years, and remains unredressed. In 1845, a second grave injustice is committed—Truth was insulted, first in the person of Dr. Hall, and then in that of Dr. Lee. But, mark the result: the truths established, spurned and degraded in the eyes of Europe as far as

they could be by official conduct, rise up with such power that they shake the Royal Society more than it had been shaken by any other events during the two centuries of its existence. They disgrace the actors who had sought to throw contumely upon them, and successively they remove from power the most securely-seated Secretary which the Royal Society ever possessed; they dethrone an eminent, if not a popular President;* they reform the Council, and they destroy altogether the Committees which had been the engines of wrong and mischief. Well might the Roman orator exclaim, "O magna vis veritatis!"

In the following year another subject of public utility engaged my husband's attention. The fatal mistakes which sometimes occur in the dispensing of medicines led him to make the following suggestions; they were published in *The London and Edinburgh Monthly Journal of Medical Science* for January, 1849:—

Suggestion of a National Decimal Pharmacopœia. By MARSHALL HALL, M.D., F.R.S., &c.

Very many years ago, a druggist's apprentice in Newark sold, by mistake, a powder containing opium for one containing jalap; the colour, and the position on the shelves, of the two powders, being nearly the same. The medicine was destined for a child. The mother came shortly after its administration, in the utmost consternation, to say that the little patient had fallen asleep and could not be roused.

Galvanism was then in the ascendant; and I went with an early friend, R. Cooke, Esq., of Gainsborough, taking the galvanic apparatus. The child was restored!

A few weeks ago, three grains of strychnine were, in the same manner precisely, sold for three grains of salicine: the effect was instant death to the unhappy patient.

* The predecessor of the Earl of Rosse.

It is, of course, impossible by any act of legislation to guard against such carelessness. But these facts afford an additional argument for the proposition which I am about to bring forward.

It is impossible to look over our Pharmacopœias without feeling that their complexity and diversity are very serious, as they are very unnecessary obstacles, in the way of the student and practitioner of medicine.

As to the student, his memory is taxed to the very utmost before he can venture to appear before the examining boards. The practitioner is not less "let and hindered" in his daily career of prescription.

An English physician would scarcely know how to prescribe in Edinburgh or Dublin; and even in England he will sometimes find it difficult to prescribe certain important remedies, the hydrocyanic acid for example, in a manner at once efficacious and safe—a difficulty which is increased on the introduction of any new remedy or remedies. In a word, no principle guides us or guards us in this most important department of our art. In order to set forth the defectiveness of our present Pharmacopœias, I need only advert to those preparations, each containing opium—the pulvis cretæ compositus cum opio, the pulvis kino compositus, the pulvis ipecacuanhæ compositus—not, however, in the same proportion, but in that of one-fortieth, one-twentieth, and one-tenth! It is the object of this very brief paper to suggest such a principle—a principle which which will become, I think, of equal utility to the student and the practitioner, and safety to the patient, under all these varied circumstances. It is that of a uniform Decimal Pharmacopœia in all the British dominions.

The first step to be taken will be to get rid of the varied modes of determining *quantities*. If we would attain accuracy, these must be limited to one, viz., *weight;* all other modes, such as that by *drops*, and that by *measures*, being discarded altogether.

Our next step is to discard all the confusion, even in regard to weights, which has so long prevailed, especially that

between avoirdupois and apothecaries' weight. In vain is one weight cast circular and the other square. I am persuaded that, to this day, one ounce of the one is confounded with one ounce of the other, and this is a confusion between 480 and 437 grains.

But let *one grain*, however this may be determined, be the *unit*, and let the greater weight be *ten, one hundred, one thousand, decem, centum, mille*—progressive multiples of that unit.

But especially let the officinal preparation of each energetic, and therefore dangerous remedy, solid or fluid, be such, that the medium dose shall be one grain, or more frequently ten grains, or one unit or decem by *weight;* that of others, as the tinctures generally, the infusions, &c., being such, that 100 grains or nearly $\frac{1}{4}$ oz. (℥i ℈ij) a centum, 1000 grains (℥ij ℈ij) or a mille, or nearly two ounces respectively, may be at once an efficient dose. The phials containing each of those distinct *orders* of preparation should be of *proportional* size; and those of each *order* should be arranged together, and distinctly from the rest. Every means should be adopted which can avert mistakes and danger.

Lastly, let the number of grains, or the terms decem, centum, mille, or millia, be written instead of those remains of antique darkness and mystery, ℈i. ℥i. ʒi. Ten grains are a medium dose of the pulvis ipecacuanhæ compositus. All other important remedies may, like the opium and the ipecacuanha of this preparation, be so mingled with some appropriate inert substance, as to make the medium dose *ten* grains or one *decem*. The medium dose of the officinal preparations containing the chloride or the bi-chloride of mercury, of arsenic, of morphia, of hydrocyanic acid, and of strychnine, should, in like manner, be ten grains by weight. The same rule will apply to all the metallic salts, to iodine and the iodides, to the alkaloids, and to every remedy of energy and power. In like manner the medium dose of the liquor hydrargyri bi-chloridi, the liquor potassæ arsenitis, the tinctura opii, the acidum hydrocyanicum, should be *ten* grains.

If now a mistake be made in the hurry of prescription or of composition (and who is infallible?) no fatal or injurious consequence can follow. No one will be afraid of prescribing the ascertained safe or medium dose of the most powerful medicines even, his sanction, in the case of any untoward peculiarity of constitution, being the authorized Pharmacopœia, founded on the experience of the most experienced in the profession. Each practitioner will, of course, judge whether, in the case of the delicate and the young, a minor dose than the medium dose should be first prescribed.

It may also be a question for careful consideration, what modification of the plan proposed may be required for infants and children. The plan itself will require the alteration and modification of the whole Pharmacopœia; but no great good is ever obtained without a proportionate effort. A principle, at least, will be introduced into our national Pharmacopœia for the first time. There is nothing in this arrangement of the Pharmacopœia to curtail the just freedom of prescription or of commerce, only I would distinguish the pharmacy from the warehouse and the shop.

CHAPTER IX.

PLAN FOR THE SEWERAGE OF LONDON.

THE following observations are from the pen of my son:—

One of the most remarkable and brilliant generalizations which my father gave to the world, appeared in the form of a pamphlet entitled "Suggested Works on the Thames," the date of which is 1850. A second edition was subsequently published in January, 1852, and additional matter added in 1856.

As many portions of the plan have been carried out, not only in London but elsewhere, and other portions are now in the course of adoption, it is only right again to lay the whole of the pamphlet before the public, and to let the date of its *first* issue speak for itself with regard to the priority of the suggestions it contains.

No one would be more delighted than my father, could he now see the extent to which his plans are being adopted and developed; but I cannot refrain from giving the touching lines of the Latin poet—

Sic vos non vobis nidificatis aves,
Sic vos non vobis vellera fertis oves,
Sic vos non vobis mellificatis apes,
Sic vos non vobis fertis aratra boves.

PRINCIPLES OF THE SEWERAGE OF LONDON AND OTHER LARGE CITIES, WITH SUGGESTED WORKS ON THE THAMES.

PREFACE TO THE SECOND EDITION.

Would not our two millions have been better spent in preparing for the cholera, which is marching from Warsaw to visit our undrained streets and crowded courts?—*The Times*, August 12th, 1852.

Should the Thames Railway-Circuit, suggested in the following pages, be accomplished, it will unite the great districts east, west, north, and south of the metropolis; and, when brought into connexion with the existing northern and southern railways, will bring these districts, and every suburban district, together, and to the New Crystal Palace.

But if the execution of the project of a Thames Railway-Circuit be delayed, the sewage may still be conveyed from the lowest points of the cloacæ, at or below Shadwell and Rotherhithe, by means of sewage-waggons, along one or more branches, to the nearest railroads, thence to others, and thence over our most distant corn-fields, with the utmost facility.

The true principle of the sewerage is set forth in § 9, p. 185; the plan proposed is the *only* one preserving the *fluid* excreta, so important in Agriculture.

The great question of the Sewerage of London may be considered as mainly solved. In its greatest simplicity, it consists in—

1. A *distinct* Excreta and Water-Sewerage;

2. A *Cloaca* placed on each side of the Thames, under low-water (and within the Thames Tunnel?), to receive the *excreta;* 40,000,000 out of the 45,000,000 of gallons of *water* which percolate London daily, being allowed to flow into the river;

3. *Sewage-waggons*, as in Paris, but on a larger scale, to convey the excreta from the cloacæ to and along the railroads, and to our fields; the importation of guano and of

foreign corn, and a duty on corn, being rendered equally unnecessary. (See p. 190.)

In this project there is nothing, either in structure or expense, to deter; and the metropolis, the Thames, and the atmosphere will all be kept pure. Add sub-surface drainage, and cholera and other visitations may be disarmed, and Rotherhithe become as little fatal as Hampstead.

In PARIS, both the *cesspools* and the *voiries* may be abolished; Montfaucon and Bondy will cease to be foci of every noxious vapour!

SUGGESTED WORKS ON THE THAMES.

The writer's attention was first drawn to the subject of the following paragraphs by the consideration of the all-important SANITARY questions of the sewerage and of the drainage of London; he has been gradually led on to contemplate and suggest the more complicated project about to be described, which he submits to public opinion at a moment when the propositions for a *central* railroad station in the metropolis, for a new street in the City, and for a new bridge across the Thames, are under discussion.

The project combines the objects of such a station and of the sewerage and drainage, and especially of the purity of the river and of the atmosphere, in a plan for extensive works occupying a space within the borders of the Thames. To these objects, those of a new thoroughfare in the heart of this great and crowded city, and of a new bridge across its river, are also added. And whilst these objects are accomplished, further projects for the *conveyance* of an abundant supply of water, and the *removal* of the sewage, and its *distribution* as manure over our fields, are laid before the reader.

Several events may, indeed, be regarded as impossible:—

The *first* that London, with its two millions and a half of inhabitants, be allowed to remain without an adequate supply of pure water;

The *second*, that this great city be allowed to remain without a perfect system of sewerage and of drainage;

The *third* and especially, that Southwark and Bermondsey and Rotherhithe, and other low districts be allowed to continue entirely without *sub-surface drainage*, as distinguished from house-drainage, surface-drainage, and sewerage;

The *fourth*, that the sewage of London and other great cities of England be permitted to *continue* to pollute its rivers and its atmosphere, to the detriment of the public health;

The *fifth*, that this sewage *continue* to be lost to the soil of England as manure, to flow down the Thames to be replaced by an equivalent of guano—if, indeed, it be an *equivalent*—and to be brought up the river again on board our ships, at a yearly cost of more than one million sterling;

The *sixth*, that this metropolis remain without a general station for its railways;

The *seventh*, that sufficient thoroughfares be not provided through its centre and across its river.

It is the COMBINATION of these objects which characterizes the following suggestions. The aim of the writer is to *utilize* what we possess, and to *simplify* the whole question of sanitary, agricultural, and commercial arrangements in the utmost degree: the *same* railways, especially, which bring cattle and corn *from* our fields, may be made to *restore* them to the same fields in the altered form of sewage or manure, whilst the other objects which have been enumerated are also secured. These will now be very briefly discussed *seriatim*.

1. *Of a Thames Railway-Circuit.*

The *first* object which the writer has to suggest, is not a *central*, but a *circuit station*, connected with all the railways of the metropolis. This it is proposed to accomplish by carrying two or more branches from the existing railroads, along tunnels or otherwise, to the banks of the river; and then to connect these by means of a circuit-railway, erected on Doric (and surmounted by Corinthian ?) columns WITHIN those banks,

above high-water mark, on the north and on the south, and *across* the river on the east or west side of London Bridge, and on the north or south side of Westminster Bridge.

A railroad already nearly encircles London, joining or crossing the Blackwall, Eastern Counties, North Eastern, Great Northern, North Western, and Great Western railways. From any two or more of these *lines*, the *rail* may be continued to the *Thames Circuit-railway*, whilst they are made to communicate with each other. The southern railways are already brought nearly to the water's edge.

The objects, of course, are economy and utility. On this latter point, it may be observed that the *circuit-railway* may be viewed as CREATING *two* NEW THOROUGHFARES, and *two* NEW BRIDGES, in the heart of this great city, and as removing the carriages most pressed for speed—that is, the sources of the greatest inconveniences and impediments—from its too crowded streets; and this at a moment when directions have actually been given for estimates of the expense of making a new street and a new bridge, at the sacrifice of immense properties: for—"The City Improvement Commissioners have given the occupiers of the houses in St. Thomas Apostle, Bow Lane, Great and Little Distaff Lane, and the other thoroughfares lying between Queen Street, Cheapside, and the south side of St. Paul's Churchyard, notice that these dwellings will be required to come down forthwith, in order to complete *the new street from London Bridge to St. Paul's.*"* *This sacrifice need not be made.* The circuit-railroad will accomplish the end proposed.

The railway-circuit will be less expensive and more efficient than any central station. The space for its erection is free. The extended station will be more convenient to persons residing in different and distant parts of the metropolis; and there will be less crowding of carriages.

It is to be remembered that any *central* railroad must *add* to the crowding of thoroughfares already too crowded; an inconvenience which no new *street* can avert.

* See "The Household Narrative," vol. ii. p. 256.

2. *Of a Thames Border-Cloaca.*

The *second* part of the writer's proposition, is that all the *sewers* of the metropolis be made to terminate in a cloaca placed *under* the level of low-water, and as much lower as may give the necessary *fall*, extending along each bank of the river; *e. g.* from Chelsea to Limehouse. These cloacæ must be of dimensions to receive all the more solid parts of the sewage of twenty hours. They may consist of cylinders of iron, divisible into compartments, so as to admit of being cleaned and repaired separately; for which purpose also they must be placed within sufficiently spacious mason-work, which may also constitute the *foundation* for the Thames railway-circuit.

3. *Of Sewage Railroad-Carriages.*

The writer's *third* proposition is—to institute a *night-service* along the railways, to commence its operations after the departure of the evening mails; to empty the cloacæ of their more solid contents into covered waggons, and to carry these contents to parts of the kingdom more or less remote, their more solid matters having been allowed to subside in the cloacæ, whilst the sewage-water only is allowed to flow into the river. (See § 9.)

These waggons may be constructed in some degree on the model of those used to empty the cesspools of Paris, of which a sketch is given by Mr. Rammell, in the "Report of the Board of Health," App. No. IV., p. 10. They may be taken along the railways to any desirable distances from the metropolis, and then along *offsets* from those railroads to any desirable spots to suit the convenience of the agriculturist, and even to the *fields* themselves. (See Note, p. 190.)

4. *Of a Sub-surface Drainage.*

House-drainage and surface drainage, and the sewerage, have abundantly occupied the attention of the Board of Health. There is one most important topic which has, I think, been overlooked: it is that of *sub-surface drainage.*

It is impossible, even on a cursory glimpse of Mr. Grainger's interesting map of the devastations produced by the late

cholera in London, not to be struck with the dark and fatal region, comprising Southwark, Bermondsey, and Rotherhithe, in which the mortality was 164, 189, and 203 in 10,000 respectively, that of Hampstead being 8 only! Is it possible that regulations for remedying such an evil should still be neglected? And yet, in *one* particular, they are *entirely* neglected!

It is true that this district is partially supplied with *sewers*. These carry off the excreta of man and animals, and the *surface* filth. But this district was, and indeed is still, a marsh; it is situated as low as high-water mark; and yet, strange as the assertion may appear, it does not possess a single *drain*—a single *sub-surface* drain of its marshy *soil!*

The great question then arises—How is this extensive and populous district to be *drained?*—for until this be accomplished, the *very first step* towards its sanitary improvement is not taken, and it will present as DARK a spot on each future map of cholera as ever! That darkness is chiefly in proportion to the *lowness* of the district, that is, to the level of the sub-surface water.

A sub-surface *drain*, as distinguished from a sewer, consists in pipes so arranged as to allow the water of the soil to pass into them and be carried away. *Such a drain does not exist in London.* That is—London is not drained!—the marsh of Southwark, Bermondsey, and Rotherhithe is not drained! The higher districts do not require such drainage; their sewerage is sufficient; but the marshy districts, to which I have adverted, require sub-surface or land drainage as much as any land to be reclaimed from the marshes in England.

It may be a question whether a new system of sub-surface *drains* must be established in the districts marked *black* in the cholera maps; or whether the present *sewers* may be replaced by pipes with a slit at their upper surface, and so calculated to perform the double office of sewerage and land-drainage.

It is also impossible not to be deeply interested in the researches and illustrations relative to the sanitary condition

of the districts north and south of the Thames, by Mr. Farr. They are perfectly admirable.

To the topics noticed by Mr. Farr, one other must be added. It is the *sub-surface* high- and low-water marks, observed in cellars, wells, and especially in borings made for the purpose. The result would, I think, yield numbers which would give the mortality from cholera directly, more nearly than those of the "elevation of the ground in feet above Trinity high-water mark," inversely. Thus, in the following table, in which *e* represents this elevation, Rotherhithe and Bermondsey are each on a level with high-water mark; the mortality from cholera, marked *c*, is 205 and 161, respectively, as given by Mr. Farr; and whilst the height, or rather depression, of Newington is 2 *below* high-water mark, the mortality from cholera is only 144. The distance from the river, and especially the sub-surface water-mark, may possibly give the explanation of these facts. The general mortality between 1838 and 1844 is denoted by the letter *m*.

London.	North side of the river.	South side of the river.	Hampstead.	Rotherhithe.	Bermondsey.	Newington.
39	51	5	350	0	0	— 2
62	41	120	8	205	161	144
252	251	257	202	277	264	232

It is, in reality, the want of *drainage*, not merely the defect of *sewerage*, which renders Southwark and other *low* localities, so liable to the ravages of cholera. And yet, on *this* point, not a word has been said *distinctly*.

To the tidal sub-surface inundation must be added the *waste* water, the escaped sewage, &c.—the effect of imperfect house-drains, sewers, &c. The influence of all this on the well-water, on the cellars, on the lower kitchen; on the foundation brick-work; on property and on health, may be readily imagined.

An examination of this question experimentally, comparing the sewerage, the surface levels, the sub-surface soil, the height

of water constant and tidal in borings, the hygrometer at various heights above the surface, &c., is imperative on those who have the direction of our sanitary arrangements.

5. *Of a Tide-excluding Wall.*

Nor will mere drainage be sufficient: at each high tide the sub-surface soil is inundated by the waters of the river. This must be prevented; an object which may be accomplished by a WALL, having its foundation deep beneath the surface of the lower clay on which this soil and subjacent gravel repose. The mason-work of the cloaca or cloacæ may be made to serve this essential purpose. It may be designated the *Tide-excluding Wall.*

To construct this wall is *the essential preliminary step* towards draining the lower districts of London, whether we refer to sub-surface, surface, or house-drainage; and the writer is not aware that such a step has ever been contemplated!

6. *On the Quantity of the Sewage.*

The quantity of cattle, of corn, of green vegetables, &c., introduced into London, must approximately represent the quantity of the sewage. If that of the former be not too great to be introduced, that of the latter cannot be too great to be exported. And the number of vehicles bringing the former will afford an idea of the number of closed waggons which will be required for removing the latter.

The solid sewage of Paris is conveyed to two principal *voiries*, at Montfaucon and Bondy. That of London may be conveyed to any number of *voiries*, at any distance from this metropolis, and thence to the fields of England, without the unnecessary change into *poudrette.*

7. *Of Railroad Water-Pipes.*

Whatever may be the *new* sources of water brought to the metropolis, it may, henceforth, be conveyed along pipes, the level and foundation for which may be found ready constructed in those of the railroads themselves, which may thus become aqueducts as well as viaducts.

8. *Of Sewage-water Pipes.*

Whatever the *quantity* of water brought into London, by the present or future arrangements, it may be removed by constructing return pipes in sufficient number and of sufficient size; and for these the *foundations* are also already prepared! For every "*artery*," a corresponding larger "*vein*" (on account of rain, &c.) must be provided. The former may bring the supply from each nearest source; the latter must be discharged into reservoirs sufficiently remote and the most convenient to the agriculturist. The questions of the supply of water and of the sewerage are thus combined, and may be consolidated; results so emphatically recommended by the Board of Health; see Report for 1850, p. 323, &c. (See § 9.)

The difficulty, in this matter, is to dispose of the sewage-water, when reconveyed into the country. Fields irrigated by this fluid would become fertile beyond all imagination. But how is this to be accomplished? The quantity of this sewage-water is immense, being 45,000,000 of gallons per day (of which, indeed, two-thirds, at present, are *waste*)—"Report of the Board of Health," 1850, p. 127—and the rain-fall. It may be impossible to dispose of it on our fields. It *must* then, I fear, after the subsidence of the solid matters, be still allowed to flow into the river! "Neither the scheme of Mr. Robert Stephenson, nor any one of the others, adverts to the means of carrying away the soil-water, as a subject which had at all entered into consideration."—Report, &c., p. 270. (See § 9.)

If then, as I fear, the sewage-water must continue to be lost to agriculture, it may be allowed to flow from the surface of the contents of the cloacæ, by means of pipes arranged along and above them, at different points, especially low down the river, *e. g.* below Shadwell, and into the middle part of the river.

This flow being continual, no putrefactive fermentation will have taken place—a fact, the inference from which will occur to every one.

The more solid matters will gradually subside and accu-

mulate at the lowest part of the cloacæ, whilst the more fluid are continually flowing into the river.

In this manner, although *all* that is desirable is *not* accomplished, yet the plan is defective only by a comparatively very small quantity; and this defect may one day be removed by some happy suggestion.

9. *Separation of Excreta from Drainage.*

This difficulty remained, until it was removed, as the writer believes entirely, by the suggestion of his son. This suggestion is—"to keep the excreta entirely separate from the drainage, causing them to flow from the water-closets through distinct pipes to the cloacæ, whilst forty millions of the forty-five millions of gallons of water introduced into London daily, are allowed to flow separately into the river; in a word, to keep the water-closet system and the sink-system, the sewage and the drainage, *distinct.*"

This appears, indeed, to be the one great essential and effectual principle of the sewerage!

10. *Of a Thames Carriage-Road.*

One thing still remains to be suggested. It is the establishment of a *carriage-road* within the Thames railway-circuit, by adding to the width of the structure on which the proposed railroad-circuit is placed, towards the middle part of the river, and forming a *road* for light carriages. Whilst the railroad passes *under* the side arch of each bridge, this street-road may rise and join the level of its upper surface, effecting at once a transit across it, and a communication with the streets leading to it and from it! This arrangement will apply to Waterloo, Blackfriars, and Southwark Bridges, if the railroad pass on the west side of London and the north side of Westminster Bridges; or the carriage-road may join, without crossing, London and Westminster Bridges, if the railroad pass along their eastern and southern sides respectively, which is, of course, most desirable.

This is, however, no essential part of the writer's plan. But it is one worthy of the most serious consideration.

A space may be left between the otherwise connected rail-road and carriage-road for the admission of light; &c.

11. *Of a Consolidated Work and Fund.*

In the effectual accomplishment of these objects, *travelling*, and especially *traffic*, on and over the river, will be induced to an almost incredible extent, and create a revenue which alone would pay interest on the capital employed, and gradually refund, if desirable, that capital itself. To this revenue, that accruing from the manure, and now expended in guano, will be added, and the outlay may be refunded in a very moderate space of time, after which the profits, like the advantages, will be immense.

Or, the whole arrangements of water supply, of sewerage and drainage, of manure, of travelling, and of traffic, may form one unique consolidated work and FUND, and constitute a secure investment of property which will be of great advantage to the public. At the same time, an efficient supply of water to our cities and of manure to our fields; the purity of our atmosphere and of our river; the sub-surface drainage of every low district; and the conveniences of an extended rail-road station in London and of new thoroughfares, will all be secured.

12. *General Observations.*

The great *railway-circuit* will connect all the railways and distant parts of the metropolis for travelling and for traffic, far more effectually than *any central* terminus. The cloacæ will receive the sewage and preserve both the atmosphere and the river pure and free from filth and pestilence. The night-service will not only convey such offensive matters away, but lead to their being spread as manure over our fields, augmenting their fertility and producing corn and herbage!—preserving from waste a vast source of national wealth, the extent of which may be learnt from the works of Liebig.*

This manifold object will be accomplished, too, without

* See note, p. 190.

augmented expense: at the station itself, not a house need be removed; the outlay and the cost of repairs will, as has been stated, be repaid by the conveyance of passengers and of merchandize, and by the value of the manure to our agriculturists.

There need be no nuisance even: the cloacæ may be emptied into *close* waggons, by means of *close* pumps and pipes (worked by the same steam-engines which move the trains?) between the times of the *down*- and the *up*-mail trains—consequently during the night.

The proceedings on the Thames and its banks need not be interrupted, nor need any property or present advantage be sacrificed. The *rail-circuit* will be constructed *above*, the cloacæ *below* the surface of the water, and both sufficiently *within* those banks. The former may constitute a beautiful COLONNADE and *healthy* promenade, making our river peerless in the world. The latter may present a specimen of the useful in architecture not to be found elsewhere—not equalled by the famed Cloaca Maxima of Imperial Rome.

The preceding pages have been submitted to one of our first engineers,* and I have been favoured by a note containing the following paragraph:—

"I think there is much in the plan that is unquestionably good, useful, and grand."

But the same high authority suggests the difficulty of carrying railways, roads, or quays along the banks of the river, on account of the vast interests involved.

It must be repeated—that it is not "*along*" the banks, but entirely WITHIN the banks of the river, that it is proposed to erect the *railway-circuit*, and to place the great cloacæ; and that not a house, or wharf, or interest of any kind need be sacrificed; that the value of all this property and of all these interests will, on the contrary, be *augmented* in proportion to the increased facility of transport—a collateral result of the plan of great value. The railroad-circuit may be

* The late Mr. Brunel.—*Ed.*

erected so much *within* the banks of the Thames, as to admit of the action of *cranes*, &c.; and so much *above* high water, as to admit of the passing of *barges*, &c.

The writer has caused several inquiries to be made of persons having property or works on the banks of the river. It has been uniformly stated that the project which has been detailed would add to the value of the former and facilitate the operations of the latter. It may be carried out, indeed, with especial attention to these as collateral objects, a survey of the banks of the Thames being first made.

38, Grosvenor Street, Jan. 1852.

13. *Suggestion of a System of Return-Sewers.**

I will now imagine that all my proposition beyond that of establishing Thames Border-Cloacæ (p. 180), be rejected. It still remains for me to propose, *first*, a *System of Return-Sewers* from those cloacæ, to convey the sewage (see § 9), by engine-power, to *closed* reservoirs, established at convenient distances from each of the great railways, from the metropolis, and from all habitations; and *secondly* a *System* of *Closed Waggons* from each of these reservoirs to convey the sewage along an offset from each adjacent railway, and eventually along that railway itself, to the desired distances of 50, 100, or even 500 miles from the metropolis, by a night service, between midnight and the dawn of morning, daily.

Even in this simple manner, the health of the metropolis may no longer be sacrificed; its sewage no longer be lost to agriculture; bones and guano no longer imported at an immense expenditure.

THE FIRST PRINCIPLE AND FIVE POINTS OF THE CONSTRUCTION OF THE SEWERAGE.

The *essential* FIRST PRINCIPLE of the sewerage was first pointedly suggested by my son, Mr. Marshall Hall. It consists in the *just* and adequate separation of the *Excreta* and

* Added August, 1856.

the *Water, in order that* the former may be preserved to our fields.

I have to propose then—

1. That the existing sewers, arising from ample *sinks* or funnels in each dwelling, be devoted *exclusively* to conveying the WATER, of which *eighty-one* millions of gallons now flow through London into the river daily;

2. That a *new* system of minor sewers be established originating in the *water-closets*, to be devoted to carrying the solid and liquid EXCRETA exclusively, of which *seven* millions and *a quarter* of cubic feet are now produced daily, into an ample CLOACA placed within each border of the river and below low-water mark;

3. That these *cloacæ* be of a capacity to receive the sewage produced during each *day*, together with an adequate quantity of water for the water-closets and for flushings; and to extend, *e.g.* from above Chelsea to below Limehouse;

4. That, at localities selected below Limehouse (the most dependent part of each cloaca), with or without intermediate *return-sewers* prolonged to more convenient places than those immediately on the river, the sewage be pumped, by engine-power, into CLOSE WAGGONS brought expressly along *off-sets* of the railroads to these points;

5. That the sewage be further conveyed along those railroads by a *night-service*, to begin after the departure of the evening mails daily, fresh and without loss or deterioration, to the distances of 50, 100, or 500 miles, into every agricultural district.

These five points may in reality be reduced to *three: excreta-sewers, ample cloacæ*, and *close railway-waggons*.

By these means—

1. The river and the atmosphere will be preserved from contamination;

2. The population from some dire diseases and a high rate of mortality during epidemics; and

3. The fields of England from exhaustion and sterility.

MARSHALL HALL, M.D., F.R.S.,
Of the Institute of France, &c. &c.

London, December 1, 1856.

NOTES.

Thousands of hundredweights of phosphates flow annually into the sea with the Thames, and with other of the British rivers.

Thousands of hundredweights of the same materials, arising from the sea, annually flow back again into that land in the form of guano.*

If a rich and cheap source of phosphate of lime and the alkaline phosphates were opened to England, there can be no question that THE IMPORTATION OF FOREIGN CORN MIGHT BE ALTOGETHER DISPENSED WITH after a short time!!

According to these premises, it cannot be disputed that the annual expense of Great Britain for the importation of bones and guano is EQUIVALENT TO A DUTY ON CORN.†

To restore the disturbed equilibrium of constitution to the soil—to fertilize her fields—England requires an enormous supply of animal excreta.‡

The author does not venture to enter into any details. But he may remark, that both the original cost of guano, and that of its transport to this country *and* to its *fields*, will be saved. A part of the sewage may be floated, in closed cloacæ or barges, up, and a still greater part down, the river, to supply the adjacent counties of Middlesex and Surrey, Essex and Kent, with manure. These and many other questions will require to be considered, if this *suggestion* should become a *project*. The plan must be generalized over the British Empire.

In Paris, perhaps a single cloaca may be sufficient. It may constitute one grand cesspool, instead of the many, and preserve the individual dwellings themselves from such nuisance. It may be emptied during each night into the close waggons now in use, and these may be taken and placed on trucks on the existing railways, and conveyed to any desirable distance.

The sewage-water alone may, as in London, be allowed to flow into the river. (See § 9, p. 185.)

The nuisance of the cesspools and of the *voiries* will be removed from the metropolis and its vicinity; the sewage-waggons may be employed to carry the manure wherever it may be required.

* "Chemistry in its Application to Agriculture and Physiology." By J. Liebig, M.D., &c. Ed. 3rd, 1847, p. 165.

† In 1849, it was 504,262*l.*; in 1850, 707,632*l.*; and already, on November 5th, 1851, it amounted to 1,175,272*l.*, for guano alone!

‡ "Familiar Letters on Chemistry." By J. von Liebig. Ed. 3rd, 1851. pp. 522—524.

The sewage-waggons may even be taken to the very fields themselves, both in England and elsewhere, not by the farmer, but by distinct sewage-officers, according to well-devised arrangements; a scheme, the value of which will be well understood by those who are acquainted with the intellectual inertia of some of our country people.

*** It is necessary to state that § 9, although introduced at p. 185, is a *postscript*. The writer has left § 8 and other paragraphs unaltered, in order that the value of the suggestion may be rendered the more apparent.

A little subsequently to the publication of the preceding suggestions, my father, in union with Sir Ranald Martin and other members of the medical profession, proposed to "establish an association to be termed 'The Society of State Medicine,' which should constitute a centre of scientific and practical information, in the metropolis, in everything that relates to public health, so as to be available for all purposes tending to the public welfare in sanitary affairs.

"The objects proposed by the Society of State Medicine comprise all that relates to the investigation of the external causes of diseases, and their prevention, including the most extended cultivation of the science of Medical Topography. Causes of disease which are now unknown must be keenly searched for, and those which are known must be further traced.

"It is also proposed to disseminate instruction amongst all classes of the community, on the most obvious and well ascertained causes of injury to public health, as neglect of proper drainage and sewerage, defective ventilation, and insufficient or impure supply of water, crowding of habitations, or of the inmates of houses, intra-mural interments," &c. &c.

CHAPTER X.

ANNUAL TOURS.

Every year, about the end of the London season, Dr. Marshall Hall made a tour on the Continent. Of course this was a loss to him in practice; but he valued health more than money. He preferred visiting foreign countries, as presenting more of change and novelty, and consequently affording more mental recreation, than remaining in England; he was thus compelled, as it were, to lay aside all the anxieties of practice; and the bow, sometimes too tightly strung, was unbent. Of the beneficial effects of travelling he entertained the highest opinion, which he thus expressed :—

There is no alterative or remedy of greater efficacy than travelling. The activity of body, the excitement of mind, the change of air, of soil, of scene, the freedom from harass and cares, the early hours, the various diet, the light wines even—all conduce to effect a change in the general system, its actions, its secretions, its various other functions. Moving about, we breathe more; we cease our hibernation; we live a life of a higher kind, being raised from that of the reptile with its slight breathing and cold blood, towards that of the lark and the eagle. The fire burning quicker, more food is required. The appetite and the digestion are augmented, and all the functions are improved; disorder subsides, and health and spirits return.

A tour of pleasure does not always fulfil its promise of enjoyment; under certain conditions, however, it may almost be predicted that it will not disappoint. These conditions I conceive to be—first, that the tourist shall have previously worked very hard—thus ensuring a zest for his holiday; secondly, that he should start with an abundant supply of good temper and cheerfulness; and, thirdly, that he should travel with his eyes open, and his mind ready to receive new ideas and impressions. In my husband's case, all these conditions were amply maintained. Let a man work as he worked—in practice, in lecturing, in laborious investigation, and in the publication of profound scientific views—and there is little doubt that his well-earned holiday will be keenly relished. That I and our son should accompany him was indispensable to his happiness, and *our* enjoyment greatly enhanced *his*.

The first of our little trips was in August, 1830, when we made a hasty tour through the Netherlands. It was during our stay at Antwerp that those events commenced which resulted in the separation of Belgium from the crown of Holland. Insurrection had already broken forth; we heard the firing in the Place de Meir; and, on proceeding to Brussels, we beheld the devastation committed by the mob; and an army, headed by the Prince of Orange, encamped around the park. The inhabitants were flying in every direction, the shops were shut, and orders posted up everywhere forbidding even the smallest group of persons to stand in the streets. It was at this time

that Lord Blantyre met his melancholy fate. The memorable siege of Antwerp ensued; and now all these events have become history.

In 1831 we visited Paris. Charles the Tenth's abdication had just been followed by the accession of Louis Philippe; the barricades had scarcely disappeared, or the capital recovered from the shock of revolution.

Our visits to Paris were repeated most years. Before the existence of railways, we usually crossed to Hâvre, and proceeded up the Seine by steamer—a passage much enjoyed by my husband. At Paris he sought out some of the physicians and *savans* whose works he had read with admiration. It was thus that his friendship with those highly distinguished men, M. Flourens and M. Louis, commenced—friendships which endured without interruption whilst life itself lasted. Here he became, as it were, again a pupil, daily accompanying M. Louis in his early clinical visits at the hospitals, admiring his acumen and careful diagnosis. "There are many stars in Paris, but Louis is the sun," he has been heard to say.

Our journeys were not, however, confined to the French capital; Germany and Switzerland were repeatedly visited, Italy and the Tyrol being also numbered among our excursions. The trammels of busy professional life being cast aside, how joyously did my husband step on board the steamer, his happiness communicating itself to all the party. On one occasion, in passing through Belgium, he wrote:—

The day is beautiful; the sky, the fields, ε ιtiful, and the corn is already in its yellow sheaves, anc ˌ ˌ destined, thanks to Sir Robert Peel, to feed the poor of England! Already I feel, spite of some fatigue, as if I had breathed more and digested better. Yes! the free exposure of the face and general surface to the breeze; the more frequent respirations excited by every muscular effort, the consequent quickened digestion, have already had their effect on my spirits and feelings. There is no "pathy" (to use the fashionable phrase), like Aëropathy—*vulgo*, air and exercise, and repose, and recreation of mind; with the advantage of its being without the charlatanism of one "pathy," and the weakness, folly, and superstition of the other.

In the steamer, the railway carriage, or the *salle-à-manger* he lost no opportunity of culling from every intelligent traveller with whom he became acquainted, the fruits of his observations in the field which it was the lot of that individual to cultivate, his intimate acquaintance with the French language enabling him to converse freely with the educated of all countries. His own cheerful temperament was the antipodes of what he describes in the following remarks, written in the *salle-à-manger* of the "Goldenen Stern" at Bonn, whilst we were taking our tea. After noticing a lively group of Prussians at supper, he adds:—

At the bottom of the table sat an English couple, not looking very happy, who, during the whole hour that we watched them, did not speak one word to each other or to any one. The lady especially had in her countenance a firm determination not to be social or comfortable. Which conduct and state of mind are the better for digestion I leave to your penetration to determine. In the general draught to be prepared for the benefit of travellers, we must have a sufficient

quantity of the syrup of good-humour and of the balm of contentment, and a permission to be pleased; otherwise, its other ingredients, however good, can be of no efficacy.

On board a Rhine steamer another party excited his pencilled remarks, though not his admiration :—

On the route we observed an English nabob, with a lady, probably his daughter. They never budged from their open carriage; and as the gentleman had put on a queer "*come ci pare*" sort of white hat, and as, by their position, they confronted the rest of the passengers and the stern of the vessel, they were sufficiently remarkable. It was a sort of backward way of travelling, in which they saw the scenery, not as they passed it, but as it had passed them. It was a sort of long *airing*, for of exercise there could be none. I should like to see a few statistic tables, displaying the degree of improvement in health and spirits, and of pleasure, experienced by such travellers as these. John Bull is very apt to be singular and to forego the advantages of sociability in his travels, especially that of which Bacon says—"Conversation makes the ready man;" or that which arises from the use of the vocal organs, of which our own classic—Celsus—speaking of the "*clara lectio*," says, &c.

A Russian lady on board smoked a cigarette. In conversation I mentioned our having seen Jérome Bonaparte, and his extraordinary resemblance to his brother Napoleon. She said, "I am a great admirer of Napoleon." I replied, "I admire him as I do a terrible storm of thunder and lightning." She seemed much satisfied with this.

Of all modes of land-travelling he preferred the "Lohnkutscher," or "Voiturier," as affording the opportunity of alternating pedestrian exercise with driving. He always first made a written agreement with the man, who, with his carriage and horses, was to be under our control, stopping when and where we

wished; and it was remarkable how generally he won the good graces of these men, by his good-natured, playful manner, and by the reasonableness of his requirements. Frequently, in mounting a hill, he would, in his light, active way, climb over the door of the open carriage and jump down, without stopping it, to pluck a flower, or walk up the hill; whilst the coachman, not aware of his exit, looking round, was often greatly astonished to find a portion of his "Herrschaft" missing! If the road happened to be monotonous, he occupied himself in writing, as we drove along—sometimes on the objects presenting themselves—sometimes on the Spinal System; for this subject was never completely laid aside. Another of his occupations was, impressing some scientific fact, suggested by the surrounding scenery, upon the minds of his companions. Numerous as were our visits to the Rhine, its scenery never failed to give him pleasure, nor did he tire of exploring its beautiful banks. Switzerland excited his enthusiastic admiration, while its Alpine phenomena suggested numerous scientific observations, which the limits of this volume allow me but sparingly to quote.

On the Lake of Lucerne he penned the following elucidation of the popular proverb—

Wann Pilatus trägt sein Hut,
Dann wird das Wetter gut!*

When the atmosphere is calm and still, the portion of air in the immediate vicinity of the snow-cold peak of Pilatus is

* When [Mount] Pilate wears his hat [of clouds], then becomes the weather good.

reduced in its temperature to below its dew-point, and deposits its moisture in the form of opaque vapour. Becoming specifically heavier, it slowly sinks down the slope, and is replaced by fresh portions of air above. Thus does this mountain become cloud-capped—thus "Pilatus trägt sein Hut." In order that this process may go on, the atmosphere must, as I have said, be calm and serene. If the wind rise, it is interrupted, and the cloud already formed is carried away; and thus the appearance of Pilatus' unclouded peak is a sign of stormy weather.

Schiller's "Wilhelm Tell" being in his hand, he commented on the following passage:—

> Mach hurtig, Jenni. Zieh die Naue ein.
> Der graue Thalvogt kommt, dumpf brüllt der Firn,
> *Der Mythenstein zieht seine Haube an,**
> Und kalt her bläst es aus dem Wetterloch;
> Der Sturm, ich mein', wird da seyn, eh' wir's denken.

This sign of the weather afforded by the Mythenstein appears, at first sight, at variance with that presented by Pilatus. But the process of the formation of the cloud, in this instance, is different. In the former, the air in contact with the peak of Pilatus was cooled and its moisture deposited. In the present instance this deposit arises from the admixture of different portions of air, of different degrees of temperature and of hygrometric moisture. This atmospheric phenomenon and process will require a little explanation.

Air from a warmer region blows over the peak of the Mythenstein—a craggy rock. In doing this, it carries with it the portion of air immediately beneath on the leeward side of the peak, and, mingling with it, induces a deposit of opaque vapour, or cloud.

The appearance of this cloud indicates the formation of a current of wind and the commencement of a storm.

That such is the action of a current playing over the peak

* The Mythenstein draws on his cap" is here noticed by the peas a sign of a coming storm.

of the Mythenstein is shown by a simple experiment. Let a piece of strong paper be bent at right angles, and, whilst a taper is burning near the middle of one of these planes, blow strongly with the breath, through a tube, along the other. The flame will be drawn towards the angle formed by the two planes. This is accomplished by the friction induced between the particles of air propelled from the tube and the contiguous particles of the atmosphere.

In the case of the Mythenstein, the air passing over its peak draws with it the air on the leeward side of this rock, and mingles with it: the consequence is, both being saturated with water, and of different temperatures, a deposit of opaque vapour or cloud, on the principles explained by the late Dr. Hutton. When on the Righi, in 1840, I frequently observed the appearance and disappearance of such clouds; they were *formed*, and again melted into thin air, into which they vanished.

On the Wengern Alp, so well-known to tourists, whilst gazing on the sublime Jungfrau, and listening to the thunder of the avalanches, he wrote—"The scene and its sounds are altogether enchanting, and one of the party observes—'What joyous days these are!'"

After visiting the Eismeer, whence the Lower Glacier of Grindelwald descends, besides many remarks on the structure and movement of glaciers, too long for quotation, he observes:—

The surrounding rocks, mountains, and summits are of the most interesting and sublime aspect—to say nothing of the edges of fearful precipices which we had to tread! Here we were in the very midst of rocks of ice, sometimes hanging over us (and these *must* one day fall)—sometimes yawning into fathomless crevasses, into which it was possible to fall,

whilst the way to and from this ice-world was one of giddy precipices.

Observing the effect of this excursion upon one of the party, he wrote :—

It is on occasions of effort and excitement of this kind, that caution is required, lest fatigue pass into fever, and a day of rest may prevent weeks of indisposition.

Arriving at Chamouni by the Col de Balme, on a splendid day, when the startling magnificence of Mont Blanc burst upon us in all its glory, from the summit of the Col, he concludes an account of the whole with, "*Never* can we forget this delightful day!"

After describing the view from our windows "of Mont Blanc, the pinnacle of Europe—glorious sight, which must be seen to be conceived," he speculates on the meteorology of these Alpine regions, saying :—

Clouds are formed, not attracted, by mountains—a question well worth investigating by experiment. In calm weather experiments may be made on the currents of air at the peak side,* under the influences of sunshine and nightfall.

The glaciers differ from other rivers in flowing *from their* sea.

In the following extract, parental anxiety is manifested, mingled with the desire to gratify :—

At this moment I behold the monarch of mountains in the splendour of the sunbeams, decked in vivid, spotless white, beneath its canopy of the brightest azure, affording the most beautiful and sublime scene in the world. . . . . On our way to the Montanvert, we heard many times the thunders of the disruption of the river of ice, and (after the rain) saw several avalanches of snow, of some magnitude (the thunderbolt). Beautiful in the bright light of the snow are all these objects;

* Speaking of the "Mole," a mountain near Geneva.

but most touching to *us* was the tracing of the steps of Marshall and his guide across the Mer de Glace, for they had ascended to the chapeau on the other side; at first, in crossing the black moraine, their progress was slow, often they stopped to observe, often retraced their steps to choose some safer and more practicable route. All this I discerned distinctly by means of my telescope—not without some feelings of fear and misgiving. At length they reached the whiter portion of the Mer de Glace, their difficulties were comparatively over, and they made rapid progress, and in a quarter of an hour arrived in safety. And *now* we could look around and admire the Charmoz, the Jorasses, &c. &c.

August 30.—Marshall is gone with his guide, having slept at the Montanvert, and we are to meet at the Cascade des Pélérins. I expect some proposition for the ascent of Mont Blanc, which his guide says he would be able to accomplish. If so, what shall I say? If *ever*, why not *now*? There would be the same danger at a future day, unless indeed the recent rains augment the danger of avalanches, as we saw yesterday. . . . . On their return from their tour over the glaciers (from the Montanvert to the Pélérins), Marshall's guide said that he would certainly accomplish the ascent of Mont Blanc, but that it would be an "imprudence" to attempt it until he was nineteen or twenty. He was not in the least fatigued, but much weather-burnt;* he was in excellent spirits and proceeded forthwith to cross the Glacier des Bossons. His excursions must have been very interesting. He had a guide to himself, and they concerted their plans together. . . . . We are now going to inspect the ruins of châlets left by the avalanche of February 15th, 1847. . . . . In the evening we saw the summit of Mont Blanc brightly illuminated by the rays of the setting sun, and, at the same moment, the stars; Chamouni

* Twice in one season (1849) my son lost the skin of his face, from exposure to the reflected glare of the sun from the snow. He then crossed the Strahleck, the Weiss Thor, the Monte Moro, and made many other excursions now familiar through the publications of the Alpine Club.—C. H.

itself, and the lower intervening mountains, being in darkness! This is one of the most extraordinary events I have witnessed; it was a glimpse of the Mont Blanc of the brightest hues.

On the way to Geneva he remarks:—"The whole of this route is beautiful, far more so than its slight fame would lead us to suspect."

During a previous tour he had written:—

Sept. 9th, 1846.—We are now on our way to Geneva. The first visit I will pay there shall be to the tomb of Sir Humphry Davy. I met him nearly thirty years ago at Mr. Poole's of Stowey. Both are now no more. Soon, in the course of nature, will the *third* be summoned! Only let him be found in Christ Jesus!

The pure love of science, and of scientific fame and glory, of Sir H. Davy was always an object of my admiration, and, at however great and humble a distance, of my imitation. I, like one of old, say "ed *io* sono pittore," whilst physiology, my favourite science, has for its object the mitigation of human suffering—an object scarcely less than divine; whilst to give medicine a scientific character, and to rescue it in some measure from the stigma of quackery, are objects worthy of the noblest ambition.

Geneva, Sept. 10th.—The landlord of "Les Bergues" knew nothing of the tomb of our great philosopher. No Englishman had inquired for it during the twelve years he had been here! So much for the fame of the successor of Sir Isaac Newton as President of the Royal Society, and the great promoter of science!

And here I write and copy the inscription. . . . .

The tomb itself is hemmed in by others, so near as to render it unapproachable, and it was with some difficulty that I could copy the inscription.

But why are the remains of one of our first philosophers allowed to remain expatriated, as it were, neglected and forgotten, when they ought to be placed in Westminster Abbey?

My next extract is of the following year:—

Geneva, Sept. 4th, 1847.—This day was rainy, but we walked over the town, admiring the *really* deep blue colour of the "arrowy Rhone," the beautiful lake, &c., and we visited the tomb of Sir H. Davy, which not a plant adorns. I, however, plucked a little branch of a shrub which from an adjacent grave spread over it.

Subsequently, in 1849, he wrote:—

Aug. 29th.—For the third time I visited the tomb of Davy. Immediately behind is that of the Rev. R. Brocken, M.A., and of Augustus Campbell, Esq., who both perished in a snow-storm on the Col de Bonhomme, on the 3rd of September, 1830, aged thirty and twenty. Near this is the tomb of Decandolle.

Soon after entering Switzerland we had passed the Ober-Hauenstein chain of mountains, which gave rise to the following enthusiastic expressions:—

The route between Langenbrück and Wiedlisbach surpasses all description or imagination: its castles, its rocks, Klusen, and the valley of Ballsthal, are of the most extraordinary beauty. We never can forget the Klusthal or the KLUSEN! If the day ever arrive when my toils cease, I would spend a week in exploring this beautiful scene! . . . . And having passed this, we catch a first view of the Alps of the Bernese chain—"hills o'er hills, and alps o'er alps arising." We come next to the fine ruin of Ober-Bipp. . . . . All this scenery should be described. Murray's account is meagre in the extreme.

At Berne we again saw Professor Valentin.

Quitting Switzerland by the Münster Thal, he wrote:—

It is nearly 10 a.m., the sun rising bright and warm and cloudless into the blue sky. How I delight to be with those dear to me, giving myself up to the contemplation of these

sweet and splendid scenes! Here to be with them, and here to meditate on Him who is my Saviour—to be, to live in Him—is to me the supreme good. In such a place would I accomplish my projected work, and await His coming! In our tour we have seen much of the mockery of religion. . . . Not so is Christ. His doctrine is pure, simple, *cordial, spiritual.* I believe His words, I do His will, I wait for, look for His coming. This is the Alpha and the Omega of the truth of Christ. . . . . Never was scene so majestic as that which I now behold, in the midst of the wondrous ravine leading from Moutiers! The rocks on each side of us—we pursue the course of the Birs—seem to reach to our very zenith! Such is their beautiful and sublime height. Pinnacle after pinnacle, each cleft from its neighbour by a deep and narrow ravine, and assuming every majestic form, succeed each other, opening occasionally into a green slope or an open and distant, though narrow valley. Nothing can exceed this Münster Thal.

Such is *the* most splendid scenery I have ever witnessed. In the midst of it I write these few words and gather this blue-bell—unnecessary memorials of what *cannot* be forgotten.

After some further details he adds:—

But there must be an end of attempts at description where every step we take is so admirable. . . . . This scenery appears beautiful even at the close of a tour in Switzerland; it is like the contrast in certain parts of music—the sweeter for the flat which divides it from the gorgeous scene we have left.

Travelling through the plain in which Strasburg is situated, he writes—"It is melancholy to see so many acres occupied in the production of pestilential tobacco which might produce food."

At the conclusion of one tour he writes:—

We had a stormy passage, and are, *D. gr.*, once more safely at our comfortable home. How thankful are we for such

safe return and for such a home! O Thou, who readest the heart, Thou knowest, how far passing this are that Home and Rest which are of Christ alone, here and for ever.

Dr. Marshall Hall's first visit to Italy was in the autumn of 1845. He had a longing desire to see the ancient classical remains of Rome and Athens, besides the deeply interesting environs of Naples. Railroads did not then exist in France, we therefore ascended the Rhine, crossed Switzerland, and entered Italy by the St. Gothard Pass, over which we posted, my husband carefully eschewing diligences and night travelling. The dazzling splendour of Milan's pure white marble cathedral, with its thousand pinnacles and statues, excited his great admiration, and he speaks of it as "the most beautiful work of modern art." He was full of delight at beholding, for the first time, the Mediterranean, in all its azure beauty, at Genoa, where, also, he wrote—"And now, the next time we sleep on shore will (D. V.) be at Rome! Strange and exciting idea!" On board the steamer to Leghorn he observes:—

I have been much struck with the appearance of a priest and of a frate (monk), fellow-passengers. The former pale, thin, and unshaven, looks an object of squalid wretchedness; he has his breviary constantly in his hand; while the monk, with a garment and hood of the very coarsest light yellow-brown cloth (the hood not matching with the rest), bare legs, and the most rude and pristine kind of clog and sandal on his feet, presents an appearance of the most abject poverty and wretchedness. If all this "voluntary humility" were really of Christ, and done according to *His* commandments and for *His* sake! . . . . I wonder how the splendid robes

of the cardinals and the sackcloth of the monks are reconciled with each other. . . . . To believe the words of Christ, and to do them, in all childlike simplicity, adding nothing, taking away nothing—this is the religion of Christ, and no other !

I now transcribe his reflections on reaching Pisa :—

We are now about to visit Pisa, the city of Galileo, and the scene of his scientific exploits ! It was here he first observed the equal oscillations of a lamp suspended from the ceiling of the cathedral ; it was here he performed his experiments on falling bodies, from the top of the Leaning Tower ; and, lastly, it was here he requested his persecutors to look through his telescope—in vain ! It was hence that he was summoned before the Inquisition—a glaring instance of intolerance in one party, and weakness and duplicity in the other ! In one breath he denied his doctrine of the motion of the earth, in another he said, "ma, pur si muove !" Alas ! the spirit of his enemies is not extinct in our day ! and his weakness might rather be viewed as well-founded terror. However this may be, Galileo is the object of my supreme admiration. How glorious must have been his first glimpse of those planets which, with their satellites, bear such a strong analogy to our own, and then first appeared so distinct from the stars !

Arrived at Rome, his delight was great in viewing all that relates to the Rome of former times, comparing ancient with modern maps, with his habitual exactitude. His interest was, however, more of a poetic than of a scholastic character, and arose, I believe, from his disposition to admire and revere whatever was great and noble of its kind.

On our route hither, while passing over the St. Gothard, he had made the following observation :—

We used our little telescope much in viewing the peaks,

snowy or otherwise, of this rugged scenery; might not such an instrument be contrived to give, by the *adaptation* of its focus, the *distance* of these objects?

At Rome, he writes:—

We drank tea with the Somervilles. I mentioned my idea of the telescope to Mrs. Somerville. She said she had not heard the suggestion before, and thought it probable. Mrs. Somerville thinks the clouds are attracted by the mountains. This may, and indeed must be. But their formation is not explained in this way, nor their absence on the lower hills, or even on the level surface. It is doubtless the *cold* of the upper regions of the mountains that causes the continual formation of cloud upon them. . . . . We have seen Rome. It has been a *coup d'œil;* but still we *have seen* its ancient monuments, grey in years, but of matchless beauty and intense interest; and we have seen its more modern structures, especially St. Peter's—of stupendous exterior and of resplendent interior.

Travelling on to Naples, by his favourite mode of conveyance—private vetturino—he was charmed with the whole route, especially Terracina and Mola di Gaeta. At Naples, in writing of Vesuvius, he observes,—

In the dusk of the evening we saw bright and sometimes brilliant flames of fire issue from the crater at rather long intervals. The smoke rose a little, perpendicularly, and then spread out in all directions. The cone was surrounded by two thin zones or rings of cloud—an effect unlike any inducible by attraction, and constituting two regions of clouds, as it were. How interesting would a long series of observations of this kind be! This morning I observed a similar ring around the mountain St. Angelo.

Having visited Herculaneum and Pompeii, we

ascended Vesuvius, when he made the following remarks :—

Vesuvius is the giant wonder of this region. The occasional explosive noise, flame, and masses of red-hot pumice, were sublime. In the midst of one of these, Marshall was near the crater with his guide, a shower of red-hot pumice falling around them! I could not but feel a momentary keen apprehension for his safety. The immense masses of lava, poured forth about a month ago, retain their form of rolling waves, and are warm on the surface and red-hot still, as seen through their fissures. We ate eggs roasted in this lava, and Marshall set his staff on fire.

The sudden bursts are most probably induced by water brought into contact with the incandescent lava; this principally expands violently into vapour, and partly suffers decomposition, becoming the source of flame. The effect induced by throwing water into a common fire, may give us a good idea of the phenomena: vapour, hydrogen gas (indicated by the smell), cinders, and ashes fill the room, accompanied by explosive noises.

Our intention had been to proceed by a French steamer from Naples to Athens; the following extract, however, explains the failure of this project:—

Our plans have been all frustrated by information from the clerk at the bureau of the French government steamer, that we should have to perform a quarantine of fourteen days on arriving at the Piræus from Syra. We went to the three consuls—for England, Austria, and France, and to the captain of the vessel, without being able to obtain *certain* information on that point! In this doubt, we determine to go to Ancona, and thence to Athens. This will detain us ten days longer from England, which I deeply regret; but I

believe I should far more lastingly regret the failure in seeing Athens, *the* object of our tour, which I consider a valuable part of my son's education. . . . . In the evening Dr. Martino called on me, and requested me to send my "Memoirs on the Nervous System," wishing to translate them into Italian.

In regard to the change of route, he wrote on the following day :—

Everything seems to oppose our visit to Athens. The road across that part of Italy—the Abruzzi—is bad and mountainous. There has been an *émeute*, and no horses are to be had. We therefore find it impossible to proceed to Ancona, and Athens is relinquished. We may visit it at some future day, adding Cairo to our route! But all this we leave to Him who hath determined the bounds of our habitations.

The idea attached by some, in Italy, to the name "Marshall Hall," was amusing. It was evident that it was supposed to denote some high rank. On one occasion, at Naples, when I appeared before the custom-house officers, they rose *en masse*, and the profusion of their obeisances quite astounded me, for I could not imagine to what I owed such extraordinary marks of deference. On board an Italian steamer, we were informed, with the utmost respect, that the best cabin had been reserved for the "Marchesa."

We retraced our way homewards by the wondrous pass of the Simplon. In crossing the canton of Berne my husband wrote—

We now enjoy the most splendid view of the Bernese Alps! This last, the parting view of this scenery is delicious, and left not without feelings of regret. How sweet would be a few

years of rest and quiet, the remnant of life, spent amidst these beautiful lakes, rivers, and mountains, far from care, far from the envious and malevolent of mankind, meditating on that day when Christ shall come and receive His own to Himself in everlasting glory, saying "Well done," &c., and, "Whosoever shall confess me before men, him will I confess also before my Father which is in heaven." . . . . Shall I ever visit this sweet spot again? He only knows with whom are the bounds of our habitations.

In some reflections written by the way, the following passage occurs in his note-book :—

The purity of a man's life and career affords no barrier against malevolence. I appeal to the history of the Christian martyrs themselves. Did they not say of Paul, "Away with him?" and of Christ Himself, "Crucify him, and deliver unto us Barabbas?" Man and the Truth remain the same.

On subsequent occasions the Danube, Bavaria, with its Salzkammergut, and the Tyrol, were explored. In 1852, for the seventh time, we re-visited Switzerland, proceeding by railway from Paris to Dijon, and thence posting, over the Jura, to Geneva. We had been many times at Chamouny, and had seen Mont Blanc from various points of view, both far and near. Still, we were prepared for something supremely beautiful in the view of it from the heights of the Jura, and were accordingly on the look-out when, the post-station at La Faucille being reached, and the weather being the clearest and brightest—*such* a view burst upon us as can never be described; it can only be *felt!* We beheld the monarch of mountains, enthroned in all his glory, presiding over a world of Alps, the intensely blue Lake of Geneva being spread

out at their base. Words were out of the question—we uttered a cry of ecstasy at what I verily believe to be, as my dear husband always called it—the most beautiful scene upon this earth. Such was his enthusiasm that, in order to afford an unimpeded view to each of the party, the carriage being a close one, he insisted on my mounting the driving-box, whilst he and our friend, Captain Strachey, sat upon the unguarded roof of the carriage—a somewhat precarious situation—thus leaving the interior entirely vacant. The passers-by looked up at our curious arrangement with no small astonishment, as we galloped down the pass, dashing round the sharp angles, with our four post-horses. To give some idea of the extreme delight which this wondrous scene afforded my husband, I must add that, on reaching Geneva, he seriously proposed that, on the morrow, we should retrace our steps and mount the Jura—a long day's journey—in order again to behold the view. In after years he often reverted to it, and talked of passing a whole week at the little post-house of La Faucille, that we might daily and hourly feast our eyes on that beauteous scene.

I have dwelt upon this incident, because it exhibits a marked trait in the character I endeavour to describe—that of intense admiration of the sublime.

High mountains are a feeling of the soul;

and this feeling is often associated with genius and warmth of heart. Dr. Arnold says—"The *poco-curante* temper is not the happiest, and that which

can admire heartily is much more akin to that which can love heartily." Sir Humphry Davy justly observes—"Great objects excite great thoughts."

In concluding this slight sketch of some bright and happy portions of my husband's life, I must observe, in regard to the quotations from his notes, that these spontaneous effusions of his heart and mind were written in pencil as we drove along, or at the tea-table; but I may add, as characteristic of his habitual exactitude, that the original copy is as correctly punctuated as if prepared for the press, not a comma being omitted, notwithstanding the circumstances of distraction under which he wrote. Want of space has compelled me to omit, besides a vast variety of other matter, many remarks on the inhabitants, the climate, and the vegetable products of the countries through which he passed. For the same reason I have not mentioned his visits to many distinguished professors at various places, where he was greeted with great cordiality. His later travels will be recorded in some of the following pages. Before dismissing the subject, I must add that he had an ardent desire to visit Palestine and Egypt —a desire which he did not live to realize.

During our travels there were instances in which my husband's courage, presence of mind, and rapid action, in moments of danger, averted impending accidents.

CHAPTER XI.

DOMESTIC CHARACTER.

GREAT natural endowments and industry leading to successful results, justly command our admiration; but, in contemplating the character of a distinguished man, we naturally desire to know what his every-day familiar life exhibited, what were his domestic habits, his feelings, and his tastes. Some also are curious to examine how far physical causes may have exerted an influence on the mind. Fontenelle says, that an Englishman in Paris was asked, in regard to Newton, whether he ate, drank, and slept like other people.

I have so frequently been interrogated as to the daily habits of my husband, that I am induced to enter into these details, at the risk of their being thought trivial by some. "Was he an early riser?" and a hundred other similar questions, have been put to me.

Although in youth, while pursuing his studies, Marshall Hall was a *very* early riser, he was not so in after life; indeed, he used jocosely to say, "early rising does not suit my constitution." He was not, however, idle in the early morning hours. About seven o'clock a cup of coffee was brought to him, after which he wrote or read for an hour or more before rising.

After a second cup of coffee and the slightest of breakfasts, he received patients at home from half-past nine till half-past twelve o'clock. He then took a luncheon of coffee, with abundance of milk and cream, eating some bread-and-butter only. During many years after our marriage he ate a meat luncheon, but afterwards returned to his former spare meal; latterly he left off even the bread-and-butter, and took nothing but coffee. About half-past twelve or one o'clock he commenced his round of visits to patients, and the interval between each was occupied by writing or reading in his carriage. His dinner generally consisted of roast mutton and a rice pudding, with bitter beer, and only one glass of port in the form of negus after dinner. Of this simple meal he partook with an almost invariable appetite, though very sparingly, for he was an extremely small eater. His culinary tastes were easily pleased; he usually found himself indisposed for mental exertion after partaking of dainties, and it was a principle with him not to be the slave of his appetite. Of course, the sedentary life which he led was unfavourable to digestion, rendering a careful dietary the more necessary; and doubtless this simple and light diet was very instrumental in enabling him to occupy his evenings in scientific investigations.

Sometimes a short nap succeeded to this moderate and wholesome repast, and he possessed the faculty attributed to Napoleon and Wellington, of falling asleep at convenient spare moments, and waking, when requisite, renovated and ready for fresh exertions. During

In making his fortnightly visits at Moorcroft, he used to indulge

the long period when he was pursuing his experiments, aided by Mr. Henry Smith, if the latter did not dine with us, which he frequently did, seven o'clock was the hour for his arrival. While the clock was yet striking, Mr. Smith's peculiar rap at the door was heard. Such was his punctuality, that if three minutes had passed beyond the hour, we used to say, "Mr. Smith is sure not to come now." After a short conversation on the topics of the day, they prepared for their evening's work, my husband's words, as I left the room, being, "Let us have tea soon." Accordingly cups of tea were speedily sent in to them, and the refreshing beverage doubtless sped the work.

During and after the experiments, he wrote a detailed account of them. I believe he never delayed this even till the next morning. Hence the extraordinary accuracy of his works. His usual hour for retiring to rest was about eleven or rather later. He generally slept well, but if not, he occupied himself in reading and writing in bed; for books, papers, and writing materials were always by his side night and day. At work intellectually through the whole day, he required a long night's repose. It was a very rare event for him to be called up to visit a patient; latterly he altogether declined going out at night, the servant having orders not to let him know when any one sent for him. He used to say, "There are plenty of young

in a nap immediately on entering the railway carriage, awaking just in time for the West Drayton station, where he left the train. I laughed at this convenient command over his somnolence, saying, "One day you will wake a little too late." And so it happened; on one occasion his nap extended to Slough!

physicians who would be only too glad to perform that duty;" and his health required that he should be exempt from it.

To the above category of daily work I must add, that during many winters he gave evening lectures on "The Practice of Medicine." During one session he delivered a course of lectures at two medical schools, distant from each other, as already related; so that the lectures themselves, and the drives to and from their locality, occupied between four and five hours, almost every day, for half a year.

In the foregoing pages is sketched the outline of a busy life. But it must not be imagined that all this professional occupation excluded domestic enjoyment. There were occasional days not entirely filled up in the manner I have described, and even on the busiest there were short intervals devoted to myself and our son; and sometimes we drove with him in order to enjoy more of his society. Notwithstanding the multiplicity of his engagements, he found time for a thousand winning modes of inculcating on his son the highest principles, and of imparting to him the most useful knowledge. Although his *mind* was in his professional and scientific studies, his *heart* was in his home—a home rendered always bright and happy by his genial disposition and good humour. Never did I know his temper affected by the most trying events and circumstances incidental to the practice of his profession; nor, worried, persecuted, calumniated, and unjustly treated as he was by a portion of the medical press, and by the envious and the

jealous, was he ever otherwise than amiable, kind, and considerate towards all around him.

These annoyances, provoking and unprovoked as they were, though they excited his indignation and were acutely felt by him, never made him irritable for one moment in the domestic circle, never clouded his countenance, nor rendered him moody or morose. I may confidently appeal to all who knew him intimately, for the truth of my assertions.

In another respect his patient temper was manifested. Interruptions, which are extremely annoying to some authors, did not ruffle him. He never denied himself to any one at any time; and I have often *marvelled* at the equanimity with which he bore the disturbance, in the midst of his writing, of an unexpected evening visitor, being thus deprived of some of his most valuable hours for composing his works. Without the slightest perturbation of temper, he would lay down his pen and put aside his important labours to listen to the prospects and direct the plans of others, perhaps of some student or medical brother. Towards all he was kind, cordial, and sympathizing, ready to communicate knowledge, and anxious in every way to be useful to others. He was a patient listener; how often have I sat by and wondered to hear him, simple as a child, asking questions of his visitor, frequently a youthful one, which he himself was best qualified to answer. One would have thought that *he* was the learner, so modest was he in listening, and in eliciting information from others.

My conviction of the great superiority of his judg-

ment and taste led me to consult him *on every occasion*, and such was my dependence upon these, that I scarcely ever selected a dress even without the benefit of his choice; and in all these small matters he gave me his attention with the greatest kindness and patience. Notwithstanding the vast amount of his labours, and the deep thought which they required, he always had time to spare for his friends, and never appeared hurried and overwhelmed.

I am often asked: "*When* did Dr. Marshall Hall find the *time* to write his works?" It does indeed seem an enigma, not easy of solution, that he should have been able to pursue such lengthened and laborious investigations, write numerous works, requiring deep thought and close reasoning—works which have been called the "Euclid of Medicine"—deliver many courses of lectures, and at the same time attend to a large practice and professional correspondence. Such a practice alone usually absorbs the whole of a physician's time; being, in itself, sufficient occupation for an ordinary man.

I will endeavour to show, for the benefit of the young student, by what means Marshall Hall was enabled to accomplish so vast an amount of labour.

His mind was generally occupied with important subjects, for he did not *think idly*.

He used scraps of time, which most people throw away, or bestow upon trivial objects. His works *were principally written in his carriage*, as he drove from one patient to another.

In recording experiments he noted them down *at*

the time. They were performed in the evening after a laborious day's practice, but he never retired to rest till he had accurately written the results. His own words are, "I went from experiment to my writing." Hence the correctness of his details.

When possible, he wrote down an idea at the first moment of its occurring to him, lest it should escape him altogether. This habit he was wont to inculcate on young persons.

Extreme *exactitude* in everything was one of his characteristics, his well-known punctuality resulting from this quality of his mind.

He had a remarkable power of abstraction and concentration of mind, and a distinct arrangement of his ideas. When about to write a work, he often said, in answer to my question whether he had begun it, "No; but I have it all clear in my head, and it will soon be written when I commence it." Sometimes he would draw out an elaborate arrangement of a projected work, writing it in chalk on a large, black, framed canvas, which stood in his room. It was my office to copy this on paper.

Such was his power of concentration, that trifles did not disturb him; consequently it was not his habit to seclude himself, even when composing his most profound works. Conversation did not interrupt him, provided he was not required to take part in it. He loved the domestic circle, and even when his mother and others of the family were with me, he would bring his writing into the drawing-room, where we were all assembled in the evening; and if he thought that, from

the fear of interrupting him, there was any restraint put upon the conversation, he would look up from his papers, and say, with a pleasant smile, "Go on talking." He used to say that he wrote the best when there was music in the room.

The mental process by which correct conclusions are arrived at was, in him, unusually quick. I have often been struck with the facility with which he seized the chief points in some bewildering, entangled subject, of whatever nature. Where the minds of most would be perplexed in a hopeless labyrinth, he saw his way through the difficulties, and reduced all to order.

He wrote very rapidly, both as regards the composition and the manual operation; and though his pen appeared to fly over the paper, his ideas flowed faster than they could be written down.

Although in composing his works he sent the first rough copy, just written with pencil in the carriage, to the printer, it was marvellous how little alteration was required in the proofs, the errors resulting chiefly from the occasional illegibility of the manuscript. In looking over his proofs I sometimes remarked—"This word occurs too frequently in the paragraph; could you not substitute another for it?" On consideration, his reply often was—"No; it expresses my meaning better than any other word; I therefore prefer to retain it;" thus sacrificing elegance to accuracy and force of expression. Indeed, he used to say, "I do not pretend to *style*." Nevertheless, I believe all agree that his writings are remarkable for

dignity, vigour, lucidity, and simplicity. Such was their characteristic terseness, that I remember an author, who wished to give an abridged account of his views, for some compilation, found the task impracticable; the sense was already expressed in the fewest possible words, not one of which could be spared. So condensed are some of his writings as frequently to be aphoristic; and he often compressed his subject into a tabulated form, of which he has left many remarkable examples.

He wrote French so correctly, that a high authority, Monsieur Louis, said, in speaking of the "Aperçu du Système Spinal:"—"De ce petit ouvrage tout plait au premier abord, la forme et le fond. Quelle clarté, en effet, quelle rapidité dans l'exposition des faits! Quelle sobriété de langage! Vous êtes un écrivain consommé, même en Français; et la seconde lecture me charmera encore plus que la première."* M. Louis, who corresponded with my husband during upwards of twenty years—a correspondence and a friendship which terminated only with the death of the latter—has sometimes expressed himself in terms of extreme admiration of the pointed and feeling style which marked his letters. He wrote numerous papers in French for the "Comptes Rendus" of the Institute, and all with ease and correctness.

He was rapid in everything he did; his step was quick and light. I have often known him return from the evening meeting of a medical society, bringing with him some young friend or student breathless and

* xtract from a letter dated Nov. 21st, 1855.

heated with the extraordinary rapidity of my husband's pace. In one thing only was he slow, and that was reading. Probably this might arise from the habit of reading books which required close attention, for he was careful never to take up any idea erroneously, or even imperfectly.

His writing was so rapid as to be frequently somewhat illegible, and, aware of this, he used to give it me to "make it plain." As this was not always possible, I often made a fresh copy. In writing to foreigners, especially, fearing they would not read his hand, I generally copied his letters, and sometimes he begged me to sign his name. Often have I jokingly said—"My writing will be handed down to posterity as your autograph!" Frequently, during his afternoon round of visits, he would call at home and bring in a whole portfolio of letters, which he had written in the carriage, to be addressed, and sometimes copied by me for the next post.

In 1837, when his lectures were about to be published in the *Lancet*, the printer of that journal, on receiving my husband's own manuscript copy of his first lecture, wrote to the editor, saying he could not undertake to print from such illegible copy. The letter was transmitted to my husband. What was to be done? I offered my services and copied from the pencil manuscript (written in the carriage) nearly the whole course for the *Lancet*, and proud and happy was his amanuensis to aid him in the humblest manner. As he lectured entirely without notes, the lectures were written subsequently to their delivery.

When he was not engaged in experiments, we always spent the evenings together.

I studied to relieve him as much as possible from the small concerns of life, in order to leave him free for the exercise of his great mind. To me he delegated all money-matters, payments, &c., saying—"It is enough for me to *gain* the money; I cannot undertake the trouble of *spending* it." Such was his generous and unbounded confidence in me, that all he possessed was made our joint property, and a striking instance of his confiding nature is afforded by the circumstance that he never once wished to look at my accounts, or asked me any questions relative to them, further than saying, "I hope you do not owe a bill." He had a horror of incurring debts, and could not endure to owe anything. Generous to the poor, simple in his requirements, frugal in his own personal expenses, and detesting all ostentation, he had no love of money. So little indeed did pecuniary matters occupy his mind, that he frequently forgot the amount of our property, and asked me, "How much have we? Write it in my memorandum-book."

He never would enter into any speculation. In the early part of our married life, from a desire to assist others, we lost large sums, our confidence being abused by unprincipled persons. We were also misled as to investments; this had the effect of making us thenceforth constant to the English funds, "The amiable Three per Cents," as Sydney Smith called them.

My husband did not enjoy anything unless I and

"the boy" partook of his pleasure. On the other hand, if we were his companions, all was happiness. Simple in his pleasures, he loved to rusticate for a few hours, when his busy life admitted of it, gathering wild flowers, watching the inhabitants of some pool, or perhaps swinging on a gate with his little boy. His acute observation and his love of nature found abundance of interest and amusement in simple objects in which a dull mind would discover only dulness.

One of his pleasant recreations was to drive to Dulwich and spend a few hours with Dr. G. Webster, whose name, as the true and affectionate friend of thirty years, stands first on the dedication page of his last work. The unvarying hospitality and warmth which welcomed us, the pleasant chat, and, in fine weather, the game at bowls on the lawn with the young people—the two sage doctors being the most animated of the party—can never be forgotten. To this excellent friend, in whom he had the most unbounded confidence, my husband imparted all his discoveries, and the various troubles and vexations which, whilst envy and jealousy exist, must ever wait upon distinction; his counsel was sought, and we drove home with lighter hearts. Most ungrateful should I be, did I not acknowledge the pleasure, and often the relief, which these visits afforded my dear husband.

He was fond of children, and such was his delight

Some one told a friend that, in passing along a country lane near hgate, he saw Dr. Marshall Hall swinging on a gate with his little
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in giving them pleasure, that he would put himself to trouble and inconvenience to effect this object. He never failed to gain their confidence and love. I have often thought that it was his strikingly benevolent expression of countenance which attracted them. The young instinctively find out a warm, genial disposition; and seldom did they leave his society without having gained some useful idea from him, for he possessed a peculiar power of adapting his instruction to all ages. His was that art, of which Madame de Staël speaks: "Se mettre en arrière de ses propres connaissances." He had a talent for simplifying and rendering familiar the most profound truths in science, and loved to show some little experiment in chemistry or natural philosophy, ingeniously adapting the commonest household articles for his purposes.

Before our marriage, he often said to me, "When I have a happy home, I shall do more than I have ever yet done"—a prediction which I think was verified. After that event we agreed that we would not "visit," in the ordinary acceptation of the word, and we adhered to our resolution. General invitations were declined, and not reciprocated, which of course soon narrowed our circle of acquaintance, though it by no means precluded much delightful society among friends who, like ourselves, enjoyed quiet, intellectual, unceremonious intercourse. Some of our friends thought this exclusive life very unadvisable. One, my husband's senior, gravely represented to him that it would be a serious disadvantage, in preventing the extension of his practice, and counselled the cultivation

of a large circle of acquaintance, as a politic measure. His advice was not followed, which we never had reason to regret.

A physician in large practice is obliged to live all day, as it were, in society. He is brought into contact with all classes and grades of the community, with all sorts and varieties of mind, character, and manners. What wonder, then, if quiet and domesticity be congenial to him when the toil of the day is over? Besides, as I have already described, my husband's evenings were most usefully occupied, and he grudged the loss of one. There was another reason why he avoided dinner parties: the sad malady which affected his throat as early as 1839, often interfered with deglutition, which was, of course, distressing to him in society. No one, however, delighted more in social, friendly intercourse, and none could exercise more warm-hearted and genuine hospitality. His house and his table were ever open to his friends, who were entertained without ceremony. In this friendly manner we received, not only our English friends, but also a great number of foreign guests, distinguished in science, for such usually sought out my husband in their visits to England, his works having spread his fame abroad. I have reason to believe that these friendly receptions were appreciated, his facility in speaking French being, of course, an advantage on such occasions

The variety and playfulness of his conversation had a great charm for others besides the cultivators of science. "J'aime Madame Hall, mais, pour *Monsieur* Hall, je *l'adore!*" were the words of the late Princess Sophie Wolkonsky, addressed to Madame Louis. This

So far was he from the slightest love of anything like ostentation, that he was in the habit of asking persons to dine with us without any preparation, or any alteration in our usual meal. As an instance, I may mention that a German physician, a perfect stranger to him, but introduced by the late Baron (then Chevalier) Bunsen, happening to call just before dinner on the very day that we changed our residence from

amiable Russian princess, when in London, was among those who improvised evening visits to us, or joined us at our family dinner. In 1852 she left England for the celebration of her "golden wedding," that is, the *fiftieth* anniversary of her marriage, which, in Russia, is observed with great festivity. Unhappily, however, the serious illness of her husband, the Prince Wolkonsky, subsequently terminating in his death, precluded the intended rejoicings. The extreme simplicity of the manners and habits of this lady, although in Russia she ranked next to the imperial family, was remarkable.

I have preserved numerous gratifying letters to my husband from various foreign guests, which prove how warmly they felt his friendly reception. From one of these I venture to make the following little extract, which will, I think, please the reader. The name of the writer stands high in science:—

"I feel a great satisfaction in assuring you that the personal acquaintance of you and Mrs. Hall was the most eminent of so many pleasures I had in this last journey. I hope the consequence of that will continue during our life. If possible, I beg you for that enjoy us by your visit next summer! Several days at —— are not too long a time for dedicating to us. The beautiful environs of —— will be, I hope, a point of attraction for Mrs. Hall. Our science also shall not be entirely neglected. Great many frogs are always present, and several little green frogs, who show the weather, are in attendance for you. Enjoy me very soon by a letter, ascertaining me you are in good health."

The common frog had been highly instrumental in solving the problem of the Spinal System; whilst the green "tree frog" of Germany was an object of great interest to my husband, from its peculiar habits. The amiable and accomplished wife of this gentleman added an affectionate postscript to myself.

Another German correspondent writes:—"As Dr. —— relates me the great hospitality which he enjoyed by you, as more I am desirous to make possible my vogage to London."

14, Manchester Square, to 38, Grosvenor Street, my husband insisted on detaining him for the first dinner in our new abode, whither we all walked together. The furniture was but partially removed, and the household arrangements were in an incomplete state. But there were a few chairs and a table, and our guest partook with us of a joint, &c., the plain dinner being seasoned with that thoroughly warm-hearted friendliness which so characterized my husband. Our German visitor was deeply impressed with it, as we afterwards learnt from a friend, and I question whether the most elaborate entertainment would have afforded him equal pleasure.

At the time when Dr. Hall was lecturing to a large class, he frequently invited his pupils to *conversazioni*, on which occcasions he laid before them many interesting objects.

This I can most truly aver—he *never*, on any occasion, or under any circumstances, received a visitor, of whatever rank, with coldness or discourtesy.

If a country friend were out of health, he would say, "Come and stay with us, and I will see what I can do for you." Genuine benevolence actuated him in everything. The consideration with him was not, "What can they do for me?" but, "What can I do for them?"

The following letter from Dr. Noble of Manchester, depicts very truthfully some traits of my husband's character to which I have already alluded :—

I well remember the circumstances of my first personal introduction to Dr. Marshall Hall.

It was in June, 1847, that, being in London for nearly a fortnight, I procured a letter from our common friend, Dr. Lee, and called with it in Manchester Square. I was greatly delighted and surprised indeed with the exceeding kindness and courtesy shown. He playfully chid me for deeming a letter of introduction necessary, pleasantly observing that, after our correspondence on several occasions, we were well acquainted, and that, had he been in Manchester, he should, in calling upon me, have brought no letter, and so on. I accompanied him, after luncheon, in a round of visits, and he kindly asked me to dine the following day.

I accepted this invitation, and then first had the pleasure of meeting yourself; a Mr. Smith, a surgeon, was also there. After dinner we had a most delightful evening; knowing that I was greatly interested in all that concerned the nervous system, and especially in his own particular doctrines of the spinal cord, he had procured frogs, upon which experiment upon experiment was made, with a view to show, not only the physiology of the cord, but certain of its pathological susceptibilities. His kindness and his patience I never shall forget.

I saw him on several other occasions, both during that visit to London and one made in 1849; on which latter occasion, also, I was the recipient of his hospitality and kind attention.

I remember, after my visit in 1847, I was attacked with typhus fever immediately on getting home. During my convalescence I wrote to Dr. Hall, and of course mentioned the circumstance. The interest he took was remarkable; I had several notes from him, asking what progress I was making in the recovery of strength.

Indeed, all my recollections of this distinguished man are "sunny memories;" and they dwell in my mind not only as grateful reminiscences, but as the subject of an honourable pride, in having established something like a friendship with so great and so good a man.

The pleasure which my husband had in conversing with scientific men was great, and it appeared to be

reciprocated. The following passage occurs in the "Life of Dr. J. Reid," of whom it is said:—

He enjoyed one evening very much when Dr. Marshall Hall and Dr. Tyler Smith joined the family party. His admiration for the genius of Dr. Hall was unbounded.*

He was at all times extremely desirous that both friends and opponents should witness his experiments, this being the fairest mode of judging of them.

Mr. G. A. Keyworth has aptly delineated some characteristics in the reminiscences which I here quote:—

There was in Dr. Marshall Hall a peculiar softness and gentleness of tone and manner very impressive to a stranger.

His language, though always fitted to sustain severe criticism, had no trace of pedantry or effort. His remarks had a weight and decision peculiar to himself, apart from their originality, which speedily showed his to be a mind of no common order, and then every one must have noticed the incessant activity of his brain, the results of which have been so large; an activity which had a value immensely greater than that of ordinary minds, because of its perpetually working out of the beaten track, making new paths for itself—a true intellectual pioneer.

He had great power of concentration. You felt this in his conversation and in all his correspondence; and beaming from his countenance, and appearing continually in all that he did, was that kindness which so endeared him to a wide circle, attracting strangers and persons of all ranks.

His conversation was free from anything satirical or ill-natured, and every one felt at ease with him and able to speak without any reserve.

All these qualities gave him great influence; it was difficult, indeed, to resist the conviction that his views, when he chose to urge them, must be the only true ones.

* "Life of Dr. J. Reid," by G. Wilson, M.D., p. 257.

His genius led him to grasp principles as well as to examine details. He loved to illustrate by simple and ready experiments.

He worked and thought profoundly in science because he could not help doing so.

The mere externals of fortune or position were nothing to him. He delighted to assist by his advice an humble inquirer in philosophy, and the animation of his manner, and his unfaltering, wonderful patience, were doubtless felt to be contagious.

His rare simplicity of character, an attribute of the highest genius, deserves to be particularly noticed. This happy quality gave him the affection of inferiors, and of many who were incapable of appreciating his researches. He could discern points that pleased him, without being prejudiced by deficiencies in fortune or station. It may well be questioned whether he ever, during his whole life, endeavoured to form a friendship merely with a view to social advantage; and, certainly, having formed one inferior in the matter of position, he would not have been ashamed to own and acknowledge it before all the world.

The following graphic recollections are from the pen of my friend, Mrs. C——, who had great opportunities for observing what she so well relates:—

No matter when or at what time I saw Dr. Marshall Hall, he was always in the same charming mood; his countenance beaming with benevolence, and shedding happiness around him. His was a nature intensely good and kind. I never beheld genius so unspoiled by the world. He seemed, indeed, to live in a world of his own, interrupted by no cloud. Study was his delight. I have gone to his house at various hours, and found him ever with pen or pencil in his hand, writing rapidly, never interrupted by the entrance of friends or visitors, but rising quickly from his chair, with a shake of the hand and a greeting warm as sunshine itself, he returned as quickly again to his occupation; another bright smile from his good

earnest eyes, as he turned to his wife and visitor, saying, "Go on, Charlotte, you don't interrupt me!" and away went the pen as rapidly as ever. I fancy I see him before me now, in the simplicity of his noble soul, his great, good heart. He was truly a man who lived but to do good, and to communicate the results of his mental gifts and researches to others. The extent of these *we* may not live to see; but *he* will be blest in the memories of thousands for his untiring patience in the noble work which ended not even in his last illness; for when cold death had already clasped his one hand, with the other he still grasped his beloved science, writing on with the same fervent zeal and earnestness. I may in truth say that he always appeared to me *earnestness personified*. Whether it were in the elucidation of some hitherto undiscovered diagnosis in disease, or in explanation of some poetical fable for a child, it was equally a matter of earnest interest to him, who was above all in mind and one with all in sympathy. He had great delight in music; I have seen him listen with untiring pleasure to any touching melody, especially vocal; anything in verse or melody, which went direct to his heart, was sure to gain applause from him. He was of a most affectionate nature, a most disinterested being. A high motive evidently influenced all his actions; not that of gain or reward, which always seemed far from his thoughts and views. Riches followed him *unsought*. When he was too ill to advise the rich who came to him, he found a voice to counsel the poor. These are undoubted facts. Nor would he disappoint the hopes of a child.

With extraordinary quickness of perception he studied the feelings of those who came within his sphere.

Unselfish in a high degree, whatever he did or bestowed was done nobly and liberally. Seldom do we behold one created in the image of God reflect back that image so sweetly, so gratefully. I am never tired of expatiating upon his many exquisite qualities of mind and heart. What a pattern he was for all to imitate. I fancy no one observed him so minutely as I did! Ever a worshipper of genius, in him I beheld even more

than that—a union of qualities most remarkable, which in me has left a lasting reverence and affection.

His labours in scientific investigations, his indefatigable industry in writing, instead of rendering him morose or gloomy, seemed rather to shed a halo of sunny joy around his path, into which happy region he drew all around him and within his reach.

How like a philosopher did he arrange his mode of life! He enjoyed its most simple pleasures, and whilst I write this a thousand pleasant recollections flit through my mind of his charming scientific evenings, when he, the centre and the star, would turn round from his microscopic investigations, and, with his ever-cheerful smile, address his youthful visitors, discussing the merits of a song or a poem with an equally earnest pleasure. His was the soul to shed light and encouragement upon every human effort. He made it difficult to believe that *he* was the great man. A child amongst children, *self* never obtruded, but seemed wonderfully obliterated in his intercourse with those around him.—R. E. C.

Marshall Hall was eminently of a *happy* disposition. All who knew him well were much impressed with this feature of his character.

In a letter from Dr. Davy, the brother and able biographer of Sir Humphry Davy, the following observation occurs, in addition to some valuable information which I have inserted in an earlier portion of this volume.

I will not conclude without adverting to my later recollections of your dear husband, such as were acquired when I occasionally visited town and experienced his hospitality. These too were all of a favourable kind—he seemed so happy in his successful researches, so cheerful and buoyant, with a partner who appreciated him, and a son of whom he was proud.

How well and how truly is it said by a charming writer—"The fervent spirit is always a healthy and happy spirit; working cheerfully itself, and stimulating others to work."*

The following remarks are from the pen of Mr. J. North White, who saw him in the intimacy of private life :—

I cannot but think that our dear friend Dr. Hall was a very happy man. It must have been a happiness to possess such an active and gifted mind, combined with such activity of body. Was it not evidenced in that charming playful manner in which he endeavoured to excite his friends to exercise their reasoning faculties?

Yet another reminiscence from Mrs. W. :—

Dr. Marshall Hall gave me the idea of as happy a man as it was possible to be. His mind was always occupied actively with important subjects, and this imparted to him a lively cheerfulness. Nay, sometimes there was a freshness about him which was almost boyish! There was a warm enthusiasm of manner, literally an *enjoyment* in the subjects that preoccupied him, which could not but impart itself to those who came in his way. Sometimes, when I have entered your house, the Doctor has accosted me with, "Oh, Mrs. W., I have something *so beautiful* to show you; come and see!" And then he would *fly* up stairs, at a pace with which no one could keep up, from the bottom of the house to the top, to show me some natural curiosity which had delighted him. Whenever in the Doctor's society, I always learnt something which was valuable and worth knowing.

My reader may recollect, in an earlier portion of this volume, a similar remark made by Mrs. Fletcher even when he was a student at Edinburgh.

* "Self-Help," by S. Smiles, Esq., p. 323, 20th edit.

The late amiable Dr. Roupell concluded a note to him, asking for his autograph, with these words:—

I have never had the pleasure of any communication with you without deriving knowledge, information, and (I may add without flattery) delight.

His conversation, like his life and example, was ennobling, purifying, and inciting in the highest degree. Overflowing with intelligence, it was also remarkably suggestive, and his frank, simple, kind manner encouraged all who approached him. My friend Miss P. says,—

Although I had the highest respect, nay almost veneration, for Dr. Hall, I never felt afraid of him. Those only who were guilty of any moral delinquency would have had cause to fear him.

He was always accessible. I could tell him all I felt, and if I did not express myself accurately, in the kindest, most gentle way, he would correct me.

He avoided mere gossip, and was particularly careful not to repeat any story which might have been communicated to him to the disadvantage of others. Indeed his good nature, as well as his experience of the world, led him to disbelieve idle, censorious tales.

He took a lively interest in the investigations and discoveries of others, and liked to converse with men who excelled in their respective pursuits, whatever these might be; and when in the company of such persons, he directed his conversation to their peculiar subjects, anxious to elicit knowledge from them. In fact, he admired whatever was good and great.

Although he had concentrated the whole force of his mind upon the study of his profession, it was impossible to present to his notice any intellectual subject without exciting his interest; and it was evident that those mental powers which led to distinction in his own profession, would equally have ensured eminence in any other career, originality and comprehensiveness characterizing his views on all subjects. As an instance of his political largeness of view, I may refer to his plan for the gradual emancipation of the slaves in the United States, whilst his pamphlet on the "Sewerage of London and Works on the Thames," illustrates the same fact in regard to national economy.

The society of literary persons was delightful to him when they were communicative and agreeable. His tastes would have led him to cultivate literature; but it can readily be conceived that he had little time for indulgence in discursive reading. Astronomy had great charms for him: Mr. J. R. Hind, so highly distinguished in this noble science, was his friend and fellow-townsman, and, as well as himself, had the honour of being elected into the Institute of France. Whenever my husband could find time on a starry night to visit the Observatory of Mr. Bishop, in the Regent's Park, which is under the able superintendence of Mr. Hind, it was to him a treat of the highest order, and he often longed for leisure to devote to a study to him so fascinating.*

* Mr. Hind dedicated one of his works on astronomy to Dr. Hall, in very gratifying terms.

He had a high appreciation of the classics, and sometimes formed plans of study in them, which, however, want of time prevented his carrying into execution.

The general refinement of his character imparted taste to all that he wrote and all that he did. Many of his ideas and expressions were essentially poetical and graceful.

He was a warm admirer of the higher class of poetry, Shakspeare being his chief favourite.

It was not till middle age that he began the study of German. While engaged in his physiological researches, it was intimated to him that several German physiologists, and especially the late distinguished Professor Müller, of Berlin, continually mentioned him in their works. This became, at length, so frequent an occurrence, that he resolved to enable himself to read these passages in the original. With this object he commenced the study of German about the age of forty-seven. I joined him in it, and we soon became much interested in that remarkable language; the time which he could devote to it was so little, that he never attained great proficiency, but very rapidly acquired a sufficient knowledge to serve his purpose; and I have often been astonished at the quickness with which he seized the meaning of an abstruse author, notwithstanding his limited acquaintance with the language.

At various periods of his life he devoted some attention to the Hebrew, in order to read the Holy Scriptures in the original. I shall have occasion subsequently

to mention the untiring energy with which he pursued the study of this language, under the tuition of a Rabbi, at Rome, when sixty-five years of age. Of all his studies, not even excepting physiology, that of the Scriptures was chief and foremost.

His friendships were not only warm, but enduring; and they were evinced, not by mere words, but by untiring deeds of active kindness and important service. The trouble which he would take to serve a friend knew no limits, and his energy and promptitude of character were remarkably evinced in this respect. Was a letter to be written in the service of a friend, not a post must be lost, not a stone left unturned to accomplish the object.

His benevolent disposition led him to assist friends in many ways little suspected by the world.

As one among numerous instances, I may mention that his zeal in serving a friend who had no claim whatever upon him, induced him, notwithstanding his repugnance to early rising, to receive two gentlemen for breakfast at seven o'clock every morning during three whole months in the winter, in order to superintend the writing and publication of a work for the friend alluded to, who was himself unequal to the task. I regret to say that the fatigue consequent on this instance of disinterested friendship injured his health.

Young members of the profession frequently came to ask counsel, as to their future career, of one who had himself been so eminently successful. He uniformly received them with kindness, and entered fully

into their position, giving them his deliberate and best advice, and encouraging them to zeal and diligence. They were invited to repeat their visits, and I may truly add that they were not sent empty away, for he never failed to communicate freely out of the stores of his knowledge. Frequently he would impart to some young visitor one of those original ideas with which his mind appeared to teem; and I have often heard him say, "I make you a present of this idea; there is a fortune in it if pursued with energy." Constantly inculcating diligence in scientific pursuits, he was wont to say, "Take up a subject and pursue it well, and you cannot fail to succeed." Many can trace their success to his suggestions and untiring assistance, without which some valuable works, leading to success, would never have been attempted. That his kindness was appreciated by many, I well know; and as an instance of this, I cannot forbear quoting here the grateful expressions of one in whose welfare he took a warm interest:—

> I find myself indebted to you beyond all acknowledgment for much instruction and much personal kindness, and I shall always cherish the remembrance of it very warmly. If I do not succeed in my profession, it will not be for want of assistance and kind encouragement from one who has himself gained all the honours of the scientific world.

His sympathies were not, however, confined to his own profession, his kindly feelings being denied to none. In the social circle he devoted a peculiar attention to any individual who was suffering, either mentally or corporeally, his manner being gentle and soothing. It

seemed, indeed, as if the sorrows of another became his own. Sure of meeting with sympathy from him, how often has the full heart poured its griefs into his ear, ever open to the distressed, and before quitting him has been relieved of half its intolerable burden, soothed by his kindness and fortified by his counsels. The pleasant music of gratitude has reached my ear many a time, and I retain the record of many a warm acknowledgment of his kindness. But to all who know mankind, it is a truism to say, that unfortunately there exists a lamentable amount of ingratitude in the world. My dear husband experienced a *bitter* and *full* share of this, yet it did not prevent the continuance of his benevolence, *even to the last day of his existence.* Surely it was remarkable that so busy a man should always have had time to perform acts of kindness for all around him. Who can forget his friendly words, so often uttered at parting—"Is there anything I can do for you? Let me know if I can be of any use to you. Let us soon see you again." Many, many, I well know, miss those friendly words. For who among us, whatever his station or possessions, has not felt the want of a friend on whose judgment and disinterested advice he could safely rely, and on whose sympathy he could always count? How rare are such friends!

He was liberal in affording pecuniary relief; indeed, the amount of his private generosity will never be known. I have lately seen a former patient of his whose expressions on the subject of his kind physician struck me so much, that I requested him to write, as

briefly as possible, what he had verbally related to me. I here subjoin his letter :—

London, Jan. 12th, 1859.

Dear Madam—When I promised to express on paper my opinion and experience of your late lamented husband, and my truly kind friend, I little thought of the difficult task your request would impose on me, in consequence of your requiring conciseness. On looking back, or rather over, the constant kindness of twenty-nine years, I feel I could much more easily cover a quire of paper with their account than confine the expression of my feelings to a single sheet.

In the early part of 1828 I first had the happiness of making Dr. Hall's acquaintance. I had then just come to London to seek employment. He at once took a strong interest in my prospects of success, and very seldom did I see him without getting an order. These were mostly for small fancy engravings, the cost of which was from 3*s.* 6*d.* to 10*s.* 6*d.*, but in every case a sovereign was paid, with the promise that I should do the next for the balance. Need I say that I never could get him to remember such an agreement, and the sovereign came as usual.

In 1829 I first had occasion for his professional assistance, and then it was that I became fully aware of the unspeakable value of his friendship. For weeks he attended many times thrice in the day, and a fee he never took from me ; so that, if a continuation of such friendship from 1829 to the hour of his lamented death could awaken a feeling of gratitude, I had just cause to feel it in its fullest sense ; and I am happy in being able to say that I never, on any occasion, had the least cause to think there was any tiring or alteration in his feelings towards me, as the same kindly smile and shake of the hand always met me when I called.

Most people would think such long-continued kindness to myself ought to have satisfied me ; but, to my shame be it said, it did not, for on every occasion that I came in contact with a poor workman in need of medical advice, I gave him a note to the Doctor, and in all cases the same kind attention was

given, and in many cases pecuniary assistance. I did once feel ashamed when I called at nine o'clock at night and you had company dining with you ; but as soon as he could understand that I was apologizing for calling at such an hour, he stopped me, saying, I was the best patient he ever had, and to me his door was always open. You know well how freely I availed myself of this privilege, for your house was not safe from my visits, Sunday or holiday.

The concluding act of the Doctor towards me deserves particular mention, but has no claim to precedence over the many other acts in my remembrance. When he was leaving London, I was introduced to Dr. Reynolds, and a very particular *favour* asked of me, which I freely promised. It was that, in case of again being ill, I would call on Dr. Reynolds as I had on Dr. Hall. Soon after I did call on Dr. Reynolds, when the most prompt attention was given, and though he had five miles to come, the fee offered was refused, and on asking to what I was indebted for such consideration, was told I had been left as a legacy to him by Dr. Hall. This speaks volumes. I have also the happiness to say, that I now count Dr. Reynolds as another friend, granting me the same privileges for myself and family.

I have now endeavoured to give an idea of my knowledge of Dr. Hall, and I have no doubt that many have experienced his friendship and assistance in the time of need, who, if they knew you would like it, would gladly bear testimony to his worth. With me the remembrance of his friendship is the brightest of my life.—I am, dear Madam, ever most sincerely your obliged servant, S. GEOGHEGAN.

The following passage, extracted from the letter of an inestimable friend, is replete with truth and feeling, and although it was never intended for the eye of the public, I am sure I shall be forgiven for introducing it here.

My dear Mrs. Hall—I have written a few recollections of

one or two of your beloved husband's kindnesses to me; but were I to state all that I have witnessed of his kindness to myself and others, I should be laughed at, and, what is worse, not believed. The winning manner in which he conferred the most important benefits, and the glow of joy which lit up his countenance when he observed the effects of his benevolence, must have been known and seen to be appreciated.

Time developes more and more painfully the irreparable loss which all have sustained who knew him. Just in the degree in which he was known did his friends draw from him their most precious moments of enjoyment—&c. &c., A. D.

Mr. Wakley, who always nobly upheld the fame and the good name of Marshall Hall, with that rare acuteness and sagacity for which he is so remarkable, from the first moment of his acquaintance with him highly appreciated his character. I venture to quote the following expressions, as true as they are forcible, from a letter of Mr. Wakley's:—

When writing of such a man, language is felt to want power and to be inadequate to express the force both of feeling and opinion. The more I think of Marshall Hall, the more I admire and love the noble qualities of his heart and mind. In power of intellect and simplicity of feeling he was a wonder. With him the love of truth was a passion. Hence the enormous value of his vast labours.

It will not excite surprise that I should have noted down and treasured up some expressions used by Mr. Wakley in conversation. They were these precisely:—"Your husband was *the most conscientious* man I ever met with. He was like an infant in purity of mind." What Bishop Burnet said of Sir Isaac Newton might with equal truth be applied to Marshall Hall—"He had the *whitest soul* I ever knew."

The following remarks are from the pen of Mr. Marshall Hall Higginbottom :—

During my studentship in London, extending over a period of more than seven years, few weeks elapsed without my spending some hours in the society of Dr. Marshall Hall, and during the latter portion of that period I had almost daily engagements with him. Few had better opportunities than myself of judging of his character, and one of its most distinguishing traits was, his evenness and equanimity of temper; still he was capable of being roused; but, I believe, only by what he considered to be dishonourable or underhand conduct on the part of others; subterfuge, duplicity, prevarication, and injustice had his unmitigated detestation. His standard of truth was most exalted, and truly did he measure his own conduct by that standard. Any deviation on the part of others excited his indignation, and was often accompanied by a withering rebuke. His own conduct was most transparent, and he was naturally very unsuspicious of others. His promise, however slight, he ever after regarded as a sacred pledge. I never knew him to exaggerate, or knowingly to permit it in others; the slightest deviation from truth or rectitude was abhorrent to his nature, and he could not gloss over the want of veracity in others. Wherever he met with untruthfulness or sinister motive, he would expose it, saying, as I have often heard him, "I neither will, nor can, give my consent to a lie." I never knew any individual more strictly guided by principle; the question "right or wrong?" once decided in his own mind, the right was followed, no matter what the sacrifice or the difficulty; neither expediency nor inclination weighed one jot in the balance.

There were qualities associated in Marshall Hall which are perhaps rarely found in combination. With great firmness, determination, and perseverance there was a complete absence of obstinacy.

With a philosophic mind and great force of character,

he possessed the warmest heart, the most sensitive nature, and the gentlest manners.

Remarkably quick perceptions and rapid thought were in him combined with great accuracy and sound judgment.

I have already noticed another peculiarity of his mind—accurate observation of minute details, together with the more rare power of combining these so as to deduce vast and important *principles* or laws in science, which again were *applied* by him *practically* and extensively.

Gratitude was a very strong element in his character. The least kindness received excited in him a warmth of feeling which never subsided, and manifested itself in every possible way.

There was nothing domineering in his character, nor had he any love of ruling others. Such dispositions as could be influenced by love and kindness would yield to him; but the complete absence of anything approaching to sternness would have disqualified him for that rule over others which involves severe discipline.

In all his habits he was particularly neat, being simple in his dress and rather indisposed to change with the fashion. His care of his books was almost fastidious; but I must confess that his papers were not kept in the very best order, and consequently there was often an appalling accumulation of these on his writing-table, his excuse being, that he had not time to arrange them, and any order attempted by another was apt to confuse him. In the printing of

his works he was extremely particular; all his title pages are models of their kind. In fact, so unimpeachable was his taste, that the ladies of his family considered themselves fortunate when he, with his usual goodnature, chose their shawls and dresses. He had a quick and correct eye on all occasions. His handwriting, although sometimes difficult to decipher, owing to its rapidity, was always neat, and fair to the eye; and he was precise even in the mode of folding and sealing a letter. A coarse manner of doing anything annoyed him. In fact, he possessed a truly refined mind and taste, which tinged everything he did. In common with his father and his brother Samuel, he was gifted with much mechanical genius, being very quick and skilful in devising ingenious contrivances, and fertile in resources. His Pneumatometer, already alluded to, and constructed under his own direction, was an instance of this.

He was too much occupied with his professional studies and practice to pay much attention to politics. Without being a partisan, he rejoiced in good measures, from whatever quarter they emanated. His opinions were liberal, and he desired the reform of every wrong and injustice. In society he knew no difference in regard to nation or creed; yet he was loyal and patriotic in the highest degree, and an ardent admirer of our noble constitution—taught especially by observing, and contrasting with its influence, the state of things elsewhere.

In religion he held strong and firm opinions, receiving its truths as foreshadowed in the Old

Testament, and set forth in the full blaze of light in the New, and as a Divine institution, separate from all that is human. To him Christ was all in all—Saviour, King, and Lawgiver—of whom it is written in the sacred oracles, "Thy throne, Oh God, is for ever and ever." The law of Christ, so clearly set forth in the New Testament, he regarded as absolute and imperative upon the Christian, and not in the minutest degree to be put aside or neglected for any law of man. This *principle* was his guide through life, in many trying circumstances. On one occasion, being subpœnaed on a criminal trial at the Old Bailey, he firmly refused to take an oath, and risked imprisonment rather than do an act which he considered contrary to the law of Christ. For the same reason, he forfeited a considerable legacy, left to him by a relative, as executor under her will. On another occasion he declined a large fee for attending a civil trial on a distant circuit, because it involved a similar breach of the Divine command. In numerous other instances his strict adherence to his principles was greatly detrimental to his worldly advantage; yet this never induced him to sacrifice one iota of them for any earthly consideration.

Confessing Christ without ostentation, of him it might be said, as of one of old, "We shall not find any occasion against him, except we find it against him concerning the law of his God." He considered these things as sacred, and not to be interfered with by any one, and that persecution of any kind for conscience sake, or for opinion's sake, is of all things the most odious and tyrannical.

He who was so eminent for his powers of reasoning on scientific subjects, was as a little child in his religious faith and obedience. His honesty of character did not allow him to be partaker in anything which involved what was contrary to his conscience, whatever loss or odium this might entail; and it did entail much. To a friend he said, within the last year of his life, "I have suffered much for the Truth's sake." His actions and their motives were simple and guided by principle, without reference to the opinion of the world. I never knew any one more devoid of the fear of man.

CHAPTER XII.

DOMESTIC CHARACTER.

I HAVE already entered much into the details of the domestic character of Marshall Hall. Indeed, it may be thought by some that I have been unnecessarily minute in these records; I have, however, been influenced by the consideration that, as Dr. Davy, in his charming "Remains,"* observes,—"The estimation of character must be founded on little things as much as on important events—perhaps even more so."

Yet, after all, it is difficult—nay, impossible—to describe those finer traits of character which impress themselves upon the every action of some; they are too delicate and subtle to be delineated; they can only be *felt*.

Such of my readers as really knew my husband's excellence will constantly feel, in perusing these pages, that I have failed to do justice to the original; whilst those who knew him not, or but imperfectly, will be apt to imagine that I have exceeded it.

There exist, in the material world, scenes of such surpassing sublimity and loveliness, that even the artist possessed of the most consummate skill shrinks

* "Remains of the Life and Writings of Sir Humphry Davy." By his Brother, Dr. Davy.

from the attempt to transfer them to his canvas, conscious of the inadequacy of his art to represent the reality.

So with the moral world. There is a purity and a beauty of character which the tongue and the pen alike fail to depict.

It still remains for me to speak of Marshall Hall more particularly in the nearest relations of life: and here it was that he pre-eminently shone.

As a son, I need only refer to the letters he addressed to his father while at Edinburgh, in which the earnest desire to gratify that parent by his good conduct and attainments, and the honourable endeavour to spare him expense, are conspicuous. The same affectionate consideration marked his conduct towards his parents as long as they lived. His mother, of whose gentle qualities I have already spoken, derived great pleasure from paying us an annual visit in London, till her death, at the age of eighty-four. We were a very happy party when she and some other members of the family joined us. My husband spent all his spare moments with us, and endeavoured by every means in his power to render the visit enjoyable. Always bright and cheerful, he was the sun and centre, the life and joy, of the family circle. He delighted to see his friends around him, and was himself happy in his ceaseless efforts to render others so. An observant friend relates that "he used to run up-stairs into the drawing-room, and, looking anxiously and affectionately at his mother, inquire after her health, making her smile at some playful

remark." The entire and childlike confidence which she reposed in him was beautiful.

The reflection that he had contributed to the happiness of his parents was a source of great satisfaction and pleasure to him to the very end of his life.

By his sisters he was deeply loved; throughout life his conduct was such as to inspire them with the most unbounded confidence and the warmest affection, and his only surviving sister will never cease to feel that in him she lost the ever-ready and efficient friend and counsellor as well as the beloved brother.

His nieces regarded him as a parent. The following letter from one of them speaks for itself:—

My dearest Aunt—In saying anything respecting my beloved uncle's kindness to my sisters and myself, I feel *quite overwhelmed,* for truly, words fail to express half I feel.

From our days of infancy he never ceased to manifest the most affectionate fatherly interest in our happiness and welfare. When I review the past, I do believe there never was such an uncle.

When my sisters and I were at school, near London, and far from home, his kindness was such as we can never forget. He never failed in his Saturday weekly visits, sometimes taking us to town for the Sunday, and always cheering us with his smiles and kindness; those bright spots in our school days have left an indelible impression on our hearts which time can never efface.

He never ceased to take the deepest interest in our health, education, and happiness; this, combined with an extremely kind, cheerful, and even playful manner, could not fail to win our warmest affections.

I can truly say that until death deprived us of this much-

loved uncle, we knew no change in him, for his kindness and affection towards us rather increased than diminished; and I feel I must say a word respecting his untiring generosity towards us.

Our libraries and wardrobes were constantly enriched by his most kind and valuable gifts, and we were also indebted to him for many a delightful journey, especially that memorable one to Switzerland, where we first saw the land of alps and valleys and perpetual snow. I am even now writing this letter with a beautiful gold pen which he kindly gave me on his death-bed.

Death, that dread severer of the dearest ties, has deprived us of this beloved uncle. One regret remains—that whilst he was here we did not love and value him more.

I feel, my dear aunt, that I cannot conclude my letter without expressing our sincere gratitude and thanks to you for the affectionate manner in which you have ever responded to our beloved uncle's kindness and generosity towards us.

With much love and sympathy from all of us, believe me, my dear aunt, your very affectionate niece,

ANNE HALL HIGGINBOTTOM.

I feel that I should but very imperfectly depict the character of my husband, were I to omit so bright a part of it as is revealed in the following extracts from his letters to myself. My feelings, as may be imagined, have caused much hesitation in coming to the decision of publishing these sacred expressions; but believing that I could not otherwise convey any idea of his devoted affection, I have resolved to sacrifice those feelings to a strong sense of my duty as a faithful biographer.

His extreme anxiety for our son's health led to my accompanying the latter to the shores of the Mediter-

ranean in the winter of 1844-5. He felt that he could not intrust our delicate boy to the care of any but a mother. Thus, with his usual unselfishness, he sacrificed his domestic comfort for the good of his child. The proposal was his own, and he thought he could have borne the absence, as he said, "for a time, for some great good;" in another letter saying—"I verily thought I could live for several months without thee. But that dream is at an end. My mortal existence is in thee." Friends sought to cheer him during this absence, but he was inconsolable. He wrote to me—

I have no joy—I never have had a joy since I knew thee, but thou wast inseparably linked with it. I know not that I have a *thought* separate from thee. Any little fame I may have acquired I prize because thou dost—dost thou not? and the boy *will*—take pride in it.

At that period the postal communication with the south of Europe was much less frequent than now, and in Italy the transmission of letters was uncertain; one or two of mine never reached him, and his anxiety was intolerable. The account given me afterwards by friends of his utter misery at this temporary separation has often made my heart ache. His health was injured, and he said—"I never was so weak and low in mental powers. Come now the happy day of our meeting—come quickly! We will never (D. V.) part more—never, never."

Unfortunately I caught cold and had a severe attack of bronchitis, which added to his unhappiness. The only time in his life that he ever found serious fault

with me was on this occasion, for not taking due precautions at the commencement of my cold. He then wrote:—

Thou knowest better than all the doctors in the world how to have treated—and how to treat—first thy cold and afterwards thy bronchitis; I therefore say nothing. Thou didst neglect the former; do not now neglect the latter. I can say no more. I am powerless and can do nothing, and I feel this grievously. In Gibraltar thirty-six hours in bed would have cured thee. In Malta thou shouldst have gone to bed and have remained there until thou wert well, quite well. Wouldst thou not have treated the boy so? I *wonder*, with an aching heart, how thou art now. One thing I have been taught afresh—my intense love, my timid love for thee, and how thou art my SOLE treasure, hope, joy! Never, never, never, will I trust thee away from me more; no, never!"

His letters reiterated injunctions to take care of my health and that of our son. "Think not of expense," he wrote, "once more I charge thee not to think of expense; but do that *precisely* which is for thy health and that of the boy." Mentioning a large sum of money, he adds:—"Thou hast this at thy entire disposal to spend as thou wilt, besides the ordinary expenses. Spare it not. Purchase every comfort." His anxiety exaggerated my malady, and although I assured him that I was better, and that there was no cause for fear, he said—"Send me instantly a certificate from Dr. Deakin. Let him examine thy chest well and carefully with the stethoscope, and disguise nothing. If I think I see disguise I shall be miserable—nay, I think I shall die. Let it therefore be frank and full."

Although very difficult for him at that season of the year to leave his large practice, he determined to come to us, and had actually set out, when at Dover he was attacked with severe illness, and so detained; and then better accounts of my health re-assured him. On the 27th of March he wrote:—"Dearest Charlotte, if thou wert called away, I *feel* that I should die the most painful death—that of a broken heart. Well, then, may I implore thee to take care of thy health." The same idea is repeated in many letters:—

I may well wish thee to be careful, for *my prayer*, my special prayer to my God is, to take me when He taketh thee, and not to leave me to linger out a miserable existence—or rather death. Yes, my God, my God, take me, take me when Thou takest her who is the sole joy and consolation of my heart! and until that day of Thy appointment, keep us both in Thy perfect peace and joy in Christ. Amen.

In another letter he says:—"Thou knowest my prayer which I pray always—to be taken with thee when thy day of glory shall come."

The number and length of his letters were extraordinary. On arriving at Rome I found a vast collection of them awaiting me at Torlonia's bank. In one of these he says:—

Dost thou wonder at my much writing? I will tell thee my secret. I never taste food but my paper is before me. I never go to bed, but my pen, ink, and paper are with me, and I write if I awake, which I always do, in the night. I am a man of one feeling—love; love to thee and the boy. I want nothing in this world but thee and the dear boy—and you happy. Heavenly Father, grant me, grant me *this!* Gold and honour have no charms for me, but you two only! And now, peace,

and comfort, and joy in Christ, in the fulness of His blood and righteousness, and of His sure promises, be with thee. Our heavenly Father will re-unite us in due time. May He give us patience to wait; and may He bless us in our dear boy and in ourselves.

When the return was fixed, among the many pages of joy which his heart poured forth, was the following:—

Be thou happy on thy long, long journey, thinking of my love, of my joy and gladness when I shall see thee! Already these thoughts are making me well. I feel it in *every* thing. Thy return is to me as that of the morning sun to those who have watched through the dark and dreary night—or, rather, the dark and dreary season of an Arctic winter!! Winter indeed has thy absence been to me, dearest Charlotte! dark and cold.

I offer no comment on these effusions of the warmest and tenderest of hearts; they are beyond all comment. It has cost me a great effort to reproduce them here; but in so doing I have acquitted myself of what I deemed a sacred duty to that loved and revered memory. At the period when these letters were penned, we had been married sixteen years. After the lapse of twenty years he wrote:—"How far dearer is the wife than the bride!"

The most solid and durable foundation for affection is *respect;* and I can truly say, that the more I knew of my husband's character, the more exalted was my opinion of him, both as a Christian and as a man of rare mental endowments. During an experience of thirty years I never knew him guilty of any departure from his principles, or from what he believed to be the exact truth.

As a father, he had to suffer much anxiety on account of the repeated severe illnesses of our son during infancy and boyhood, and in all these he was to him not only the skilful physician but the tender nurse. Never was he so happy as when our child was with us, and I cannot recal one single instance of his complaining that he was troublesome or that he interrupted him. The exertions he made to give him pleasure, as well as to imbue his young mind with the highest and purest principles, and early to engraft scientific facts on his memory by amusing little experiments in chemistry, natural philosophy, and every useful subject, were unremitting. No trouble, no expense, no personal inconvenience of any kind was ever thought of for one moment when the welfare and advantage of his son was in question. My friend Mrs. D——, who was often in our domestic circle, says of him, as a parent, "His tenderness and indulgence, if equalled, could not be surpassed by woman's love."

I feel how impossible it is for me to give any idea of his parental devotion. Happily my son has preserved a great number of his dear father's letters to him, and I am thus enabled to make the following quotations. The first was addressed to him at a very early age :—

14, Manchester Square, June 13th, 1838.

My own darling Boy—I hope you enjoy your occupation on the beach and your walks on the cliff, and that you are also very attentive to your lessons.

I expect to see you with rosy cheeks when you come home on Tuesday next.

You know that the Queen is to be crowned on the 28th.

There is to be a grand procession, and I hope we shall go to see it. There is to be a fair, too, in Hyde Park, and a splendid illumination. You will, I think, long remember the coronation of Queen Victoria.

Remember that Jesus Christ came into the world to save sinners, and that He will receive *all* who come to Him in their hearts, and will love them, and they will be with Him in heaven when they die.—I am, my darling child, your affectionate father, MARSHALL HALL.

14, Manchester Square, Oct. 19th, 1838.

My own dear Boy—I want you to read a little to yourself every day. It may be something interesting, as "Robinson Crusoe." When I was a little boy, I used to lay "Robinson Crusoe" under my pillow and read it as soon as I awoke in the morning. And afterwards I read about philosophy. I want you to be well informed, for it is *education* which makes the best difference between one man and another. Remember what I always keep for the *last*, because the most important thing I have to say—that to know Christ passeth all other knowledge; for other knowledge is for time, that of Christ for eternity. We are all sinners, and Jesus Christ is the Saviour of sinners.—Good-bye; darling boy, your own affectionate papa, MARSHALL HALL.

14, Manchester Square, Oct. 23rd, 1838.

My own darling Boy—I shall soon, I trust, see you at home, and that will give me great joy.

Before you come, walk to the end of the pier, and take a survey of the heavens, and then look over the sea all around, and then think how deep it is, and then that God made all these things, and that He is as *good* as He is *powerful*.

I went by the railway, and as I went I thought of you, and of "parallax," and of "vanishing lines." Do you remember about this?

Have you studied "Proportion" since I left you? The rules apply to ovals, and triangles, and cones, and indeed all surfaces and solids. I shall ask you about them when

you come home.—I am, my dear boy, your affectionate papa, MARSHALL HALL.

14, Manchester Square, Dec. 29th, 1839.

My dear Boy—I am sure you will be much pleased with the nice hunting-watch which mamma brings you.

I hope you are a very good boy, and that you cheerfully attend to your lessons, and that you are very attentive to what Mademoiselle S—— and Miss E—— tell you and teach you. I would have you, first, good, and virtuous, loving to please mamma, and papa, and all good people; secondly, wise and well-informed. Remember that *truth*, and *virtue*, and *science* are the most beautiful things in the world.

Above all, remember that *all are sinners*, and that *Jesus Christ died to save sinners*. Remember what I read to you one day about the *proud Pharisee* and the *poor Publican*. Remember the poor Publican's *prayer*—"God be merciful to me a sinner."

I hope to see my boy very stout and well when he returns from Brighton.—Good bye, my dear boy. Your ever affectionate papa, MARSHALL HALL.

14, Manchester Square, Jan. 12th, 1840.

My dear Boy—I promised to write to you, and you see I keep my word. We should always keep our word and speak the truth.

I hope your cold is quite well, and that you now enjoy your strolls along the beach.

Do you ever think of papa, and how lonely he must be?

I send you a very nice History of England full of illustrations—that is, pictures. I am sure you will like it very much. It is abridged from Hume and Smollett. Mamma will tell you who they are.

I expect to find you very perfect in the Concords, &c., when you come home. Mr. H—— will be quite surprised.

But all history, and all philosophy, and all knowledge is nothing compared with the knowledge of Jesus Christ—"*Whom to know* is eternal life." St. Paul wrote these words to his beloved Timothy:—"This is a faithful saying, and

worthy of all acceptation—that Jesus Christ came into the world to save sinners, of whom I am chief." Remember these words, my darling boy! Remember the prayer of the poor Publican, and the boasting of the proud Pharisee! Remember that the Lord was pleased with the former and displeased with the latter.—I am, my dear boy, thy affectionate father, MARSHALL HALL.

London, Sept. 9th, 1840.

My dear Boy—I was very glad to receive your letter. It had only one fault, that of being too short.

I hope you are very attentive to your lessons. Remember my old maxim, "Play when at play; work when at work." This is the way to be both clever and active.

Read your Latin very attentively and pay great attention to your French. I hope you will make great progress in both during the next year. It is time now, for in February you will be ten years old.

It will soon be full moon, and then I wish you to observe whether the tide be highest when the moon (or the sun) is at the meridian, or a little after. I say, or the sun, because the sun and moon are then in opposition.

I am now going to Moorcroft, and I want my little companion to study parallax and vanishing lines with me. Who is that, do you think?

Be a good boy; and oh remember at all times that Jesus Christ died to save sinners, of whom, each of us may say, "I am chief."—Your affectionate papa, MARSHALL HALL.

14, Manchester Square, Oct. 25th, 1840.

My dear Boy—I hope you are, with mamma, enjoying the sea breezes, and that they will do you both great good. I want you to grow up strong and healthy.

But I also wish my boy to grow up with a high sense of *honour*, *truth*, and *virtue*, and with a love of *science* and *literature*. Without these, a man is, in my opinion, lower in the scale of creation than some animals, a horse for instance, and is unfit for any elevated post in society.

But FAR before even all these things is the knowledge of

Christ, the Saviour of sinners, "Whom to know is life eternal." For who hath not sinned? Who needeth not a Saviour? Then, how blessed are they who, knowing and feeling themselves sinners, come to Christ, the only Saviour of sinners.

I shall hope to have a letter from my dear boy shortly, perhaps to-morrow. Be very attentive to your lessons and to all that mamma says.—I am, my dear boy, your affectionate papa, MARSHALL HALL.

14, Manchester Square, Oct. 30th, 1840.

My dear, darling Boy—Your best of mammas sends me word that you are a good and attentive boy, and this has made me very happy, and I hope you will be happy to hear it.

There is a *dignity* in *virtue*, a *beauty* in *truth*, which makes them very precious. A good boy does not do wrong, because, though nobody might know, or even if God did not know it (which is impossible), he himself would know it, and lose the sense of his own dignity, his self-respect.

Such a boy despises, whilst he pities the liar, the deceitful boy, and absolutely hates his vices.

But the best are imperfect. Our very *righteousness* is but as *filthy rags*. All are sinners. Christ is the *only* Saviour of sinners. But He *is* the Saviour of sinners, and of *all* who come to Him not one will be cast out.

I shall think it long before I see my dear boy and his dear mamma. But as long as he is a good boy I cannot be unhappy.—I am, my dear boy, your affectionate papa, MARSHALL HALL.

14, Manchester Square, Dec. 2nd, 1842.

My own darling Boy—I have been too busy even to write to you, so you must be sure that I have been very busy indeed. Soon, soon we shall have you with us, and this will make us very happy—yes, *very* happy.

Be sure you consider how your holidays should be spent, and where. I want them to be merry holidays. Tell Mr. —— that I shall look for one of his nice long notes. They are, with yours, my weekly *treat*, and have always lately made me very happy and done me good.

How happy must you be, my dear boy, in giving such joy to your fond parents! You will never possess a purer source of pleasure, never!

Farewell, my dear boy. Soon will we sing *dulce, dulce domum* together; or, rather, you and mamma shall, and I will listen!

Remember always that Jesus Christ is the *only*, but *the*, Saviour of sinners, and that he who names the name of Christ must depart from iniquity.—Ever your affectionate papa, MARSHALL HALL.

June 3rd, 1845.*

My own darling Boy—I should *die* if you were not good, truthful, honourable, and happy! I think of you constantly. *No papa so loves* his boy. For you I toil all the day. Of you I think at night, in the morning—the last thing and the first! I could *die cheerfully* at this moment to secure your happiness. . . . .

Take your note-book and pen and ink *with you*. What comes *fresh* from observation is always the *best*. It is like a rose or other sweet-scented flower, its perfume is most fragrant when it is first gathered.

Soon, my dear boy, let me hear from you. Remember we love you dearly, more dearly than I can say.—Your affectionate papa, MARSHALL HALL.

June 24th, 1845.

My dear, dear Boy—Do all this *well* until the beginning of September, and then we will have a holiday together, and, I trust, enjoy ourselves. Indeed, indeed I have and can have no joy except such as is associated with your dear mamma and yourself!—Your most affectionate papa, MARSHALL HALL.

July 18th, 1845.

My dear Boy—I am glad you are pleased with Wordsworth's "Athens and Attica." It denotes good taste. I trust the *reality* will please you still more. I shall shortly send you "Greece," by the same classic author. It is *perfectly beautiful*. What a *colouring* a knowledge of the classics

*Written after I had left our son at Rome, under the care of a tutor and of a medical relative.—C. H.

diffuses over these works! What a delightful, or rather delicious thing is the possession of such knowledge! It sheds its lustre over a man's life, occupations, reading, conversation, correspondence—everything! and fits him for the highest society.

And how glorious is this Greece! this Athens! As the sun is the original of natural *light*, so is it of the light of

1. Poetry,
2. Eloquence,
3. Architecture,
4. Sculpture,
5. The Drama, &c. &c.!

It is wonderful and admirable. And to *feel* all this, a man must be a CLASSIC! The *first steps* to become this are not pleasant (as you, my dear boy, now feel); but what do you think are the pure delights of such a scholar as Wordsworth? Is not this worth working for?

Study then, well, my boy, and accomplish what will shed a lustre over your future career, whether of labour or enjoyment. Do it *con amore*. Do it with this object, and for a just and honourable distinction.

I am glad you are pleased with fishing. I have sent you all essentials, I trust. Work *and* play—work when at work, and play when at play, with equal energy—was my *first* maxim and injunction, and it is *good still*.

I hope to hear you speak the German fluently when we come. This will give me real delight, and your dear mamma, too. Think of this, and lose no opportunity of practising and speaking. Never mind a few blunders. Dash at a phrase on all occasions, and you will soon speak correctly as well as easily. Do the same with the Italian and French with your masters.—Your most affectionate papa, MARSHALL HALL.

June 26th, 1845.

My own dear Boy—I am anxious that you should have the Italian lessons of the best master, at any price.—Of religious principle, I can only repeat what I have said and

written ten thousand times, that we are *all sinners*, that Christ is the *only* Saviour—that He does save all who come to Him for Salvation, and that he who names His name must depart from iniquity. But strive as we will or may, we all fall short: Peter denied Christ thrice; to His blood, then, we must come DAILY; but doing so, we are *clean*, every whit, and SAVED. Nothing can be added to this, except that there is a *Crown* of Righteousness in store for all who look for the coming of Christ in glory! Everything is comprised in one word—CHRIST! He is all in all. He is our only, but perfect, *Saviour!* And He says, "Come unto Me, *all* ye who labour and are heavy laden, and *I* will give you rest!"

And now, my dear boy, I have only to add—what indeed I cannot say—how we love you. We live but for you. Two things I desire for you in this life—that you be noble in conduct—thought, word, and deed—and very happy. I think I told you of the two temples of Virtue and Honour, and that there was only one way into the latter, viz. that which led through the former! This is true. And a third temple might be imagined, the only way into which would be through *both* the former—the temple of *Happiness*.

You see what a long letter I have written to you. I long to see you. But until I can do so, it is a great relief to me that I can talk with you on paper.

Be a noble, industrious boy, and you will reap a rich reward, and WE shall be HAPPY!—Ever your affectionate papa, MARSHALL HALL.

P.S.—Cuvier speaks of *Medicine* as "la plus étendue des sciences, le plus utile des arts, et l'état le plus digne d'un homme dont le cœur est animé de l'amour de ses semblables."

August 1st, 1845.

My dear Boy—You must learn not to care whether . . . . It is only like the *world*, who are selfish and care for themselves only, and have no consideration for others. How have *I* been not only *neglected*, but *opposed*, in my discovery, and in my career!

Once more—this is a *lesson* in addition to those of Latin

and Greek. Learn it you must, one day. It is a painful lesson, too, and the sooner learnt, the better. Rather thank those to whom you allude, for the benefit they undesignedly confer on you.

You will, I am sure, enjoy your tour with us. You will repeat your lessons to me, and then we will together visit and enjoy everything that is to be seen. We will talk over history and philosophy, and the great things we witness in nature and art!

We have got some large prints by Piranesi, which are *bold* and *beautiful*. I mean his representations of the monuments of Rome, &c., for his figures (men) are the most strange things possible.

I want something on Athens and *its* monuments. There is a German work in folio; Mr. ——— will inquire about it for me.

I want to adopt measures to fix on your memory all you will have seen of the monuments of Athens and Rome.

Does your friend —— give way to you in everything? I hope not; for this would not be good for you or any boy. *Boys* should experience opposition, for, as *men* they will meet with plenty.

. . . . I began to study in earnest precisely at your age, and I have made my own fortune and yours, such as it is. You are better off, my boy. You will just have the fortune which will *fit* you for success. I had not a farthing; I began by borrowing. I worked hard and paid what I owed, and have earned a moderate competency for mamma and you! And I am most *thankful*. Do you be so too, my dear boy, and work and amuse yourself with equal energy and earnestness, and make your papa's and mamma's hearts bound with joy. "Make them a good old age!"

I am going to study climate, or rather, weather and all about the *winds*, &c. I expect you will join me and be very much interested with my subject.

Alluding to the amiable expression of a young German friend, in reference to his father.

I wish I knew all about volcanoes. We must talk this subject over together. Sulphur, and carbonic acid, and water have a good deal to do with it.—Your affectionate papa, MARSHALL HALL.

May 17th, 1846.

My dear Boy—Sir Humphry Davy *discovered* that potass, soda, lime, &c., are oxides of metals (or metalloids), unknown before. He decomposed the potass by first moistening it to make it a conductor, and then passing a strong galvanic shock through it. A globule of bright metalloid appeared! He wrote in his journal "Capital Exp^{t}!"

(Archimedes cried out Ευρηκα.)

This, when put *on* water (for it is lighter than water), took fire!

When Sir Humphry Davy was afterwards investigating the nature of volcanoes, he bethought him of these metalloids and their inflammability on the contact of water. But if such were the *cause* of volcanic eruptions, there ought to be much *potass*, soda, *lime*, &c.—the oxides of his metalloids—in the lava, ashes, &c., and I do not think there *is*.

I send you a sketch which I had previously prepared for you. I think every link in my chain of argument *firm*, but I shall be glad to receive your opinion and criticisms. Nothing should be admitted without facts as proofs, and Sir H. Davy's idea of the metalloids wants proof.

I return your MS. Keep all these papers together. I shall send you something more on this subject. But let me know your remarks.—Your most affectionate papa, MARSHALL HALL.

No date.

My dear Boy—You who have been in a land of volcanoes can have no doubt of the existence of subterraneous *heat*.

Let us consider what it must do. If there be water, this must be like that of a high-pressure steam-boiler—ready to burst forth with fury and immense power.

If there be limestone, the carbonic acid must be in a similar condition! If there be sulphur, this must also be in a similar case! All these are *vaporizable*.

Many other substances—too many to enumerate—are, singly or when heated together, fusible. Some of these are *inflammable*. Grand is the catastrophe when (water probably flowing upon the incandescent materials) these pent-up substances get loose, forcing their way and rushing through the crater—gases, vapour, water, molten lava, flame, ashes, &c. &c. !

Some of the carbonic acid finds its way through the porous rock to distant water, by which it is absorbed in great quantity, under the influence of such immense *pressure*. This water, so charged with carbonic acid, becomes capable of dissolving limestone, protoxide of iron, &c.

These, when the water finds its way into the open atmosphere, the pressure being removed, and the carbonic acid escaping, are deposited—the former in the form of marble, or travertine, as you saw near Tivoli; the latter, more oxygen being absorbed, assumes the form of sesqui- or yellow oxide, as at Tunbridge Wells.

Such is the origin of these and many other forms of what are called mineral waters.

Some of these are cold; some quite warm, as the Kochbrunnen, at Wiesbaden, as you may remember; others boiling hot, as the Geysers of Iceland, the effect of subterranean heat.

Sometimes the high pressure raises the very ground about it. Pompeii is so raised, and the sea line removed farther off; a fact which is also illustrated by the fact of the Monte Nuovo, raised in the middle of the Lucrine Lake; and of the Temple of Jupiter Serapis at Pozzuoli. The latter has, indeed, been first depressed and then raised again, by these volcanic freaks; but all those rocks and mountains termed volcanic, such as those which constitute the beauties of the Rhine, have been so formed; whilst others, not volcanic in their structure, may have been up-raised. A new volcanic island recently made its appearance in the Mediterranean, and is described by Dr. Davy.

The immediate explosion is probably induced by water overflowing the immense incandescent mass; this is generally sea water, almost all volcanoes being in the immediate vicinity of the sea, and so Sir Humphry Davy found the vapours arising from the sides of Vesuvius, which are doubtless raised

in a great measure mechanically, to be of the composition of sea-water; whilst from some of the volcanoes of America situated far from the sea, *fishes* have been ejected.

May 17th, 1846.

My dear Boy—What do you think I am going to write to you about to-day? That mixture of three things, so terrible in its effects—gunpowder!

What are those three things of which gunpowder is composed? And what is the object of each?

But first what is the object of gunpowder itself!

It is to induce the sudden formation, from a substance of small bulk, of a large volume of aëriform matter, effecting an explosion.

The things of which gunpowder consists must be of this character. But another object must be ensured—the powder must easily *take fire*.

Well, then, common gunpowder consists of sulphur, charcoal, and nitre, in the proportion of 1, 1, and 5.

Sulphur, as you know, easily takes fire. On this account it is used to tip matches. Charcoal is characterized by its great attraction for, and ready combination with, oxygen, as you see in a common bonfire; and though solid itself, it becomes gaseous when it has undergone this combustion—viz., carbonic acid gas. Nitre has an opposite property. It contains much oxygen, held by a very feeble attraction, and therefore parts with it readily. Thus, if you mix charcoal and nitre together very intimately, the former is ready to seize, and the latter is ready to abandon, its oxygen. The result is the formation of a vast volume of carbonic acid. There is also another result. The nitre contains nitric acid. It is a nitrate of potass—that is, a combination of nitric acid and potass. The nitric acid consists of oxygen and nitrogen, the very gases which constitute our atmosphere.

United with potass, it assumes a solid and crystalline form. But when under the influence of heat (produced by the burning of sulphur) and in immediate contact with charcoal, it undergoes decomposition; the greater part

of its oxygen forms carbonic acid with the charcoal, whilst the nitrogen of the nitre is liberated in the gaseous form.

Thus the sudden formation of an enormous volume of carbonic acid and nitrogen gas, expanded too by heat created during the process, produces the well-known terrible effect of gunpowder.

The action of charcoal and of nitre, the former in seizing, the latter in evolving, oxygen, is shown in other experiments. Charcoal, heated in contact with an oxide of lead, seizes its oxygen, and reduces the oxide to its metallic state. Paper imbued with nitre becomes touch-paper, and will burn, though not with *flame*, in nitrogen gas,—that is, the combustion is maintained by the oxygen in the *nitre*.—Your affectionate papa, MARSHALL HALL.

June 1st, 1846.

My dear Boy—We arrived safe last night, and hope you did so this morning.*

Let us have a long letter soon. Tell me what you think of the *vast* and *almost universal* agency of oxygen. It is in the air we breathe and in the water we drink. It is the most powerful material agent in nature. If a body *burns*, it is the *rapid* combination with oxygen. Oxygen means, as you know, *acid-making*. *Sulphur* becomes *sulphuric acid;* charcoal, carbonic acid, &c. If those compounds are not *acid*, they are called oxides. White lead, red lead, are oxides of lead. When the experiment (which you know so well) with a glazed card, or a red wafer, is made, the oxygen is taken away from the lead by the carbon, and the lead is said to be reduced.

Astronomy is the noblest of the sciences; then comes physics, and then chemistry; of these two, geology is a sort of compound. Every science, however minute the objects, as even insects, teaches us that there is, must have been, an all-wise Almighty Creator!

* We had met our son at Portsmouth. He returned to Ventnor, where he was at school, and we to London.

I forgot to tell you not to *dispute* on religious subjects, or indeed any other. State modestly your opinion if you like—but the less the better; and always write to me. You *know*, my dear boy, *how* (but you can never know *how* MUCH) we love you. This is the source of all our anxieties on your account. I strive that, when I am gone, you should revere the name and memory of your father. So does your dear excellent mother! We wish you so to pass your boyhood that you may be respected when a man.—Your affectionate papa, MARSHALL HALL.

14, Manchester Square, June 3rd, 1846.

My dear Boy—I wish you to look about and find the poorest and most afflicted person or persons in Ventnor, and to distribute amongst them. . . .

I consider the aged, the decrepit, the sick, the blind, the lame, as the most proper objects of charity in general, and bread the best form of it, though money is the most convenient form and the most prized.

Education consists not in cultivating the understanding alone, but the heart also. I would have my boy excel in both. You will have a nice little inheritance, and you must do good with it. A purely *selfish* person is the object of my abhorrence. . . . .

When the tadpole grows into the frog, it *rises* in the scale of life, and requires more oxygen. If it cannot get out of the water, it is drowned!

Every change in animals is from a lower to a higher state of existence; that is, every *anatomical* change; *physiological* changes, as in hibernation, may be from higher to lower.

I have a beautiful theory on this subject, which I will explain in a future letter, if you wish it.

How beautiful is science! How beautiful is Nature, whenever she is understood! And how much nobler is the mind occupied with the search into her arcana, than that which is engrossed with vulgar things!

I will send you the planaria another day. How are your tritons going on?

Remember my words—that Christ died to save sinners, and that all are sinners.

I particularly wish you not to dispute about religion (or indeed anything) with any one.

There is no religion in disputing; disputing is the sign of no religion, generally speaking.

We shall look for a long long letter from you.—Your most affectionate father, MARSHALL HALL.

June 9th, 1847.

My darling Boy—I wish you to examine the stocking-machine. Its *principle* is that of *loops*. The principle of the weaving-machine is that of warp and woof, or weft. Inquire what is that of the lace-machine.

Ask your cousins to show you "lace-running," and "chevening," and "clocks." Wherever you are, learn the things of the *place*. Lord Lyndhurst, lately Lord Chancellor, when Sergeant Copley, having to defend a certain patent, went and actually learnt to *work* on the machine!

I much wish you to understand the former and present processes of bleaching; your grandpapa first introduced the latter.

Have you seen Mortimer's Hole,† and the Druidical Holes? Write about them. Inquire about the Hemlock Stone, and, if you have time, go and see and examine it, &c. &c.—Ever your affectionate father, MARSHALL HALL.

June 16th, 1847.

My darling Boy‡—I am happy to see and *feel* that you place full confidence in me. Always tell me everything. My only objects in life are—to guide you from every evil into every good. If poor ——— had so trusted *his* father, he would not now be . . . . I want us, besides, to be, for I have known a few examples of such friendship, as brothers, rather than as father and son. Only pursue the path of honour, virtue, and happiness!

* Our son was visiting in Nottinghamshire.

† Beneath Nottingham Castle. ‡ Then at Bonn, on the Rhine.

You are a good boy, and I must tell you that this makes two hearts supremely happy. Your affectionate father, MARSHALL HALL.

The following letter, of a later date, on the choice of a wife, will not be without interest to the reader:—

38, Grosvenor Street, Jan. 6th, 1853.

My dear Boy—A noble career on your part—"the upright heart and pure" on hers—and pure and sincere religion on both, are the only security for happiness; the "idem velle," and the "idem nolle," are also essential. But before all, and above all—for I must revert to this—the bond of pure religion is the one bond which alone binds hearts together enduringly, in joy and in sorrow, in health and in sickness.

What I have said and written to you a thousand times, I now say and write especially and most emphatically—choose some noble pursuit and career worthy to occupy your time and mind; distinguish yourself in it; be useful to others, succour the unfortunate, assist the needy; in a word, occupy yourself *nobly*.

Above all, doing this, let your wants be moderate—and you will have enough without marrying one with a fortune.—Brilliancy in society is only a form of display and selfishness. Besides, *the beauty* of the *female* character is to be modest and retired, and therefore unnoticed. Display in a man is disagreeable; in a woman it is odious. Seek for some meek and gentle and kindly creature, without pretension and without display; and *be* the worthy object of her admiration for your virtues, acquirements, and well-earned distinction. It is an odious thing to see, as I have seen it, the wife everything in a house, and the husband nothing. It is unnatural and monstrous. Whoever your wife may be, then, be you yourself *distinguished* in some good and noble cause or career. Marry some one *worthy;* some one a little like your own mother; some one of whom, after twenty-three years and more, you may still be *fond* and *proud*.—&c. &c.,

MARSHALL HALL.

CHAPTER XIII.

HEALTH.

UNTIL the age of forty, I believe Dr. Marshall Hall never had a day's illness. A small eater and always abstemious, he was rather characterized by extreme activity than by any great degree of strength, his short stature and muscular, well-proportioned make conducing, no doubt, to the lightness and rapidity of his movements. May not the mental character also exert an influence in this respect? In 1830, he was attacked with severe jaundice. His system did not bear the usual remedies for this complaint a little tour on the Continent, however, finally removed it, except that there always remained a slight tenderness and enlargement of the liver. After this illness he adopted the plan of taking daily a digestive pill. After many trials of various preparations, he at length succeeded in prescribing for himself one which exactly suited him, and of which he continued the use daily for the remainder of his life. Its principal ingredients were *Barbadoes* aloes, first prescribed by him, as the

* I believe that Dr. Hall's treatment of his own case is described in his "Principles of the Theory and Practice of Medicine," §§ 1972 and 1973.

mildest kind, and soft soap.* After this, his health continued good until the sad affection of the throat, which commenced, as we have seen, whilst delivering two courses of lectures during the same session, in 1839. At a subsequent period he suffered from an attack of sciatica, which yielded only to very hot baths; and from a succession of painful boils, to which reference is made in the following letter to his friend, M. le Docteur Louis :—

14, Manchester Square, le 4 Avril, 1843.

Mon cher Ami—Votre dernière lettre nous a fait un bien grand bonheur. J'étais bien malade lorsque votre lettre du 1er Janvier est arrivée, et je m'étais refugié jusqu'à Douvres, pour y chercher un peu de santé; depuis notre retour à Londres j'ai remis de jour en jour de vous écrire, et j'avoue que j'avais peur que vous ne fussiez fâché contre moi. J'étais donc bien ravi de revoir votre écriture et de trouver que vous ne me grondiez pas.

Quant à ma maladie, c'était un abattement de forces inexprimable, avec dix à douze furoncless uccessifs bien douloureux. J'ai pris du sulfate de quinine, et maintenant je suis tout-à fait rétabli et en bonne santé.

Ma femme répondra à la plus aimable de lettres que nous venons de recevoir de la main de Madame Louis.

Comment se porte le petit Armand? Commence-t-il ses études? Y fait-il de grands progrès? Marshall est avec son

* A different prescription having had the name of Marshall Hall attached to it, I think it right to give the correct one. Though simple, the preparation requires great care :—Pil. Aloes dilut. Take of *Barbadoes* aloes, extract of liquorice, soft soap, and treacle, equal parts. Dissolve in pure water; afterwards inspissate with gentle heat, until of a proper consistence for pills. From three to eight grains, as required, to be taken *in the midst* of dinner daily.

This pill he prescribed much, and found invaluable—so much so, that he facetiously called it his "ruinous pill," for those who took it regularly, scarcely required a physician. He sent the formula to the Pharmacopœia.

instituteur à Ramsgate, toujours occupé à se préparer pour Eton et Cambridge. Quelle joie pour nous si ces deux enfans pourraient se rencontrer souvent et s'unir en une amitié durable!

J'ai reçu tout dernièrement une lettre de notre ami M. Shattuck, qui se porte bien et nous invite à traverser l'Atlantique pour l'aller trouver à Boston!

Votre livre vient d'arriver et je m'empresse de le lire—de l'étudier. Je ne veux pas penser que ce soit votre dernier ouvrage. Vous êtes encore jeune, et vous avez meilleure santé que moi, et je n'ai pas encore l'idée de la paresse. Il faut continuer. Je vous remercie de la place que vous y donnez à mon nom. Je mets un grand prix à ce qu'il soit associé au vôtre. C'est ma plus belle recompense . . .

Avez-vous remarqué la bronchite presque sans toux qui survient dans les maladies du cœur? Avez-vous aussi remarqué que la chlorose se termine quelquefois avec des symptômes d'hydrocéphale?

Rappelez nous au souvenir de Madame Louis et du petit Armand, et croyez que je suis toujours votre ami tout dévoué et de cœur.—&c. &c., MARSHALL HALL.

His maladies are alluded to in his travelling notes, the following cases being his own. It will not fail to be observed by the medical reader that the dysphagia disappeared temporarily:—

One patient had fallen into a sort of general indisposition, and had experienced most painful boils in rapid succession. When the seventh was most painful, he left England for France, proceeding to Southampton and along the now peaceful Seine. Before he reached Hâvre his boil had lost all its fiery inflammation and extreme tenderness; and it was the last. It is impossible to have a more marked example of the efficacy of a remedy.

A patient afflicted with that general indisposition which, from its frequent occurrence from the anxieties and fatigues of

professional or commercial life in the great metropolis, may be called Londonism, and with a peculiar difficulty in swallowing, from diminished nervous power and defective singular muscular action of the pharynx, made a tour through Antwerp, along the Rhine, the Berg-Strasse, the Schwarzwald, &c. At the commencement of the Berg-Strasse this patient discovered that his dysphagia had disappeared!

About the commencement of his throat affection he happened to meet the late Mr. Guthrie in consultation, and took that opportunity of mentioning his ailment, which Mr. Guthrie called "the clergyman's throat," advising him to desist from lecturing. In 1845 it became rather worse, and his general health was not good. He did not appear at all apprehensive, but, to satisfy me, he consulted the late Dr. Chambers and Sir Benjamin Brodie. On this occasion he wrote the following notes for the guidance of these medical friends:—

January 7th, 1846.

Seven years ago I gave a double course of lectures. From that time I have experienced a difficulty in swallowing, which has gradually augmented.

At first little morsels of solid food would remain in the pharynx after a meal. Fluids are now arrested there, and I am frequently disturbed in the night by accumulated saliva and mucus. These sometimes seem to overflow the rima glottidis, and to induce a fit of choking.

Recently I have experienced an occasional loss of voice. My voice becomes feeble and husky, especially if I attempt to speak loud.

The case seems to me to be pharyngitis passing into laryngitis.

It has gradually increased during six or seven years.

I have never had the slightest dyspnœa. I am sometimes obliged to keep my mouth closed in the night, and to cover

myself with the bed-clothes, to remove an acute sense of irritation on the border of the larynx.

I have occasional cough—to remove mucus or saliva from the *pharynx*. I have no *bronchitis*. On rising in the morning I am sometimes made almost sick by the irritation of the mucus in the fauces.

ADDITIONS.

The affection of my pharynx is much worse the last year; that of my larynx has come on within the year.

The questions appear to me to be—

Shall I at once quit London for a milder climate? or,

Shall I confine myself as much as possible, and especially in the evenings entirely, to my own drawing-room (which is warmed by an Arnott's stove), and refuse to go out late or at night?

What would be the probable consequence of further delay?

Is not my case that called the clergyman's throat? Do you know of any similar case of such long duration, and what were the consequences ultimately? Is there danger of thickening or of ulceration?* *I* have been in the habit of regarding my *pharyngeal* affection as a mere *incommodité* or infirmity. I do not know what to think of that of the *larynx*.

The following memoranda are on a separate paper, and appear to have been written as an assistance to his own memory, preparatory to the consultation which took place at Sir B. Brodie's house:—

Choking—rejection by the nostrils—sickness—pain across the chest.

Augmented by exposure to cold and by nervousness. Phlegm early in the morning, almost to sickness—deglutition of air—pharyngeal vomiting—*speaking loud.*

Sir Benjamin examined the larynx, and passed a probang into the stomach, no obstruction whatever

* How remarkable was the fulfilment of these fears and presentiments!

being encountered. After the consultation, Dr. Chambers, in the kindest manner, assured me that it was a nervous affection, and that there was no cause for apprehension.

The valerianate of zinc was prescribed, which did not appear to produce any good effect, and as it much disagreed with the stomach, it was, after a time, discontinued. Dr. Chambers and Sir B. Brodie did not think it necessary for my husband to leave London. He himself, however, entertained this idea, and we actually took measures to that effect. I find in a letter to a sister the following words:—"If Dr. —— were willing to take our house and furniture, it would be a great temptation to us to go abroad."*

In 1850, we removed from our residence at 14, Manchester Square, to 38, Grosvenor Street. He was much pleased with our new abode, which he playfully characterized as "the best house, in the best street, on the best side of that street, and in the best city in the world." The walls of his library were hung with his favourite engravings of the monuments of ancient Rome by Piranesi, which he contemplated with unceasing delight; as likewise the portraits of his valued friend Louis—the great Louis—Harvey, Hunter, &c. Sundry indications of impaired health and strength began, however, to manifest themselves. The affection of the throat remained much the same as for some years past; but he appeared fatigued by his practice, and spots of purpura made their appearance. Still

* I have been minute in giving the details respecting this lamentable affection of the throat, thinking that they would interest the medical reader.

there was nothing which peremptorily required his relinquishing his profession. It is not common for a man voluntarily to resign a very lucrative practice while he is able to continue it; most of our physicians are said to "die in harness." In 1852, we determined to quit London as soon as our house could be let, which for that purpose was placed on the books of the house-agents.

I will now quote his own words, first explaining that he at one time entertained the idea of annually spending three months of the season in London, for consultation—an intention which was afterwards frustrated.

Early in the year 1853 I found it necessary to leave London on account of health. I resolved to cross the Atlantic and join my son, who was making a visit to the United States, and I looked out for some young physician to take charge of my patients.

He was especially anxious that his investigations, and his plans and modes of treatment in nervous cases should be carried on after his departure; as he himself expressed it—"I was extremely anxious for the success of my successor, for science' sake, and that of the Spinal System specially." His interest in patients who had been long under his care never ceased but with life; and during his long absences from England, after quitting practice, he occasionally wrote to some of these, anxiously inquiring as to their progress in health. To Dr. J. R. Reynolds he confided his patients, and to this gentleman, who had taken much interest in his investigations and had manifested supe-

rior ability, Dr. Hall, with his accustomed energy and untiring zeal, amply communicated his scientific views and his modes of treatment. The following particulars were dictated from his bed of sickness, shortly before his death:—

The result of all this was, a thousand conjectures and reports; one of these being, that I had sold my practice—that I had sold it for 7000*l.*!! The truth is, that Dr. Reynolds took the lease of my house, repaid me 400*l.* which I had paid for fixtures,* 600*l.* for my furniture, and 100*l.* for a grand piano. No farthing beyond this did I ever receive.

At this period he addressed the following affecting letter to our son, then travelling in the United States:—

38, Grosvenor Street, Dec. 26th, 1852.

My dear Boy—It is formally arranged that we leave Grosvenor Street on Feb. 1st. It is not too soon. On the 18th of that month I complete my grand climacteric—7 × 9 = 63, and I have sundry intimations that my health is not of the most stable: my liver is tender and enlarged, my ankles disposed to swell and to have purple spots, &c. I have, however, *One* faithful creature, the comfort and blessing of my remaining days. I have also the full assurance of an eternal glory when my spirit and my soul are called away; for I have not *permitted* sin, and my sins and frailty are daily washed away in that "Fountain for sin and uncleanness," the blood of Christ.

May you, my dear boy, live to attain my age, amidst some useful and worthy career, and be thus equally blessed. . . . .

It is singular enough that I have just arranged to leave practice, when I *feel* that my worldly work is done: I have finished all that was required to complete my Nervous System —Experiment, Physiology, and Pathology. The paper enclosed is the one of which I am most proud.† I have earned

* To the Right Hon. Lord Panmure, the previous tenant of the house.

† His "Table of Epilepsy," &c.

a degree of reputation and of fortune that ought to satisfy me . . . —&c. &c., MARSHALL HALL.

My husband's thoughts had recently been strongly fixed upon the subject of slavery and the condition of the negroes in the United States. He had read with extreme interest "La Démocratie des États Unis," by De Tocqueville; whilst "Marie, ou l'Esclavage," by Gustave de Beaumont, had presented him with a striking picture of the deplorable prejudice which exists in that country against the coloured race. It was natural that one with Marshall Hall's utter detestation of all injustice and oppression should feel strongly on such a subject, and he determined to study it for himself.

Our feelings on leaving London were a mixture of pain and pleasure. My husband was indeed quitting the toils of practice; but many a pang was experienced in saying farewell to beloved friends, whose warm expressions of attachment, drawn forth by the occasion, were deeply appreciated by us. The heartfelt pleasure of joining our son, however, prevailed over every other feeling.

CHAPTER XIV.

TOUR IN AMERICA.

On the 12th of February, 1853, we embarked at Liverpool on board the Cunard steamship "Arabia," Captain Judkins, for New York. The weather was fine and frosty at the commencement of our passage, and we did not at first suffer from sea-sickness. Actively pacing the deck, occasionally entering into conversation with his fellow-passengers, eliciting information from all, and observing every object and occurrence with lively interest, my dear husband was in excellent spirits, and greatly enjoyed the voyage.

With most people a sea-passage is a thoroughly idle time; but it was not so with him. He sought out those passengers who could afford him the most information respecting the new and vast regions we were about to explore, and when not engaged either in conversation or in walking the deck, his pencil was recording the thoughts of his ever-active mind.

When we had been at sea about a week we encountered a terrific gale. The captain said he had "never beheld a worse sea," calling it "a wicked sea." The waves threatened to sweep everything off the deck; for which reason it was judged necessary to

put the ship's head to the wind. During this tremendous gale and hurricane, my husband suffered much from sickness; with the return of health, however, his writing was resumed. There were many Americans on board, and it was whispered amongst them, "Dr. Hall is taking notes already!" It is well known that the remarks of English travellers have not always been satisfactory to our Transatlantic friends; they therefore look suspiciously at an Englishman writing. My husband observed this, and said, "Should you like to see what I have written?" "Very much indeed," was the eager reply. He immediately gave them his manuscript, and on reading its title, "Sur la Physiologie du Mal-de-Mer," their suspicions were at once dispelled! During the forty-eight hours that he had been suffering from sea-sickness, he had been intently studying, from his own experience, the physiology of that malady, the results of which he embodied in a paper for the *Comptes Rendus* of the Institute of France. Written on the wide Atlantic, the paper was soon after despatched from Washington to Paris, and immediately published in the above scientific records.

We always, when possible, were on deck at noon to witness the daily "observation, and the heaving of the log," and we duly noted the ship's speed, the alteration of the clock, &c. In all these operations my husband took great interest, and nothing escaped his acute observation. I quote the following from his memorandum book:—

Seeing a thermometer behind the helm, I asked the use of

it. It is used to take the temperature of the sea, and to detect, by the alteration of temperature, the nearing of "soundings" or land, the proximity of icebergs, and the entrance into the Gulf Stream.—*Feb. 18th.* Early this morning we observed a lengthened cloud hanging over the distant horizon, about N.E. and W., said to be over the bank of Newfoundland. The sea is there perhaps 10° lower [in temperature], and the superjacent air deposits its moisture in the form of fog or cloud, as on the tops of the Swiss mountains.

The day before reaching port, as is usual, upon voyages of any length, "the captain's dinner" took place, followed by toasts and speeches, and my husband was deputed to propose the health of Captain Judkins.

He ever retained pleasurable recollections of this voyage, which terminated in our safe arrival at New York on February 23rd. I proceed to quote some passages from a little work* which he wrote after his return to England:—

The inauguration of Mr. Pierce as the President of the United States, was appointed for the 4th of March; we therefore speedily proceeded to Washington. We were much pleased with the simple pageantry of the inauguration, and gratified to see the many truly great men of the different States whom the occasion had assembled together. Here I first became familiar with the sable countenances of our fellow-men and brethren of the African race.

His warm sympathies were excited in behalf of the Negro, both in his enslaved and in his so-called free state.

In a letter to Dr. Webster, of Dulwich, written from Washington, he says, in regard to—

* "The Twofold Slavery of the United States, with a Project of Self-Emancipation."

The great question of the poor Negro, I feel somewhat as if I could spend the little remainder of my life in its advocacy.

Henceforth, during our whole tour of fifteen months in the United States, Canada, and Cuba, he never ceased intently to pursue this subject. With that unwearied zeal and remarkable acumen which he brought to bear upon every investigation on which he entered, he daily, I may say hourly, accumulated facts from personal observation, from statistics, and from every available source of information, and it was not long before a plan occurred to his suggestive mind, by which he believed that the slave might be emancipated, with the most beneficial results, not only to the latter, but also to the white population.

While at Washington he delivered a lecture, by particular request, at the Smithsonian Institute; its subject was "Zoonomia, or the Laws of Life." It will be recollected that this investigation had occupied him in 1831.

At this city, the crowded hotel, containing nearly a thousand guests, some of these being interesting and intelligent, others, from the remote Western States and territories, somewhat grotesque; the innumerable "place-hunters," the varieties of dress, manners, &c., presented much of novelty to us. My husband was greatly sought after, and it was said by one highly capable of appreciating him,* "Dr. Hall is a most interesting person."

Our next stay was at Baltimore. Here we were

* The late Mr. Everett.

charmed with the society, and were received more as old friends than as strangers. The greatest attention and kindness were shown to my husband by the medical profession.

At Baltimore we became acquainted with some members of that family from which Jérome Bonaparte chose his youthful wife;* three other ladies of the same family, though of another branch—the Misses Caton —married British Peers, and all were distinguished for the fascination of their manners. The aged Mrs. Harpur had seen much of the Duke of Wellington in her youth, and she spoke of his extreme politeness and consideration towards ladies.

In the *salons* at Baltimore the ladies often formed a circle around me, begging me "to tell them something about Queen Victoria," and I had the pleasure of relating some well-authenticated anecdotes, illustrative of the rare excellence of our virtuous Sovereign, to which they listened with intense interest.

At this city my husband derived extreme pleasure and much information from the conversation of Mr. Latrobe, the talented Secretary of the Liberian Colonization Society.

To a friend in England he wrote :—

I have been greeted in an extraordinary manner by the M.D.'s of Baltimore, and have twice addressed the students. The people are kind and hospitable in the highest degree; all are striving to make our visit agreeable in the way we point out.

To another he says:—

* This year so flagrantly insulted by a late judicial decision in France.

I am fêted here. I intended to stay *five* days at Baltimore, and have been compelled to stay twenty-one !

Everything is extraordinary for *progress*.

What should you say if we returned through China and Palestine ?*

We found the name of Marshall Hall very familiar to the medical profession in the United States, his works being highly esteemed and extensively read by them. Some of these indeed have been reprinted there, and have even reached several editions.

The following is an extract from my own journal :—

Philadelphia, April 18th.—We have now been here a fortnight, and have become acquainted with all the principal physicians of the place. They have been *most kind* and *attentive*, and we find them a very agreeable, intelligent, gentlemanly set of men. They appear united and amiable among themselves. Neither here nor at Baltimore has my husband ever heard one speaking disparagingly of another ; on the contrary, a spirit of unanimity seems to pervade the *corps médical*. He is greeted most cordially, and honour is paid him in every way. He has been requested by several medical schools to give lectures, and on the 16th of April he delivered one at the *Pennsylvania Hospital*. His numerous audience were the most attentive he ever met with ; during the whole hour of his lecture, no one stirred—the most profound stillness and attention prevailed.

On referring to my journal I find the following project :—"Bishop Boone has almost persuaded us to go home by the way of China. We might proceed from New Orleans next winter, across Panama to San Francisco in California ; thence by a clipper to Canton, where we should fall in with English vessels, and, taking a peep at India, proceed by the Overland line of steamers to Egypt, visit Palestine, Greece, &c., and then return home. But perhaps these are only *châteaux en Espagne*."

I continue our route from my husband's brief account:—

From Philadelphia we passed along the railroad which conveyed us over inclined planes across the Alleghanies to Pittsburgh. Here we witnessed the confluence of the Monongahela and Alleghany rivers, and the formation, by their conjunction, of the Ohio, truly the "beautiful river," as its Indian name implies, on whose waters we were to pass so many enjoyable and instructive hours, between banks of wood and verdure, and bright with the red and white flowers of the redbud and the dogwood. Along its course we passed between the Free States of Ohio, Indiana, and Illinois on the north, and the Slave States of Virginia and Kentucky on the south, stopping at Cincinnati in the first, and at Louisville in the last of these.

This river passage from Pittsburgh to Cincinnati, about 500 miles, which we performed in two days and nights, was greatly enjoyed by my husband, who often reverted to the pretty banks of the Ohio with pleasure. His health was now improved, though at Baltimore he had suffered from a carbuncle on the arm. We were constantly on the "guards" or on the "hurricane deck" of the steamer, enjoying the air and the scenery without fatigue.

No sooner were we arrived at Cincinnati than a crowd of kind visitors presented themselves and offered their services to drive us out and show us the city and its beautiful environs. My journal states:—

I can only say that nothing could exceed the attentions we received. Medical gentlemen innumerable called on my husband, and he was requested to lecture, which he did three times, exciting deep interest. Mr. R—— said to me yesterday, "The profession here are perfectly delighted with Dr. Hall's *accessibility* and warm-heartedness, and his frank,

simple manners." We quit Cincinnati with very pleasant impressions, and shall ever retain a grateful recollection of its kind inhabitants.

Long after our visit to this city, my husband received a letter from Mr. R——, containing the following expressions :—" You do not feel to us as strangers, and go where you will, and do what you may, you never will."

One day's steaming down the Ohio brought us to Louisville, in Kentucky, and thus we were once more in the Slave States. Here the same kind reception awaited us. The physicians begged for a lecture, which is alluded to in the following extract from a letter addressed to Dr. Lawson, of Cincinnati :—

I lectured from a frog and a snake at Louisville, as I did from my patients at Cincinnati. This is precisely what I like to do. Facts, with a word or two of commentary, leave an impression of truth on the mind which is at once clear and enduring.

I always think of the kindness of my friends at Cincinnati with gratitude, and shall never forget it. Pray tell them so ; and do you, dear Dr. Lawson, think of me as your very attached friend, MARSHALL HALL.

During our stay at Louisville, a week was devoted to visiting the Mammoth Cave. Hiring a carriage with a black driver, we occupied three days in reaching this most extraordinary of all known caverns. The usual exploration of these subterranean regions requires at least fourteen hours of hard walking, climbing, and creeping ;* but we contented ourselves with such a partial acquaintance with their wonders as

* One of the narrow passages is appropriately called " Fat-man's Misery."

could be obtained in four hours; our son, however, penetrated ten miles into the labyrinth, this being by no means its limit. I must not here attempt to describe, if indeed that were possible, this endless series of vast and diversified caverns, subterranean rocks, rivers, and every variety of scenery, in regions where no ray of daylight can penetrate.* The cave is situated in the midst of a forest, where my husband was delighted to ramble amidst the noble trees and the exuberance of vegetation, the lovely "red-bird" of Kentucky winging its flight over our heads, and the "whip-poor-Will" singing his curious song, whilst under our feet he watched the extraordinary habits of a beetle, here called "the tumble-bug," thus described by my son:—

These animals work in pairs, laying their eggs in a little ball of dung one-half to three-quarters of an inch in diameter, which they finish off most artistically. These they roll many yards to their abodes, indicated by an opening in the ground of just sufficient size to receive the object of their care. The mode of progression is amusing, nay laughable. One "bug" devotes its energies to constantly climbing up one side of the sphere, which as constantly rolls down with it, whilst the other beetle, with equal assiduity, helps its partner by turning its tail to the ball on the opposite side, and *shoving* it at the judicious instant with the hind legs.

In a remote place, where we stopped to rest the horses, my husband fell into conversation with a backwoods doctor, who, without knowing his name, in-

The Bloomer costume is necessarily adopted here by ladies, as at the salt mines of Hallein. I may mention that the caverns at Hans, in Belgium, are diminutive, in comparison of the Mammoth Cave.

sisted on taking him to his house to see some fossil remains recently discovered in the neighbourhood. On the bookshelves of this gentleman, Dr. Geoghegan, were the American editions of "Marshall Hall's Observations on Bloodletting," and his work on "Diagnosis." The rudeness and roughness of this journey through Kentucky, and its many discomforts, were compensated by its novelty and interest.* We went and returned by different routes, part of which lay through interminable forests of giant growth. Here we became acquainted with innumerable trees, new to us, and with the almost endless varieties of the oak which are indigenous to that country. As night approached, the firefly (here called the "lightning-bug!") lit up the twilight like myriads of bright stars dancing among the dark green foliage.

During our journey we encountered one of those tremendous storms, happily almost unknown in our own latitude.† A hurricane swept the country for a certain distance. Had we come within its radius, our carriage must inevitably have been blown over. Pro-

* Did space permit, I would tell of our miseries, on various occasions. At a house with the unpromising name of "Bear Wallow," the black maid was astonished at our requiring the superfluous luxury of upper sheets on the beds! The vermin were everywhere intolerable, and precluded rest at night. At one place a Negro mother comforted her infant by the assurance that "the white man should not look at it."

† Curiously, however, on the last day of 1859 a tornado of not more than three or four hundred yards in breadth, swept through the property of my son at Blacklands, in Wiltshire, blowing over and snapping 148 trees in the park, some of them of noble dimensions and great age, and shaking many others, so that they had to be felled. It lasted only two minutes or thereabouts, unroofed and otherwise injured many buildings, and is recorded as "the great Wiltshire storm."

videntially we were just outside its range; but even thus the storm was frightful. As we proceeded we saw the devastation produced by this tornado. Giants of the forest, the growth of centuries, were snapped off, torn up by the roots, or twisted round by the whirlwind.

A medical friend occasionally drove my husband to see some of the most remarkable of the beautiful trees in the vicinity of Louisville, and he was so charmed with them, particularly as they were then in full bloom, it being the month of May, that, through the kindness of a friend, he afterwards collected various seeds, from which plants have been raised. One of these, a young locust tree, is at present thriving at Blacklands Park, in Wiltshire, thousands of miles from the parent tree. It may well be imagined that we regard these plants with peculiar interest.

Great as was the pleasure with which my husband examined everything in the natural world, as well as the intellectual, the emancipation of the Negro held the predominant place in his thoughts and feelings.

This might indeed have been expected from one of such warm sympathies. He was, however, fully alive to the difficulties which beset the question, and was neither unreasonable nor unjust towards the slave-holder. It was about this time that, after much inquiry and thought, a plan occurred to him by which he conceived that slavery might *very gradually*, and after *due preparation by education*, be safely abolished. It was a plan for SELF-emancipation, and was the germ of the little work which he wrote, after mature con-

sideration of the facts, and to which I have already alluded.* His first ideas were published in a series of communications inserted in the *Louisville Journal.* It was an instance of great liberality in the editor, Mr. Prentice, to admit these in the journal of a Slave State. The subjoined are some extracts from the editorial remarks which accompanied them :—

The following communication is from a distinguished English physician, whose medical writings are better known and more highly esteemed in this country than those of any other physician in Europe. Whatever may be thought of the writer's plan [of self-emancipation], his remarks will be read in a kindly spirit, for they are at least the suggestions of an intellectual man and a philanthropist, who is very far from entertaining against slaveholders the prejudices so common among his countrymen.

Leaving Louisville, we once more steamed a few hundred miles down the Ohio, till we reached its junction with the "Father of Waters," the wonderful Mississippi, the ascent of which we now commenced; the danger from that frequent catastrophe of "blowing up" being added to the no less terrible liability to death from "snags." In ascending the river, these not unfrequently perforate the steamer, which, immediately filling with water, sinks with such rapidity as seldom to afford the time to escape. A passage of three days brought us to St. Louis, Missouri. The following is a short extract from my journal at that place :—

The physicians came to pay their early respects to my hus-

* A sketch of this plan will be found in a subsequent portion of this volume.

band, as soon as they heard of his arrival. Here, as everywhere, his fame had preceded him by many years. He has attended the Medical Society of the city, where he spoke during fifty minutes, amidst the moost profound attention. He was then unanimously voted an honorary member of the Society. He is regarded with a perfect enthusiasm by the profession at St. Louis; they scarcely know how to express their delight at seeing a man whom as an author they have long known so well and appreciated so highly.

While at this city he addressed a letter to Dr. J. R. Reynolds, in London, from which I make the following extracts:—

I have been greatly engaged in making frogs and patients *lecture!* And I find this mode of proceeding *the* most satisfactory of all. All can appreciate the *facts* as they are brought out before them, and I leave my auditory without a doubt, I believe; and with their views, obtained chiefly from the works of —— and ——, much corrected.

But the chief thing which has occupied me has been the all-absorbing *slave*-question. I could devote the rest of my life to effect emancipation, if possible, for slavery is a dire wrong and crime; and I think I have devised a plan which may have a better success than any hitherto suggested. I will send you something on the subject shortly. I have carefully gathered facts from a thousand sources, opposed in themselves. The result is most interesting. Slavery is the dark spot on America; and the want of the indissoluble marriage bond is the dark spot on slavery. But, more, as I have said, hereafter, on this to me growing and engrossing subject.

We still have dreams of visiting California, and of eventually pursuing our route homeward by China and the Holy Land. On my way I hope to repeat my experiments on larger insects than Europe affords, and on the alligator, &c. But, besides this and the slavery question, I am constantly engaged in tracing the types and anti-types of Christ and His sal-

vation. Indeed I was never, mentally, so busy. — &c., MARSHALL HALL.

Leaving our many kind friends at St. Louis, we continued our ascent of the Mississippi for several hundred miles, between the noble bluffs, or river-cliffs, to St. Paul's, in the territory of Minnesota. Hence we made an excursion to see the encampment, on the shores of Lake Amelia, of an expedition about to start for the exploration of the Rocky Mountains, with a view to the construction of a railway to California. My journal says :—

On arriving at the encampment, my husband inquired whether there were any medical officer, upon which he was conducted to the tent of Dr. Sukeley, to whom he presented his card. Never shall I forget the amazement of the latter, on reading the name of Marshall Hall. He lifted up his hands in utter astonishment to see the author of works so well and so long known to him, in this remote place. His pleasure seemed to equal his surprise. He introduced us to Colonel Stevens, the commanding officer of the expedition; a little man, with a quick eye and step, who is very highly esteemed. Dr. Sukeley insisted on conducting us across a prairie to see the beautiful little fall of Minnehaha, or "Laughing Waters." The soldiers were breaking in wild mules, some of which, Dr. Sukeley apprehended, would be wanted as food before their return !

Beyond the new small towns of St. Paul and St. Anthony, at which we stayed, none exist westward in this part of the United States, or, rather, territories, until, after traversing several thousand miles of wild Indian country, and crossing the Rocky Mountains, California is reached. Whilst in the interesting ter-

ritory of Minnesota, we made excursions amongst the Sioux and Winnebago Indians, and, at the kind invitation of the Governor, accompanied him far north-west to Sauk Rapids, to witness the extraordinary scene of a council meeting of the chiefs of the three tribes of the Chippewas, Winnebagoes, and Sioux, attended by 250 of their people, in order to discuss certain "difficulties," some of these difficulties being *scalping* affairs!

On every such previous occasion, the Governor had been accompanied by a military escort. But Governor Gorman, who had just been appointed, boldly informed the Indians, in a meeting at which we were present, that he should go without any escort, adding, through the interpreter, "I am a soldier, and want no one to guard me. My revolver and my bowie-knife will be my only protection." On our passage up the Mississippi to Sauk Rapids, about eighty miles beyond any habitations, except here and there a log hut, we encountered a tornado, and for a few minutes our little steamer was in great peril. The council meeting was a wild and exciting scene; its description would, however, be too long for my present purpose.

All this was intensely interesting to my husband, and he bore the fatigue, the heat, the mosquitoes, and the bad diet wonderfully well. His purpura had already disappeared.

Our various excursions among the Indians were full of adventure and interest. On one occasion we were paddled by a squaw in a canoe across the broad

Mississippi, to visit an encampment of 1600 Winnebagoes in wigwams.

Returning down the Mississippi, from St. Paul to Galena, we there took a carriage and crossed the prairies, bounded by a sea-like horizon, on the northern border of Illinois. Part of our way was through sloughs, and part over "corduroy" roads, which my son describes as

Consisting of small trees laid close together transversely on the road (!), with the bark on (! !), as they had been felled (! ! !), and without the slightest attempt to square their upper surfaces ! ! ! ! Our bumpings and joltings on this rude kind of road baffle all description. A railroad has, I believe, now superseded this excruciating and dislocating mode of travelling.

Our next place of rest was Chicago, on the south-west shore of Lake Michigan. Here we experienced a repetition of kindness and hospitality, such as I have alluded to on former occasions, and my husband gave a lecture to the Medical Society of the city, great interest being manifested in his peculiar researches.

Quitting Chicago, we commenced the navigation of those great inland seas, the Lakes Michigan, Huron, and Erie, of such disastrous notoriety, and after a passage of five days, landed at Buffalo, proceeding immediately to Niagara, and then crossing the ferry just below the Falls, to Clifton House. During the voyage over the lakes my husband wrote,—

The narrow water which divides the State of Michigan from the village of Amherstberg in Canada—that narrow water, so often crossed with a palpitating heart by the poor fugitive slave—had the most intense interest for us.

During our pleasant sojourn at Clifton House, the large hotel on the Canadian side of the Niagara River, and close to the Falls, he wrote the following:—

BRILLIANT SCENES—NIAGARA.

Of all the scenes my eyes have beheld, that of Mont Blanc from La Faucille, on the summit of the Jura, with its intervening Alps, the lake and the city Geneva, and the adjacent valley and its mountains, is the most supremely grand and beautiful. Next to this I rank, from the impression it made on me, the first view of the Glacier of Argentière, on the approach to Chamouny by the Tête-Noire. But what *can* exceed the other views from and about that spot of snowy and icy wonders? In the third place I must rank Vesuvius. After these comes the glorious scene before me—the Falls of Niagara! "The Thunder of Waters," according to the poetical language of the Indian.

The Crescent, or Horseshoe Fall, in beauty of form, of its emerald colour, and of its massive waters, crowned by the tossing and foaming rapids, and hidden in its depth by its cloud of foam, is infinitely the most grand and magnificent. But the American Fall exceeds it in its filmy and lace-like beauty, thrown out at different points into exquisite festoons, and, whilst equally crowned by beautiful rapids, falls and is distributed into fairy streamlets by the rocks below.

The whole scene is in harmony: the rocky cliffs, their wooded summits, the scattered cottages, the village of Niagara Falls, the fearful rocks below, all combine to form one splendid scene of sublimity and beauty.

And this is the first spot in Canada on which we set foot. Oh, holy Canada, thy soil at least no foot of the slave *can* touch, for that touch is freedom! Oh! who can imagine the effect of that first touch on the feelings of the hitherto crouching Negro, whose fault is not, as his calumniators would say, in his want of heart and soul, but in not being of the colour of him to whom he has been bent in horrid and cruel slavery. Imagine that exulting cry when his career of danger

is thus finally crowned—"And now I, too, am free!"—with all its ecstasy of victory and bliss.

But to return from this digression. The spray from the waters, as they strike the rocky bed of the river, rises first like a thick cloud, and then much higher in an almost transparent form. When at length lost to the sight, its existence is still revealed by an almost vertical rainbow, as the setting sun approaches the horizon.

Here I could live and gaze on these beauteous waters, far from "envy, hatred, and malice." Here I first resolved, having nearly drawn to a close my observations on hideous slavery, to write this *coup d'œil* of the United States.

July 4th.—This morning, whilst the people on the other side are preparing to commemorate the "Declaration of Independence," we seek the shade of trees and go in search of new points of view of these beauteous Falls, not without a thought of another emancipation which would be, at the least as glorious, and less selfish, than that of 1776.

And here I may remark that the persons of colour collected at this spot to be useful to its visitors, many of whom are fugitives from slavery, and therefore good specimens of what the bond-slave is, are persons of the mildest and gentlest demeanour, and I cannot but wonder how such persons can become the objects of antipathy to any one. The more I see of this persecuted race, the more do I sympathize with them. Not robbed, but stolen, how sad has been their wretched fate! Who would remain partaker, even in the least, in the horrid crime?

But I again return to Niagara. There are several delicious walks around these Falls. A beautiful row of trees extends from the western point in the arc of a circle to the south, in the shade of which we walked, having at each point distinct views of the Rapids and the Falls, and lulled by their constant murmurs, or rather, perhaps, I ought to say, their distant roar. It was, by association with its cause, perfect music, and we shall not, whilst life endures, forget its soothing influence.

At the southern point of our circle we arrive at the commencement of the Horseshoe Fall. The rapids above the Fall itself, the mass of the waters, their division by the jutting rocks, the streamlets below, the dash, the foam, the spray, the cloud with its bow of every colour, all combined to present a picture unique of its kind, and of passing beauty.

Most truly did my beloved husband say, "We shall not, while life endures, forget its soothing influence!" We daily strolled over the spots he has so feelingly described, at every fresh point of view stopping to luxuriate in the charm of the scene. High on the cliff, there was one nook, in particular, where we were wont to sit among the bushes and gaze untiringly on the wondrous waters beneath. We named it "Cedar Point," for there the cedar seemed to delight to grow abundantly. It is probable that on that very spot—for ever hallowed in my memory—he wrote the pencilled lines which I have just quoted.

The charming repose afforded by our stay at Clifton House was greatly needed. During the preceding half year we had gone through much fatigue in travelling—frequently over roads of almost incredible roughness; and our visits to the cities, though agreeable and gratifying in the highest degree, had been attended with constant excitement and exhaustion; added to this, the heat had been intense. My husband had borne all this demand upon his strength wonderfully; but my health had begun to suffer. The necessity for rest and quiet caused us to hasten to the Falls, and so to pass through Buffalo without stopping.

As soon as the medical profession at the latter place became aware that my husband was within twenty-five miles of them, a letter was addressed to him by the President of the Medical Society, requesting him "to honour them with a visit." Fearing that we might have left before the receipt of the letter, it was immediately followed by a telegram, and also by the visit of a physician despatched by the Society for the same purpose. Accordingly a day was fixed for the visit to Buffalo. I was included in the friendly invitation, which I declined solely on account of health. On the day appointed, Drs. Hamilton and Strong actually came to Clifton House, to escort their guest; and Mrs. Hamilton, with the most friendly courtesy, accompanied them, in the hope of prevailing on me to join the party. It is scarcely necessary to add that such extreme kindness was irresistible, and we all, including my son, crossed the river and took the railway cars for Buffalo. On our arrival we were met by the President of the Medical Society in a charming carriage, which we were requested to consider as our own during our stay. At the principal hotel we found elegant apartments provided for us, and a sumptuous dinner. In the evening my husband delivered a lecture on his discoveries in the Nervous System before the assembled profession and some other distinguished auditors, one of these being Mr. Fillmore, ex-President of the United States. The lecture was followed by a most agreeable soirée, and after spending the next day in the pleasantest manner possible, we returned to our retirement near the Falls, highly

delighted with the friendly hospitality and agreeable society of our friends at Buffalo. We were not allowed to pay any of the expenses of our trip, being generously considered as the guests of the Medical Society.

Quitting Niagara, my husband wrote the following:—

Having satiated our eyes with the tossed and foaming rapids, the mass of sea-green water moving to the edge of the precipice, the majesty and beauty of its Falls, and listened with awe and delight to their sublime thunder, I left Niagara and obeyed a professional summons to proceed to Hamilton, and thence took the steamer on Lake Ontario for Toronto, where my wife and son joined me. Here I was deeply interested in the noble designs and deeds of the Anti-Slavery Society, and especially in the active part which the *ladies* take in the good work of succour to the most persecuted of the human race. How noble is the effort here made to provide safe shelter for the poor fugitive!

No sooner was our arrival at Toronto known than a meeting of the medical profession was held, at which the following resolution was unanimously carried:—

Resolved—That a deputation from this meeting be requested to wait upon Dr. Marshall Hall, to beg that he will do his professional friends and admirers in this city the honour of accepting an invitation to a public dinner,* at any date most convenient to himself.—Signed, &c., &c.

The following was the reply:—

July 19th, 1853.

Gentlemen—I have no words to express my thanks and

* The Mayor of the city also called on this occasion, expressing a wish that the dinner should not be confined to the medical profession.

gratitude for your kind invitation, which I cheerfully accept on the condition that you kindly substitute for the words "public dinner," those of "a private soirée," and permit me to appoint this evening for our meeting.

Allow me to add that I shall never forget the tribute you pay, in your invitation, to my efforts for six-and-thirty years in the cause of Medical Science.

May I, in return, propose to you the formation of a Medical Association amongst yourselves, to be called (in order to denote its scientific character, and in remembrance of a great name) THE HARVEIAN SOCIETY OF TORONTO, to meet at each other's houses fortnightly, for reading Medical Reports and Papers, discussing medical topics, enjoying a friendly cup of coffee, and arranging the circulation amongst you of medical works, the objects being the promotion of kindly feelings and the diffusion of medical knowledge?—I have the honour, &c., MARSHALL HALL.

My husband's simple, unostentatious character made him always shrink from a public dinner and speeches. The suggested change was of course adopted, and at the soirée he explained his discoveries in the Nervous System. But the speeches were not to be thus put aside—for the liberality of the entertainers had provided a supper; and good fare and champagne are great incentives to speeches. The Mayor and the Attorney General were among the company. The latter, in terms highly complimentary to the guest of the evening, said, "he had never, in his whole life, heard any one explain a subject with such admirable perspicuity, yet so concisely, as Dr. Marshall Hall that evening, in stating his views on the Nervous S---t-m."

:er receiving much kind attention at Toronto,

we steamed along Lake Ontario, and steering our way among the beautiful little "thousand islands," descended the St. Lawrence, passing over its fearful "Rapids," and arrived at Montreal. Promising to return to this city, we thence proceeded to Quebec, with the citadel surmounting its most beautiful heights.

I now quote my husband's notes :—

Leaving Quebec in its turn, we passed still further down the St. Lawrence, in view of the splendid Falls of Montmorency, and ascended the Saguenay River. As we approached, entered, and ascended the latter, we perceived numerous porpoises, rising for a minute above the surface of the water, and displaying their *snow-white* forms. These porpoises are caught for the oil they supply. We saw one at a short distance, which some men in a boat had speared (probably); as it moved to a distance from the boat and rose out of the water, we perceived the rope by which it was held safe.

As we ascended the Saguenay, we saw, chiefly on the left, many mountains covered with forests on fire. The smoke ascended, or was carried by the winds, in greater or less volumes, and once covered the river.†

As we returned, night having come on, and the same phenomenon continuing, the mountains frequently appeared in flames, reminding us of Vesuvius, when we visited Naples in 1845.

Proceeding up the St. Lawrence, back to Quebec, another sight, novel to us, presented itself, that of a whale disporting itself in the river!

Dr. Gibb informs me that the white porpoise is peculiar to the Gulf of St. Lawrence, and is commonly seen at the mouth of the Saguenay, not being met with in any other part of the world.—C. H.

† The frowning grandeur of the precipices which hem in the powerful flood of this river, bears somewhat of the character of the Fjords of Norway.—C. H.

At Quebec we were warmly greeted, and the medical profession speedily commenced arrangements for giving my husband a dinner at the Town-hall; he begged, however, for the substitution of a soirée, which accordingly took place in a magnificent style. He here delivered a lecture upon his discoveries in the Nervous System. Lord and Lady Elgin, the former being then Governor-General of Canada, invited us to a *déjeúner* at Spencer Wood, but having already fixed to go to Montreal, we were obliged to decline it; though our son remained and enjoyed the gaieties of the occasion.

Montreal was as friendly as the kindred cities of Canada, in its reception of my husband. A public dinner was proposed, but, as in the other instances, a *conversazione* was preferred and adopted. The following is quoted from the September number of the *Montreal Medical Chronicle*, except the latter portion, which is from the *American Lancet*, as containing the more brief account.

DR. MARSHALL HALL AT MONTREAL.

This distinguished physician, who has during the last six months visited many of the cities of the American Union, arrived in this city on the 11th ultimo, and left it again on the 17th.

During his residence here, all the leading practitioners of the place, and a few from the vicinity, called upon him, and were much pleased with his urbanity of manner, easy address, and readiness to communicate on subjects which have engaged his attention during a long and active life. On the evening of the 15th, he performed a number of experiments, which will be published in our October number, in the rooms of the Natural History Society, before a

highly respectable audience; and, on the succeeding evening, delivered a lecture* at a *conversazione* held in the same rooms.

At the close of the lecture, the President of the Society, Major Lachlan, presented Dr. Hall with the Diploma of Honorary Member of the Society. Now, the mere fact of the presentation of the Diploma may not be considered as of much value in itself; but it was in the manner in which the degree was conferred that honour is reflected upon Dr. Hall and the Society. This distinction was bestowed by acclamation at the preceding meeting in an unusual manner, the customary form of previous notification having been dispensed with in honour of the distinguished Physician and Physiologist. Dr. Hall replied to the President in a few words, happy in expression, full of meaning, and, like all that he says and does, to the point.

Quitting Canada on the 17th of August, we passed along Lakes Champlain and George, making a short stay at the latter, and then proceeded to Saratoga. At this gayest of all gay watering-places, there was little which was congenial to my husband's taste. He disliked nothing so much as the idleness and frivolity of a watering-place; therefore, after being lionized and "presented" to sundry notabilities in the gay world, we hurried away to Albany. At this capital of the State of New York we experienced the genuine hospitality of one of those agreeable families, descended from the original Dutch settlers, who are ranked amongst "the first people" in American society. The country-house and grounds of General Van Rensselaer, with all the comfortable

domestic arrangements, reminded us of our own country.

At Albany commences the navigation of the noble Hudson River, which we now descended to New York, staying a few days by the way at West Point. The stifling heat caused us soon to hurry to Newpor*

We r _ l a visit of some days at Captain Delano's, at New Bedford, whose family and house presented a charming specimen of New England private life. And here I cannot resist transcribing a paragraph from my journal :—

> We feel that we have no warmer friends in America than Dr. Bartlett, of New Bedford, and Captain and Mrs. Delano. They are grateful for the little attentions we paid them long ago in England. Mrs. Delano, who received me with the warmest affection, says she always felt, in visiting us, as if coming to a brother and sister. They overrate our kindness, and repay it with interest.†

On the 17th of September we arrived at Boston. I must not enter into the details of the many interesting persons and objects which render a visit at this Transatlantic Athens so agreeable; but I cannot omit to mention the great attention we received. My husband here gave a Demonstration and a Lecture on the Spinal System. He was deeply interested in a visit which we paid to Laura Bridgman, the blind, deaf,

* This renowned sea-bathing place much disappointed us. It affords no view of the sea, and is at an inconvenient distance from it.

† After living for upwards of six months in hotels, it was refreshing to enjoy all the comforts of a well-arranged private house.

and dumb girl, whose education has been effected in so extraordinary a manner by Dr. Howe.

In our journey hence to New York, the brilliant tints of the autumnal foliage were splendid.

The medical profession at the latter city greeted Dr. Hall cordially, and very soon enlisted him for some lectures, of which he delivered two at the College of Physicians; I extract the following account of them from a New York Journal.

Dr. Marshall Hall and his Lecture on the Nervous System.

The profession are enjoying the rare opportunity of listening to a brief series of lectures from the world-renowned Marshall Hall, of London, on his speciality, the Nervous System.

It was not publicly announced, but long before seven o'clock last evening the Anatomical Theatre of the College of Physicians and Surgeons, in Crosby Street, was overflowing with medical men.

At half-past seven o'clock, the appointed hour for opening, the gangways, halls, and lobbies of the theatre were densely crowded, and before eight o'clock probably 150 persons had gone home unable to obtain even standing room. As to the number present, we can give no definite account. It would be safe, however, to put it at about fifty more than the room is generally admitted to hold. It would have done a sick man good to see the crowds of magnates in the profession who sat all alive with interest and utterly absorbed in the interesting expositions of the lecturer. The Professors of the Schools, the lords of the scalpel, the Æsculapiuses of our city, the venerable white-haired authorities, and the ambitious, studious aspirants for medical fame, seldom turn out as generally as they did on this occasion. The occasion was an extraordinary one. There are few greater names in

medicine than that of Marshall Hall. His fame was established in his youth; it matured with his manhood; and, in his age, he is pushing vigorously on for greener laurels. His "Diagnosis" is a work still in high esteem, which is sufficiently evident, from the fact that two American editions have been issued—one of them, we believe, but a year or two since. Yet, it was written when he was a "Clinical Clerk" in an Edinburgh Hospital, at the age of twenty-three. His other works, on General Practice, Blood-letting, &c., are in almost equal esteem. But his later fame rests principally on his experiments and publications regarding the Nervous System.

Dr. Hall is a man probably between sixty and seventy years of age; his hair is nearly white with age, and his eye possibly a little dimmed. He speaks with perfect freedom, without any notes, never hesitating, never at a loss for a word, and the right one. His style is simple, without any ornament, sententious, and terse. He says what he has to say in the fewest possible words, and condenses into an hour's talk the contents of whole chapters. He spoke in a low voice, but, notwithstanding the large numbers present, the room was so still that there was little difficulty in catching every word.

Marshall Hall's Second Lecture.

Direct, Reflex, and Retrograde Nervous Action—Paralysis, Tetanus, Epilepsy, and their Treatment.

About as many were gathered, on Thursday night, in the Crosby Street Anatomical Theatre, as could either comfortably or uncomfortably be packed together. The general appearance of the audience was the same as before. The most dignified and the gravest, the oldest and the youngest were there. Old heads, that have been many years surrendering their surplus wisdom for the enlightenment of the present full-grown generation, and young men, whose heads ache with the accommodation of even the elements of the medical sciences, adorned the occasion.

[A long account of the lecture was then given, the article being concluded as follows:—]

Dr. Marshall Hall said that the excellent President had been striving to inveigle him into the delivery of another lecture. But he should be stubborn—he had left home for his health's sake, and that must be his apology for his stubborn refusal. He never should forget, wherever he went, the extreme kindness of his friends in this country, and hoped, though an ocean should separate them, he might be kindly remembered—and so he bade his numerous and most attentive audience farewell.

On the 22nd of November we left New York, and commenced our tour through the Southern States. Passing rapidly through Philadelphia and Baltimore, we again visited Washington. Thence, taking the steamer which plies on the Potomac, to Acquia Creek, having passed Mount Vernon, the residence of the great Washington, we entered Virginia, and continued our course by railway to Richmond. Here we were immediately made to feel at home by the friendly Virginians, whose simplicity of manners is so winning. Some of the physicians took great interest in my husband's researches, and, at their earnest request, he delivered two lectures on the subject, these being afterwards published in the *Virginia Medical and Surgical Journal*. One of those little tortoises, called Terrapins peculiar to this and the adjacent States, and considered great delicacies as articles of *cuisine*, formed the subject for demonstration.

My husband thus mentions an interesting excursion:—

Testudo græca.

Whilst at Richmond, I was kindly invited to visit a gentleman, the hospitable owner of a plantation on the James River. I visited the "cabins" of the negro slaves, and saw them at their daily occupations in the farmyard and in the corn fields. Their physical comfort and well-being appeared to me to be perfect.

From Richmond to Wilmington our route lay partly over the "Dismal Swamp," and through the "Pine Barrens" of North Carolina, where my husband took great interest in the mode of obtaining the turpentine which forms the staple of this State.

At Wilmington a terrific storm, which rendered it unsafe for any vessel to leave the port, prevented our taking the steamer for Charleston, and compelled us to adopt the land route—a rough and tedious one of thirty hours—performed partly by stage, over "corduroy" roads, at the rate of two and a half miles in the hour; partly by railways in an incomplete and very dangerous state. The extreme discomfort of this journey exceeded everything we had hitherto endured in travelling.

My husband was, as usual, alive to all that was new on this extraordinary route. The first thing which struck us was the *moss*, as it is here called, a parasitical plant, of a grey colour, which covers the trees of the forest, depending from their branches like drapery, and, when seen from a distance, somewhat resembling enormous cobwebs. Most of our journey through North and South Carolina lay through one continued swamp, in which a profusion of evergreens luxuriated, with occasional "cane brakes," these being sometimes

exchanged for "pine barrens." This large tract of country seemed almost uninhabited, with the exception of here and there a few ragged negroes in a miserable log-hut.

The luxury of a first-rate hotel at Charleston was most welcome after our wretched journey. We were soon surrounded by agreeable people, and nothing which kindness could do was wanting to render our stay at Charleston pleasant and interesting. Dr. Hall gave a demonstration of the Spinal System upon an alligator, caught in the river. It succeeded admirably, and the physicians and medical students were much impressed by it. Finally, the principal physicians of the city did him the honour to invite him to a "complimentary dinner," the whole affair being characterized by great taste and friendliness.

Quitting Charleston for Savannah, by a coasting steamer, and passing Forts Sumter and Moultrie in the mouth of the river, we had a glimpse of the much-famed "sea-islands," which produce that finest growth of the cotton-plant, hence called "sea-island cotton."

Savannah, in Georgia, although not large, contains some excellent and intelligent people. Knowing my husband's interest in everything curious, a friend brought him an alligator, alive, but in a state of hibernation. It was laid on the hearth-rug of our room, and I confess I was not without some apprehension lest the warmth should dispel the winter sleep, in which case our strange visitor would not have been

At this city it is sometimes necessary to plough the streets after heavy rain, to get rid of the water!

the most desirable of companions. The trees here are noble; the woods abound in varieties of the evergreen oak, all of which grow to an enormous size, magnificent magnolias, the palmetto, the orange, the aloe, &c. &c.

Colonel Towne, ex-Governor of this State, hearing that Dr. Marshall Hall was expected at Savannah, although a great invalid, undertook a journey of above a hundred miles, in order to consult him.

Our next point was Macon, the capital of Georgia, a small town, prettily situated. On our arrival, the physicians flocked around my husband, showing him every attention, and driving us to see the interesting environs. But here I must quote my journal:—

A hint had been dropped that the medical faculty of Macon wished to consider the Doctor as their guest; so, to anticipate them, we paid our bill at the hotel before receiving the last visit of Dr. Nottingham. After his departure, however, the amount of our bill was returned to us by the master of the hotel, saying that it had been paid by Dr. N. We were struck with the kind feeling and generosity which this incident evinced. I must repeat that the attentions received by my husband, everywhere, from his professional brethren—I may even say the *friendship* and *reverence* evinced for him in the United States—are not only highly gratifying to us, but extremely creditable to their own hearts and minds.

The site of Macon seems the only exception to the interminable swamps traversed by the railway for so many hundred miles through the Southern States. A very uncouth journey, with the halt of one night at Columbus, brought us, partly by stage, partly by railway, to Montgomery, the capital of Alabama. The new railroad between Macon and Columbus appeared

to be not yet subjected to those rigid and inexorable rules which obtain in more populous districts. The good-natured conductor several times stopped the train to take up a stray passenger. Once it was for the benefit of a fat farmer—(I here copy my journal)—who very perseveringly ran and shouted after the train, which at length stopped for him. The farmer entered the cars panting, after a very hard run, when the following dialogue took place:—

Conductor (to fat farmer)—I have had a great deal of trouble on your account, sir!

Fat Farmer (puffing and blowing, and reeking with perspiration)—And I have had a great deal more, sir!

Much amusement was afforded to the passengers by this mutual recrimination.

Between Opelika and Montgomery a remarkably dandified young man got into the cars, and soon commenced a conversation with my son, of whom he innocently inquired, whether Queen Victoria *always* wore her crown? He also put many momentous questions to him respecting the dress of the Prince Consort, greatly marvelling when he heard that his Royal Highness dressed like other gentlemen!

Mr. G——, of New York, whom we met on this railway, cautioned my husband and son against expressing any dissidence of opinion in conversing with fellow-travellers in these districts, adding that they were irascible, and carried revolvers and bowie-knives.

A passage of forty-eight hours down the Alabama River brought us from Montgomery to Mobile. After a short stay here, during which, through the kindness

of Dr. Nott, we saw what was most worthy of notice, we proceeded by a coasting steamer to New Orleans, the passage affording many rough adventures. We took up our abode at the splendid St. Charles Hotel. At this metropolis of the Southern States there is much to interest. The Mississippi, with its wondrous array of steamers, which might well be called steam-palaces, and the stirring scene, on the levée, of unloading and shipping the varied produce from every latitude of the United States, borne hither on the waters of the broad and mighty river, formed a scene which my husband was never tired of contemplating. At New Orleans he had also many opportunities of gaining exact information respecting the negro. Here he visited several rooms, shops, or "pens," over which signboards, inscribed with the words, "Slaves on sale," were displayed. He continues :—

> At one of these pens I was shown a pretty boy, a quadroon, a native of New Orleans, about ten years of age, who spoke French. After a little time, and as I was preparing to depart, he said, earnestly—"Achetez-moi." He little knew the emotion his simple but imploring words produced in me.

Here, as at Charleston and Savannah, he had opportunities of visiting plantations, and of observing the condition of the slave. One sad scene, which he witnessed at New Orleans, so excited his feelings that he never alluded to it without a shudder of horror, and once, on detailing it (this will be remembered by some friends at Nottingham) his emotion was such that he could not proceed. It was the severe flogging of a slave. In general, the treatment of the slave in

Louisiana is mild, the "code noir" securing to them many advantages not enjoyed in the adjacent, anti-African, repudiating State of Mississippi.

In this gay place we found many very interesting and agreeable persons. The profession were unremitting in their kind attentions during the whole of our rather long stay. Dr. Hall complied with their request by giving two lectures on the Spinal System. The weather, though it was the month of January, had become intensely hot. The theatre in which he lectured, was densely crowded and inadequately ventilated, and when he returned to our room at the hotel, he seemed much exhausted, fell asleep, and then awoke, shivering. An attack of fever confined him to his bed. The malaria which exists in this city, destitute of drainage, and situated below the level of the river, is well known. Added to this source of malady, the rapid alternations of temperature are extremely trying to the constitution. In one night, during our stay there, the thermometer fell from 85° to below 32°—frost succeeding to insufferable heat!

As his first symptoms subsided, brow ague came on. His illness was the more unfortunate, as a public dinner was announced to be given to him by the medical faculty of New Orleans. This took place at the St. Charles Hotel, on January 18th. I quote the particulars from my journal:—

Great preparations were made for this banquet. The tables were magnificently adorned for the occasion. This is the land of flowers, and the profusion and beauty of the bouquets were

surpassing. Besides those which ornamented the tables, one was placed beside the plate of each guest; in short, it was a complete parterre of camellias, roses, &c., of every hue.* About 70 gentlemen sat down to the dinner, which comprised all the arts and delicacies of a first-rate French *cuisine*. Besides the physicians, there were the Minister of War for the United States, judges, lawyers, the British Consul, &c. Through the nick of a door I listened to the speeches. The banquet went off with great *éclat* and hilarity. Nothing could be more sumptuous and brilliant, even in this city of luxuries. My husband retired early on account of his indisposition.

We had entertained the hope of visiting Mexico; but neither my husband nor myself was in a state of health to undertake so fatiguing a journey; we therefore embarked for Havana on the 27th of January. Three days of heavy rolling and pitching were succeeded by a calm sea and a delightful atmosphere. My husband's brow ague had not returned after the first day or two at sea. As we sat on deck, we keenly enjoyed watching the "Portuguese man-of-war," a molluscous animal, which we mistook for the nautilus, gracefully sailing over the clear, indigo-blue waters of the Gulf of Mexico, whilst the flying fish and the sea-hawk followed in our wake. The mountains of Cuba were in sight, and in the evening of January 31st, we were off the Moro, after gunfire, and therefore too late to enter the harbour.

At Havana the picturesque Moorish houses with their *patios* were objects of interest, whilst the tropical vegetation charmed us, as we drove along

The *menus*, artistically embellished, were the most tasteful I ever saw; I preserved some specimens for my friends in England.

avenues of the royal palm and other stately trees, or wandered through gardens of enchanting loveliness. My husband was eager to inspect and collect everything curious, both in the animal and vegetable kingdoms.

His health at first seemed improved by the change of climate; but soon the brow ague returned in daily paroxysms, and yielded only to very large doses of quinine.

It might have been imagined that, in quitting the United States, we had passed beyond the sphere in which my husband's name and works would obtain recognition. But even in Cuba, his fame had preceded him, and we were greeted not only with courtesy but friendliness. The request that he would lecture on the Spinal System was complied with. Being unacquainted with the Spanish language, he lectured in French, and found so much to say and so deeply attentive an audience, that he spoke for two hours. Some of the medical students of Havana evinced a lively interest in his investigations, and continually visited him, zealously seeking the information which he was ever so ready to communicate. He found them a very intelligent, gentlemanly set of young men. Señor Antonio Mestre published the substance of the lecture in Spanish.

We had intended to proceed from Havana to New York by the "Black Warrior," the only steamer then considered safe for that passage, which, in rough weather, is a very dangerous one. Having secured our berths, we went on board; but a dispute had

arisen between the Captain and the Spanish Custom House officers, relative to the cargo of cotton from New Orleans. The Spanish Government declared the ship to be forfeited, and forbade our leaving the port, under penalty of firing upon us from the Moro Castle, if we attempted to do so. The result was, that the Captain gave up his ship to the Spanish authorities, he and all the officers quitting the steamer. We were thus left to take care of ourselves, or rather to be taken care of by the Spanish guard. We remained on board a day and a night, hoping that matters would be arranged, and that we should not be disappointed of our passage to New York. The affair of the "Black Warrior" was, however, destined to be a long and serious subject of dispute between the Governments of the United States and of Spain.

This *contretemps* obliged us to alter our route and to return to New Orleans, ascend the Mississippi, and then, by a long railway journey, reach New York. Accordingly on the 5th of March, after a stay of nearly six weeks at Havana, we again crossed the Gulf of Mexico for New Orleans. On our unexpected return thither, we were greeted with a warmth which was truly gratifying, and before we again left this city, some of the physicians insisted on having a photographic portrait of my dear husband.

On the 18th of March we commenced that perilous passage, the ascent of the Mississippi, an undertaking which appears serious to the Americans themselves, so fearful are the dangers incidental to the ascent of the lower portion especially of this giant among rivers.

During our course we took up a few persons who had escaped destruction in a steamer perforated by a hidden snag. On all sides we heard accounts of heartrending accidents, and it was melancholy to think of the victims who lie deep beneath those devouring waters.

My husband thus describes the banks of the Lower Mississippi :—

> The course of this mighty stream between New Orleans and the Ohio may be divided into three regions ; the first, that from New Orleans to Natchez, or the region of sugar chiefly ; the second, that from Natchez to Columbia, and from this to Memphis, or the region of cotton ; the third, that between Memphis and Cairo, in which cotton, tobacco, maize, and pine-wood grow. The whole comprises seven degrees of latitude, from 30° to 37°, and forms a slave region.

Arriving at the mouth of the Ohio, we had, including our northern tour of the preceding summer, navigated the Mississippi from Sauk Rapids, in Minnesota, to the Gulf of Mexico, a distance of about 2000 miles, the détours of the river increasing it probably to double that number.

After a passage of eight days and nights, through the mercy of Providence, we landed safely at Louisville, in Kentucky. Thence we proceeded up the Ohio to Cincinnati, and by railway to Buffalo, where we were detained a week by my illness. Hence we travelled by rail through the northern portion of the State of New York to the Hudson River Railway, which brought us to New York on the 7th of April, thus terminating our tour, during which we had crossed the United States, between the Atlantic and the Mis-

sissippi, four times, and twice traversed its length, besides visiting Canada and Cuba.

Whilst at Buffalo, my husband wrote the following to Dr. G. Webster :—

April 3, 1854.

I have not *ceased* to study the fate of the poor African in the United States for a single day, and my mind is *now* quite decided on the subject of self-emancipation, and *against* abolition without discipline, and colonization.

I am quite anxious to see and study the Crystal Palace with Mr. Phillips's books in my hand.

How glad shall we be to see you again. Won't we have a good game of bowls together ?

Lectures and public dinners have occupied me in every large city, but chiefly, as I have said, the afflictive case of the poor negro.

Farewell. Every good attend you. Yours, most sincerely, MARSHALL HALL.

In concluding this rapid sketch of my husband's tour through the United States, Canada, and Cuba, in which many interesting details are necessarily omitted, I cannot refrain from a grateful acknowledgment of the extreme kindness which greeted us wherever we went. His works, many of which had been reprinted in the United States, had gained for him a great and widely-diffused reputation in medical science; but the friendship and even affection which he inspired were, I know, attributable to that warm-hearted, simple, earnest character which was so conspicuous and so attractive in him. The kindly sentiments on the part of our Transatlantic friends were reciprocated by him, and he never ceased to entertain the most agreeable

and grateful recollections of his professional brethren in the Western hemisphere.

I believe he left deep traces of his visit to America, not only in the hearts of many, but also in the scientific knowledge which he diffused, and the high and ennobling ideas of his profession which he uniformly inculcated. The letters which he afterwards received from various physicians with whom he had held friendly intercourse, and which are so pleasant and gratifying that I can scarcely refrain from quoting them, give me reason to believe that his visit imparted an impulse in science to many minds, and that the seed which he there sowed will not be without its useful fruit.

In proof of the pleasure which this tour afforded my dear husband, I may mention that, some time after our return to England, he actually proposed to me to revisit America.

With the exception of the intermittent fever which I have mentioned, his health was generally good, having greatly improved soon after leaving London.

On the 15th of April, 1854, we bade adieu to the shores of America, and in the midst of a severe snow-storm and intense cold, embarked on board the Collins' steamer "Atlantic" for Liverpool.

A hard gale and occasional squalls rendered the first portion of our passage unpleasant. The only event of particular interest was the splendid view of an enormous iceberg. On the 28th we arrived at Liverpool, after an absence of nearly fifteen months from our native land.

CHAPTER XV.

WORK ON SLAVERY.

On our arrival in England in April, 1854, we hastened to pay a long-promised visit to my husband's sister, Miss Hall, at Sneinton, near Nottingham. Thrice happy was the meeting after so long an absence! Here he thoroughly enjoyed his quiet and retirement; but it was not in his nature to be unemployed, and he immediately commenced arranging a great mass of material, which he had collected in the United States, relative to the subject of slavery; and very soon the little volume entitled "The Twofold Slavery of the United States" was completed and published.

My son has, in the following pages, made such extracts from the above work, connected by a few remarks of his own, as will serve to place my husband's plan before the reader.

My father, during his tour of fifteen months through Canada, the United States of America, and Cuba, had every opportunity of considering the question of Slavery and the state of the coloured population. I believe that, in letters to various American journals, since republished with additional matter in a small volume

entitled "The Twofold Slavery of the United States," he put forth the only really practical remedy yet proposed.

He saw that the state of the free African was not such as to make liberty an acquisition of value to any except to such as have the energy to struggle, not only against the ordinary tasks and trials of life, but also against the systematic oppression of the African race, even when found in the condition of freedom.

In fact, as the title of his work implies, a second slavery exists, which struck him most forcibly when on the spot. By the laws of some States, a free negro is prohibited, under pain of imprisonment, from residing or pursuing any industrious or useful avocation, and may even be sold into slavery if he persists in such attempts.

In other States, coloured persons who may be on board ships entering their harbours are imprisoned in the common gaols till their vessels sail again!

In Philadelphia no African would be suffered to drive a public conveyance, and a gentleman walking about New York arm-in-arm with a man of colour would stand a strong chance of being mobbed.

Many instances might be quoted; but my present object is merely to show the animus, the unworthy and vile oppression and scorn of the negro entertained by the white man in the United States, even more in the Free than the Slave States, and for this enough has been said.

Hence, up-hill is the labour, and poor the prospect of success for the free negro at present.

Abolition my father considered, therefore, as far

from being a boon to the slave. Negro labour he thought essential for the peculiar climate and cultivation in which they are now employed. To quote his own words:—

Slavery at least feeds and clothes its unhappy victims, so that *animal* life is supported and perpetuated. It is only when the slave is viewed as an intellectual being—as *man*, in a word—that his degradation, his ignorance, his privation of holy marriage and of parental rights, his subjection to the infliction of the lash, his exposure to public sale by auction, and his treatment for the sake of offspring in the "breeding States," stand forth in all their enormity.

The question in regard to slavery in the United States is essentially a question of religion and of conscience. Any other lower view of the subject is utterly unworthy of its magnitude and importance, in itself, and in its relation to three millions and a half (3,638,808) of our fellow-men and brethren, the coloured people in the United States, and to the character of a great nation. It will be perceived, as I proceed, that this high and conscientious view of the subject is happily not incompatible with the best interests of the European in the United States, and of the country at large.

Unprepared abolition, I repeat, would be no boon to the African slave in the United States. It would, alone, only lead to the second slavery to which I have adverted, even if the freed slave was perfectly well conducted. Might it not also lead to ruin both of planter and estate?*

Climate, products, and slavery are, in the United States, correlative. Or, rather, the latitude may be received as, in a certain degree, the exponent inversely of the products of the soil, and of slave labour. It is still a question, whether the white man can bear exposure to the sunbeams and the toil requisite to produce cotton, sugar, and rice, in large quantity, and at those seasons when the labour required is periodically both most trying in kind and extreme in degree.

* "The Twofold Slavery of the United States," pp. 2—3.

Should it prove a physiological fact that the white man *cannot* efficiently produce cotton, sugar, and rice, there is still a choice left, better than that of M. de Tocqueville, who asks, "Mais ne peut on pas se passer de rizières?" viz., that between *slave* negro-labour, and *free!*

The continuation of slavery my father utterly discarded, as wicked before God and man, as degrading to master and slave, to owner and chattel, as financially ruinous, and as tending ultimately to produce servile wars, only too likely to be hastened on by any dismemberment of the Union.

Colonization he viewed as insufficient, as an unjust deportation, and as tending to take labour from those fields in which its value is immense, on account of the power of the African to resist the influences of fever and bad climate.

But he does not put all these objections, these discouraging views, before his readers, without, at the same time, giving a glorious and *honest* remedy.

His plan for self-emancipation strikes at the root of the whole matter. It will be best to give the letter detailing it without abridgment; its logic and originality cannot but strike every unprejudiced reader.

It is but too obvious, from the facts which I have laid before you, that the slavery in the United States is not limited to the slave. The yoke extends to the owner of the slave. Slavery, like a dire miasma, extends its influence to the planter's family, lowering the perceptions and feelings of head and heart towards the African race.

I regard abolition as unjust towards the slave-owner, and

[1] "The Twofold Slavery of the United States," p. 41.

colonization as unjust towards the free but oppressed African. The just emancipation is that which cares for both owner and slave, and for both slave and free.

I never could imagine man having property in man. But in the mode of emancipating the slave, I may surely care for the interests of the master. And if my mode of proceeding also prepares the poor slave for the just use of liberty, I think I shall effect a double good.

If I take from the slave-owner, without loss, an ignorant and degraded slave, and replace him by an intelligent labourer, elevated in mind, body, rank, and powers; if I remove a horde of slaves, and replace them by a fine peasantry, at once faithful and loyal, I shall have conferred no common benefit. And all this, I am persuaded, the project of self-emancipation will accomplish.

And now it will plainly appear that my appeal must be made, not to the public, except for *aid* in my project, but to the planter and to the Slave State Legislature.

It is now a penal crime to teach the poor negro to read or write. Let this derogatory law be rescinded, and let arrangements be made for his education and elevation. Let the same thing be permitted, nay, accomplished for him, as is accomplished for the *peasantry* elsewhere. Let the Bible be accessible to him! Let him be prepared and qualified to carry on a little occupation, shop or farm, if he should ever attain to one. Let the way to greater elevation be open to him.

And, instead of his *daily* task, let fair *task-work* be appointed him; and when this is done, let the privilege of *overwork* be granted to him; let a fair minimum value be put upon him, and let *that* sum be a legal payment for his freedom. Let savings' banks be organized for small sums, granting the highest rate of interest; and when these sums amount to a certain proportion of the whole sum, let the rest be added by the Federal and States Governments, and *societies in aid*, and *let the slave be free!*

Let self-emancipation thus be placed fairly within the power of every negro slave. Let the slave by this mode of emanci-

pation, pass from the condition of *slave* to that of a *hired servant;* or let him, if he prefer it, *emigrate.* Let the negro slave be further assisted in his emigration to *Liberia,* his fatherland, thither to carry back with him the knowledge and blessings of civilization, of freedom, and of industry; and, may I not add, of holy religion! But above all, let him be freely permitted to remain, as a servant for wages, in the same place and under the same master, where he formerly wrought as a slave under the lash. Let us see which proves the more profitable to the planter; no one will doubt which is the happier to the poor African, which is the more honourable and safe to the United States.

The object of this suggestion is, not that of immediate and total emancipation, reckless of consequences to both owner and slave. It is that of a *self,* yet *aided,* emancipation; gradual, progressive, and finally complete; combined with the simultaneous discipline and elevation of the African race; repairing, and more than repairing, the wrong which has been done to it.

Even under existing circumstances, it occasionally occurs that the negro slave effects his own emancipation. This is achieved, however, through years of toil, of self-denial, and almost of despair. Let us *help* the negro, in these his noble praiseworthy efforts; let the legislatures, and let the philanthropic public extend their aid to these strugglers for self-emancipation from slavery, for liberty, and for the rights of men.

This plan is based on the character of the individual negro himself. 1st, on his own *desire* for freedom; 2nd, on his own industry, frugality, and habit of saving; 3rd, on the best kind of education—viz., thrift, self-dependence, and self-control, &c.; to this kind of discipline and education, other education of every useful kind—viz. reading, writing, and arithmetic, &c., manufactures, trades, letters, and even science—being superadded.

In this manner the property of the slave-owner, all disputes about its right or wrong being discarded, is respected;

the rights of the coloured man are restored; being free, he will continue to cultivate the rice- the coffee- and the sugar-field; and what further good will not be achieved in relation to progress, morals, religion!—marriage at least will be legalized and made holy, and indissoluble at the will of man.

Let us compare emancipation of an unconditional kind with this self-emancipation. Unconditional emancipation would set many a negro slave free who afterwards would not possess the ability or the conduct to take care of himself, and who would suffer from hunger and want, and be guilty of intemperance, perhaps of crime. Self-emancipation will begin with a training and discipline which will entirely obviate such calamities. Unconditional emancipation would deprive the proprietor both of his property in the slave and of the labour of his slave. Self-emancipation, such as has been described, will do neither; the value of the slave will be paid to the owner; the free slave will continue to serve his former owner, if kind, as a servant does his master, for a just and proper hire. Unconditional emancipation would leave the infirm without support. Self-emancipation will, at the first, not include the infirm; but, after a time, these will come to be cared and provided for, as the free labourer is elsewhere.

To this suggestion I propose respectfully to beg the attention of the friends of the African race and the American people. I know how many propositions to effect emancipation have failed, yet venture, not without some hope, not to say confidence, to suggest yet one more. Happy the day when the healthy and able African slave *may*, if he *will*, achieve his own emancipation, and exchange his lot and condition from those of the bond-slave to those of the freeman! and in that very achievement *fit* himself for freedom, for paid service, for industry, or for enterprise.

Some would neglect even the opportunity of doing what is here proposed. They are the indolent, the unthrifty, the senseless, to whom freedom would be no boon, and its glorious privileges no joy; but others would toil for the desired prize with an enthusiastic zeal. In either case the black spot and

the reproach of *forced* slavery would be removed from this land, now of partial, then of perfect freedom.

In aid of this philanthropic scheme, let the benevolent contribute their money and exert their influence and efforts. Let a *Society in aid of Self-emancipation* be instituted, the glory of the whole world, and especially of America! Let all who love liberty and right—let all who admire and would preserve the greatness of the United States in their union and in their glory, lend a helping hand, first to mitigate, and finally to extirpate the evil, the wrong, and the shame of slavery!

. . . . . .

I have already adverted more than once to the extent of meaning which I affix to the expression "self-emancipation." I am persuaded that it is *not* by any effort of the North, but by a noble and generous movement in the South, that the emancipation of the slaves and the abolition of slavery in the United States must eventually be achieved. The great work must be a work of *self*-emancipation.

The chivalrous people of the South must see and feel the sin, the wrong, the error, and the shame of slavery, and raising their voice, call upon the North for AID in the noble and difficult task of uprooting and abolishing it—the want, the work, the reward being alike their own.

I am persuaded that all this *is* and will be acknowledged by the Southern people and States eventually. It is with this conviction, with this feeling, that I shall briefly revert to the wrongs of slavery, which are not the wrongs of the slave only, but of the slave-owner. I sympathize with both. Is it possible that any pain endured by the slave, which is chiefly physical at most, *can* surpass the poignancy of mental anguish experienced by the inflictor of such pain, when, in secret, in the silence of the night, on the bed of sickness, he meditates on the wrongs in which he has, perhaps very unwillingly and remotely, been the inflictor!

Jefferson, the owner of slaves, said, "I tremble for my country" (and he might have added, for myself and my

family) "when I reflect that God is just" (and again he might have added, that He is holy and righteous), and "that his justice cannot sleep for ever."

Having begun in *man-stealing*, slavery has continued the perpetuation of the wrong. It involves a system of unholy and sinful adultery—of unions of the sexes without marriage, of separations contrary to the express law of God, of second unions, &c. It deprives our fellow-men of the rights of parents, of citizens, of men! Who can be *partakers* in such things and *not* "tremble"? Who then, in his heart, does not devoutly wish to be *emancipated* from such guilt, from such *slavery?* For what is the sinner but the *slave* of sin?

I am not writing a homily, but plain and simple truths. Again, I ask, who would deliberately choose to live—and die—or have his children born—and left—slaves in such bonds as these? For we all know that "God is not mocked," and that He hath said, "Vengeance is mine," and that, as we sow, so shall we reap, except that for the wind we shall reap the whirlwind.

Who can endure these thoughts? Let us then make a strenuous effort and achieve a noble self-emancipation from them. Great and sad is the bondage of the poor negro-slave; greater and more sad is that of the slave-owner. There is one mode of escape from both. It is that of a well-devised and well-executed plan of self-emancipation for the negro-slave. None but the planters can accomplish all that is implied in such a plan. Let them, then, in noble and generous spirit, make the first experiment, and know, assuredly, that in emancipating the negro slave, they emancipate themselves.

Let the first self-emancipated negro slave become the overseer. Let the next be paid for his labour according to his industry. Let every reward be assured for good conduct. Let laws, and severe laws—a "rural code"—be enacted against idleness or vagrancy; and let every unjust law be rescinded.

Let education, discipline, a pure and holy religion, just rewards, and just punishments, do their work. Let us free, and

raise, and guide the poor negro, and God will bless us in our good work; and let us remember that in emancipating him from his yoke, we really emancipate the country, and ourselves and our children from a yoke still more galling and fearful.

As slavery is assuredly the dark spot on the United States, the absence of marriage—such marriage as is holy and indissoluble—is the dark spot on slavery. It is a national sin. It is a sin in all that are in anywise partakers in it—in the master more even than in the slave. It is not possible during such a state of things to avoid the dreadful denunciations of Holy Scripture against it. He, therefore, who deliberately, from whatever motive, sanctions slavery in the United States as it is, as *deliberately* renounces the religion of Christ. I cannot say less, and more fearful words cannot be written.

You will now perceive all that I comprehend in the objects of self-emancipation. It is, first, that of the negro slave from slavery, by efforts greatly his own, but aided by the government, both State and Federal, and by the philanthropist. It is that of the poor negro, slave or free, from ignorance, degradation, oppression. It is that of the slaveholder from the guilt of sin against God, and of sin against his fellow-man. It is that of a great nation from a national sin, crime, and shame. And now I picture to myself the fields of Georgia and of Louisiana, and other southern States, cultivated by free labour: the negro race raised from bondage, from ignorance, from oppression; the southern planter from the worse bondage of sin and guilt. How glorious will that spectacle be before the whole world! A nation emancipating its slaves, its people, ITSELF, from slavery!

I have not, in this letter, deemed it incumbent on me to discuss the question whether the marriage relation can exist amongst slaves or not. Judge Jay says:—"A *necessary* consequence of slavery is the *absence* of the marriage relation." Thus, slaves live in adultery, and this by and with the consent or order of their masters, who thereby become "partakers" in their sin. But if the marriage relation do exist, then, "whom

God hath joined let no man put asunder." But the owner of slaves does put the married asunder when he sells the husband or the wife to the north or the south. And I can imagine nothing more essentially blasphemous than the Satanic doctrine of the ministers of the Savannah River Baptist Association, in reply to the query whether parties so married and so separated may marry again; viz.,

"That such separation is, civilly, a separation by death, and they believe that, *in the sight of God,* it would be so viewed."

I trust the day is not far distant when each slave-owner will say:—"O my soul, come not thou into their secret!"

For what saith the Lord, the supreme Judge of the whole earth? "The words which I say to you, *they* shall judge you in that day;" and "If a man putteth away his wife," &c.

To the gentlemen of the South, I would appeal in the awful words of an Apostle—"Whether it be right, *in the sight of God,* to obey man rather than God, judge ye;" and in those of a Prophet, I would conjure them—"Come ye out, and be ye separate, and touch not the unclean thing."

Or rather, legislate for the self-emancipation of your own negro slaves, your country, and yourselves; accomplish it duly, wisely, progressively; let not a day pass without giving to them the holy institution of marriage; and let not a day pass without *beginning* the good work of their education, elevation, discipline, and preparation for freedom, and for the privileges and the duties of citizens.

The God of battles hath favoured the cause, and fought the battles of American independence. Will He not favour the good cause of the poor African crying to Him for justice too?

There is something beneath the dignity of man and of a great nation in enacting laws, the object of which is to inflict on a part of its people a degrading ignorance. It is such a cowardly and ignoble thing, that I cannot believe that the high-minded and chivalrous people of the Southern States do not writhe under it. To them I would therefore say, Emancipate yourselves from such a derogatory thraldom.

But the question assumes a graver aspect when it is considered, not in relation to mere knowledge, but to religion.

It is grievous to think that 3,204,313 people are forcibly deprived of the privilege of reading and writing even, that it is a crime to teach these simple letters. But it is more than grievous to know that free and open access to the sources of instruction in holy religion are, in remote districts, cut off from them. This is not only grievous but fearful. He who said, "Go into all nations, and preach the gospel to every creature," will be our righteous Judge, and all hearts will be open to Him.

I appeal to the gentlemen of the South, to effect their own emancipation from unholy, unrighteous slave-ownership, because they alone *can* accomplish this great object; *others* may *aid*—but *they* must *achieve* the victory over slavery—a yoke which is not less upon them than upon the poor negro, and more guiltily. Theirs is at once the duty and the power, and theirs only. Their emancipation must be self-emancipation.

The foreigner, their fellow-citizen of the world, the Federal Government, the philanthropist, may and will aid and assist; but the great and righteous work must be their own. The States possess the legislative and executive power of the States; the slave-owner possesses the power over his own slaves to deal with them as he will, whether for their thraldom or their freedom, whether for their wrong or their right, whether to confer on each his own wife and child, or to withhold them and sell them whither he may never go to see them more—"cause" him to commit a fresh adultery, and share, and more than share his guilt.

To these gentlemen I would say—Emancipate yourselves, and emancipate your wives and your children, the inheritors of your estate, from such slavery and guilt. Let the deed and the reward be your own!

I might now appeal to the Northern States and to the nation at large. But which of these does not feel that the national honour, and, if we believe in the righteous judgment

of God, the prosperity of the United States, are involved in the extinction of unjust and sinful slavery from the land? To the chivalry and the honour of its people, the appeal cannot be made in vain.

I will never lower the dignity of my subject by discussing its relation to profits. I will only say that it is demonstrable that free labour is more economical than that of the slave. But I revert to the honour, the right, and the religion of the question; and I call on the American people, from the North to the South, and in the length and breadth of the land, to achieve their own, their self-emancipation from the sin, the wrong, the error, and the shame of slavery!

In doing this, I do not disguise from myself the real difficulties of the task before us.

He who would effect the emancipation of the negro slave in the United States, must devise the means of accomplishing the following objects.

He must provide safely for the gradual emancipation of 3,204,313 negro slaves in the midst of the Anglo-Saxon race; he must provide that the labour now performed by these 3,204,313 negroes be still well and duly performed. This must be accomplished under a burning sun, in a malarious atmosphere, and on a soil which the white man can scarcely bear, but which the negro supports with impunity.

It must not be forgotten that the experiment of sudden emancipation in Jamaica was an utter and melancholy failure, and that some wiser and safer plan must be devised. It must be seen that the idea of the emigration and colonization of the 3,204,313 negroes of the United States, with their continued offspring, in Liberia, is an utter impossibility, the numbers alone being considered; and it must be remembered that these 3,204,313 people are not generally willing to go and leave their new, their native, and their adopted country. It is certain, too, that the place of these 3,204,313 negroes could not be taken in the cotton- the sugar- and the rice-fields by the white race of mankind, ever, and certainly not in less than centuries of years.

What then is the remedy for so much evil and wrong in the midst of so much difficulty? I can perceive none except self-emancipation, in the enlarged sense in which I have taken and explained that expression—its education, its discipline, its elevation of the negro race; the exchange of his labour as a slave for his paid services as justly hired; the liberty of freely advancing himself in the scale of society, and of remaining, like the Hebrew nation, in the midst of another race of men, yet separate; a self-emancipation on the part of the slaveholder too, and on the part of the American people!*

We Englishmen, who have won our liberties and our glorious Constitution by the arduous struggle and the matured experience of centuries, have our love of that liberty to which we have so gradually attained, and of the equality of all men before the law—and I hope and trust I may add, before God—so deeply rooted in our earnest, our deep thinking, and I must admit obstinate natures, that we cannot so much as imagine a whole nation seriously and calmly submitting to the degradation of holding 4,002,996† of themselves in an adulterous bondage!

But so it is! May the nobler portion of our Transatlantic brethren weigh the words of Marshall Hall, and apply his scheme, unless a better should be found. A blessing, such as is promised to those who fear God and do His will, *must* and *shall* attend their efforts.

Retribution comes, even in this world, and to nations as well as to individuals. We must hope that

* "The Twofold Slavery of the United States," p. 59 *et seq.*

† Census of 1860.

the present dangerous crisis in the history of the United States may be passed in safety, and its citizens be led to legislate conscientiously for the future of both races; never surely was there a case in which justice and self-interest went more closely hand in hand.

CHAPTER XVI.

WINTER IN ITALY—PARIS.

DURING our stay in the neighbourhood of Nottingham, the medical profession at that town kindly invited Dr. Marshall Hall to a *soirée*, at which he delivered a lecture on the Spinal System.

His general health was now restored, and all thought him looking well, though rather thinner, which was attributed to the greater amount of exercise which he had taken since quitting practice. We spent part of the summer of 1854 in London, and, with our valued friend, Dr. Webster, of Dulwich, were present at the opening of the Sydenham Crystal Palace.

That favourite resort of my husband's was frequently visited by him in company with the late Mr. Samuel Phillips, whose society he much enjoyed. From the Palace we often adjourned to dinner at Mr. Phillips's house, the evening being spent in listening to a charming tale which the latter was then writing, and which he read to us during its progress. It was dedicated to my husband, in grateful acknowledgment of the important benefit his health had derived from

The title of the story was, "Something Original."

his advice. Mr. Phillips had had much opportunity of observing him, and was forcibly struck with his genius, simplicity, and genuine warmth of heart. He even entertained the idea of becoming his biographer, as the following extract from one of his letters to my husband shows :—

> as serious when I spoke of writing your life. The thing shall be done. Let Mrs. Hall forward to me from time to time all particulars concerning you, and I will keep them in a book which shall be called after your name. When the materials are sufficient, I will then set to work, and endeavour to do you the justice you deserve.

Mr. Phillips was also to have written the important biography of our illustrious Duke of Wellington, as likewise that of the poet, Samuel Rogers. Death, however, cut short these and other literary projects. The tale was unfinished, the biographies unwritten, when, in the prime of life and intellect, this gifted and genial man was, alas ! snatched from his family and friends. Colonel Francis Seymour says, in a letter to myself :—

> I had many conversations with poor Mr. Phillips about your dear, good husband ; it was a favourite subject with him. He thoroughly appreciated your husband's noble character—so simple, so true, so unworldly.

We had intended to proceed to the Continent in August, 1854, but the frightful mortality from cholera in some of the localities we wished to visit, rendered it desirable to defer our journey.

While thus detained in London, my husband was invited by the lecturers at the Chatham Street School

of Medicine, at Manchester, to deliver some lectures on the Spinal System. He accepted the invitation, and we were hospitably entertained as the guests of Mr. and Mrs. Southam, at Salford.

The lectures, three in number, "were attended by a large body of students and by the leading members of the profession resident in Manchester and the surrounding towns.

The intervals between the lectures were agreeably spent in visiting the extraordinary factories of Manchester and in partaking of the kind hospitality of various physicians of the place. Unfortunately, after the second lecture, my husband was attacked with slight laryngitis, and it required great care to enable him to deliver his third lecture and thus complete the short course. In seconding Dr. Wilson's proposed vote of thanks to the lecturer, Dr. Noble made the following remarks, which I extract from the account published in the *Lancet*:—

Thanks, certainly, were eminently due to their distinguished visitor for his kindness in coming amongst them, and in thereby giving to the gentlemen present an important advantage. They had not only had the gratification of meeting the propounder and discoverer of great physiological truths, but that also of listening to his own exposition of them, and of witnessing some of the experiments and demonstrations by which they are substantiated. And here he would observe that, however accurately such doctrines might be learnt from books, by the aid of diagrams, and by repeating the experiments, there was always an especial benefit in drinking in knowledge and valuable precepts at their spring. Look at certain

See *Lancet* for October, 1854.

analogies in literary experience. How clear and effective was the appreciation of history by him who had gone for his knowledge to the sources—to the old quartos and the big folios, instead of to modern duodecimos! He could speak with gratitude of his own experience. He supposed it was some twenty years since he had first applied himself to the physiological discoveries and practical teachings of Dr. Marshall Hall; probably he soon acquired a fair appreciation of their nature and value. Seven or eight years ago, however, he had had the privilege through Dr. Hall's kindness and courtesy, of witnessing at that gentleman's own house a long series of experiments made by him, and for several days of conversing with him upon all the allied topics; and from this experience he could tell how much more clear and decided was the apprehension of facts and conclusions learnt in this way. The brief course of lectures now terminated had, in some measure, furnished the students, and the numerous practitioners who had attended the course, with a similar advantage. He was sure that they would feel, as he had felt, in having been so privileged, delighted to have been taught the physiology, and much of the pathology, of the Spinal System by the eminent mind that conceived the same; and to have had demonstrations presented to them by the hand that first brought them out. For all these reasons, it was with pleasure, sincerity, and pride, that he seconded Mr. Wilson's motion.

Dr. Marshall Hall then rose and thanked the mover and seconder of this vote of thanks; and, after briefly observing that nearly a quarter of a century had elapsed since he first began the studies which led to the detection of the Spinal System, urged the students present to pursue their profession with enthusiasm, and early to select some special subject for study and investigation. Such a proceeding was sure, in due time, to bring its reward in reputation and in practice.

It may not be without interest to those who were present on this occasion to know that they then listened to the last lecture ever delivered by Marshall Hall.

We remained in London during the whole of that fearful season of cholera, in 1854, and in November recommenced our travels.* After a few weeks spent at Paris, chiefly in the society of our kind and excellent friends M. and Madame Louis, then weighed down by a recent heavy affliction, which my husband constantly sought by his sympathy to lighten, we proceeded southward, with the intention of passing some time in Italy, our son, with his bride, having preceded us on this route.

Between Lyons and Marseilles, Dr. Hall made the following memorandum :—

Dec. 15th, 1854.—We were struck at the sudden change of climate as we left Valence. Here we saw the olive, the fig-tree, and the vine, and a few cultivated spots of the *garance*,† which grows three feet deep in the soil during three years.

At Marseilles, where we were joined by our son and his wife, we engaged a commodious carriage with four excellent horses, and proceeded to Nice. During a week spent there, we took many delightful walks, which afforded my husband great pleasure. One day we strolled as far as Villafranca,‡ enjoying the beautiful scenery and the fine weather.

On a clear, bright day we commenced our journey to Genoa. Who, that has beheld it, can forget the

* This journey was undertaken entirely from choice, my husband being then in good health. His extreme susceptibility to cold was a symptom which first appeared in 1856.

† The madder, *Rubia tinctorum*.

‡ Not, of course, the Lombardian Villafranca, afterwards celebrated for the political events associated with its name.

scene when, ascending from Nice, and the summit of the pass being gained, the traveller sees on the one hand the sparkling snow-summits of the Piedmontese Alps, and on the other looks down over the picturesque rocks which border the Mediterranean, including the charming little Principality of Monaco? With what keen enjoyment did my dear husband traverse the extraordinary *Cornice* road which, winding its course half way between the rugged mountain tops, and the serene blue waters of the Mediterranean which lave their bases, presents an enchanting combination of the stern and the soft beauties of nature; now mounting to the giddy crest of a bold promontory, and now descending deep into the indentations of some fair bay, in the recesses of which the myrtle, the orange and citron groves, and a thousand other odoriferous plants, perfume the air with their delicious fragrance! With the buoyancy of youth, he bounded up the steep ascents, frequently walking miles in the course of the day, and only resuming his seat in the carriage when the quickened pace of the horses rendered it necessary.

During a night spent at Savona, we experienced two shocks of an earthquake. At the latter place we had the pleasure of meeting with the Rev. W. Adams, Rector of Throcking, Herts, who has kindly furnished me with the following little history of his acquaintance with my husband:—

A few days after Christmas, 1854, I was travelling along the magnificent Cornice road from Nice towards Genoa. I had slept at Oneglia, and trusting to the assurance given me

at the bureau, that the diligence would arrive at Genoa by daylight, I had secured a place in the banquette. This elevated position, beside the conductor, whilst enabling me to enjoy the wonders of the route, also made me aware that a serious fracture had, unknown to the other passengers, occurred to the *mécanique*, or drag of the diligence—this *mécanique* being the only thing trusted to at the dangerous passes of the road, to prevent our plunging over the precipices into the Mediterranean. The delay occasioned by this caused it to be dark before we had reached the neighbourhood of Savona, and as I had no wish to pass on to Genoa in the dark and in extra peril, I there determined to give up my place in the diligence, and trust to chance for finding a bed and getting on the next day. I could only procure a man clad in goat skins for a guide, and he took me across a rough and lonely country, in the dark for more than a mile, to the hotel. Right glad was I to get there, for as we could not understand each other, when I spoke he thought I was urging him to go faster. So, from the pace we went, and the slight suspicion which his appearance suggested, that he might quite as probably be leading me to a den of thieves as to the hotel, I arrived there much heated. At mid-winter, even in those sunny regions, it is not very sultry at night, and I soon began to feel chilly. In the *salle-à-manger* I found about a dozen travellers of various countries. The room seemed cold and cheerless, and with some difficulty I induced the master of the hotel to light a fire, around which the whole company crowded, perhaps wondering they had endured to be so long without it. But *one* of them came to me and, in a pleasing tone and happy choice of language, expressed his thanks for the addition I had made to the general comfort—this was my first introduction to Dr. Marshall Hall. His manner was so frank and cordial that we soon got into friendly conversation, when he interested himself in the mishap which had brought me there, and at so late an hour. Later in the evening, after speaking with the ladies of his party, he came and said they were travelling by Vetturino, that they had a spare place, and that if I would

accept it, it was quite at my service to Genoa. He perceived I had some hesitation—doubting whether I ought thus to inconvenience a perfect stranger—and I was struck with the tact and delicacy with which he made the matter perfectly smooth. He said that although the whole vehicle was his, he would leave me to make some little arrangement with the owner, who was also the driver, by which he would be most agreeably surprised; and as for himself, he wished much to hear further of some mutual acquaintances and subjects we had already spoken of.

Thus I went with him the next day to Genoa, became pleasantly acquainted with Mrs. Hall and his son and daughter-in-law, who were accompanying him, went to the same hotel, visited, in his company, many of the sights of Genoa, and had frequent exchange of sentiment, all which ended in a proposal that I should join their party and travel forward with them towards Rome. This proposal I was delighted to accept, as not only had I learnt to value his society, but the kindness of the whole party was very grateful to me, suffering, as I then was, under circumstances of great bereavement, and journeying otherwise alone.

Thus we passed on by Vetturino along that beautiful land, through Sestri, the Gulf of Spezzia, Carrara, Pietra Santa, &c., to Pisa; at last parting with him (except by correspondence) at Rome. Five years, at a time of life when our retentive faculties do not improve, and bringing with them, as they do to all of us, many events and changes, have effaced much that was then felt to be most interesting and valuable; but well can I recal the pleasure of those days of travel, and the solid information to be gathered from his converse. I was flattered also by the confidence which, after a time, he reposed in me, and which led to his urging me to be again his companion during a tour which he contemplated for the following winter, through Egypt, the Holy Land, Greece, &c. Calls of duty alone prevented me from joining in this, but I assisted him in making some preparations for it, though after-circumstances prevented him from carrying it out.

Among the traits of character which most struck me, was his power of close observation. Nothing seemed to escape his notice, and he applied to things his reasoning faculties, so as to probe their nature and deduce from them real information and rules of conduct; and this, from an earthquake (we had two shocks whilst at Savona) down to the minute occurrences of each day. Then, the *originality* of his views, and the unhesitating manner in which he expressed what these were, and his firmness in maintaining his opinions, as long as he believed them to be right, forcibly struck me. His diligence was also very remarkable. During his residence at Rome, busied as he was in exploring its wonders and in acts of kindness to his friends, he gave several hours every day to the study of Hebrew. The warm sympathy he evinced towards all under suffering prompted his ready action for their relief; and not only for those immediately around him, but for mankind at large. This is very manifest in his work on the "Twofold Slavery of the United States," and the plans therein given for its mitigation and ultimate extinction. The genial warmth of his friendship could be appreciated only by those who were privileged to enjoy it; I therefore consider the somewhat annoying circumstances I have related, which led to my introduction to him, as among the very fortunate ones in the course of my life.

Between Genoa and Pisa, the *Strada di Levante* interested my husband scarcely less than that of the *Ponente*. During one day's journey we seemed, as he said, "to penetrate the very mysteries of the mountains." At Pisa he had much friendly intercourse with the Professor Matteucci, who had visited us in London. During the few days that we remained here and at Leghorn, he was consulted by several English residents. Sir Henry Bulwer, then British Minister at Florence, came from the latter place to Leghorn for his advice, having formerly been his patient in London.

Arriving at Rome in January, we remained there till April. Although this was not my husband's first visit to this classic city, he had never hitherto had sufficient time at his disposal to allow of his deliberately examining and enjoying those wonders of the ancient world which are there so abundant. I firmly believe that no scholar, no poet, ever sought these out with greater enthusiasm, or contemplated them with more intense delight. There was in his character the most exalted admiration of whatever is, in itself or by association, grand and beautiful.

The deep interest with which he almost daily visited the Coliseum, the Forum Romanum, and innumerable other stupendous and glorious remains of ancient Rome, knew no diminution and no satiety. During our three months' residence in this capital, we generally spent the greater part of the day in long pedestrian explorations. Sometimes (and how well do I remember the peculiar pleasure which this afforded him), whilst wandering at hazard, we came unexpectedly in view of some monument of antiquity; in fact, I think none were overlooked. Although our rambles were very extensive, I do not recollect his ever appearing fatigued; and his health was excellent. As a specimen of our daily excursions, I quote the following from my journal:—

March 11. A pleasant stroll from the Piazza Barberini by S^ta^ Maria Maggiore towards S^ta^ Croce, passing the Arch of Galienus; then the trophies of Marius, and an interesting view of Minerva Medica, with many portions of aqueducts, &c. The tramontana rendered the air tonic and the scenery clear and beautiful.

March 12. Walked to the Vatican; spent an hour and a half in the galleries; then took a carriage to the Villa Panfili-Doria; rambled over the charming grounds; the view of the mountains, &c. was clear and most lovely. Strolled through the Porta Pancrazio; Acqua Paolo fountains; San Pietro in Montorio; crossed the Ponte Sesto; at the Piazza S. Andrea della Valle took a carriage home. The day was beautiful, with a tramontana, and we enjoyed our walks beyond expression.

Sometimes we had charming drives in the Campagna, and a few days were spent at Tivoli. We had many friends in Rome, and he much enjoyed social visits and a friendly chat, though he had no taste for more ceremonious visiting. Once only, we prevailed upon him to avail himself of the invitations of the French ambassador, and to accompany us to one of the brilliant receptions of his Excellency and the Countess de Rayneval. The noble suite of saloons at the Colonna Palace, thrown open on these occasions, the distinguished personages met together there, and the blaze of diamonds exhibited by the Roman princesses, had, however, little interest for him, and he absented himself from the subsequent *soirées*.

His extraordinary mental energy, even at the age of sixty-five, was evidenced while at Rome, by the zeal with which he applied himself to the study of the Hebrew language. He had long had an earnest desire to read the Old Scriptures in the original, and, thinking that this was a good opportunity for study, engaged a Rabbi to give him a daily lesson. His Hebrew books and writing were now constantly beside him. Awaking in the night, or early in the

morning, his eyes were strained to acquaint himself with the minute "points;" in short, had he been a young undergraduate, anxiously reading for honours upon which the success of his whole future life would depend, he could not have been more devoted to his studies. The Rabbi declared he had never had a pupil who made such rapid progress. At length I induced him somewhat to relax in his prosecution of this study, fearing the effect upon his sight; but he ever retained his interest in it. At Rome he attended a gentleman with whom he had become acquainted in travelling, through a very severe illness. As he would not accept any fee, the patient begged to be allowed to present him with some token of his gratitude. "Then you shall give me some Hebrew books on your return to England," was the reply, which settled the question. The books were not forgotten.

Dr. Pantaleone and the principal English physicians residing in Rome expressed a desire that he should give them a demonstration and a lecture on the Spinal System, which he accordingly did, at the house of Dr. Pantaleone.

A visit to the catacombs of Sant' Agnese, accompanied by the Padre Marchi, was deeply interesting to him. Under the guidance of the Padre, we spent nearly three hours in the exploration of these extraordinary subterranean regions.

On the 17th of April we quitted Rome for Naples, travelling, as on former occasions, leisurely and enjoyably. The weather was perfect and the whole route charming.

At the time of our two former visits at Naples, Vesuvius had been in an active state, flames issuing from the crater at intervals of three or four minutes; we now felt a little disappointment at its tranquillity, a column of smoke, even, being scarcely perceptible; but the mountain soon began to make ample amends. I here copy my husband's notes :—

THE ERUPTION OF VESUVIUS IN MAY, 1855.

During five years Vesuvius had remained in a state of inactivity, when, on the 1st of May, 1855, indications of an eruption manifested themselves.

Early in the morning of the 1st, smoke and fire appeared, occupying a point on the north-west side of the mountain, and red-hot lava began to flow down the Atrio del Cavallo.

On the 2nd of May, we all left our hotel at a quarter-past five p.m. for Vesuvius, driving up to the Hermitage, and then walking about a mile to the incandescent stream.

The distant view [from Naples] presented a zigzag line of fire. As we approached we saw the *movement* of this stream of lava : in some points solid masses were turned over and moved downwards; in others, bright points occurred where some tree or other combustible was inflamed. Nothing could be more splendid. It was a river of fire from fifty to one hundred yards in breadth !

We had seen the Falls of Niagara and the glacier of Argentière, both of which are of a stupendous beauty; but this was sublime and fearful.

The lava on which we stood, near this stream, was warm, and, on raising a portion, the substratum was red-hot ! Was it quite safe to be there ?

The view was magnificent, and our position possessed quite sufficient of the fearful to make it sublime : a scene of moving molten masses of liquid fire.

The stream issued, not from the summit of the mountain, as heretofore, but from its north-western side, on which seven

apertures existed. From the highest of these a burst of fire took place *upwards*, from time to time.

The stream seems to issue in a viscid half-liquid state; whilst its surface, and especially its edges, cold by contact with the atmosphere, becomes solid—forming a *channel* and floating or rolling masses. The lava remains long incandescent, even when it has become solid, being a bad conductor of heat. On the same principle, the masses of consolidated lava are formed in minor masses, giving to the general mass of surface the most irregular forms, frequently with sharp and prominent edges and projections.

Even when these masses are the smallest, it is difficult and even dangerous to walk upon them.

The grand and memorable scene just described was witnessed by all of us on the night of our visit to Vesuvius. The loose masses of lava alluded to were extremely difficult to climb, somewhat resembling the moraine of a glacier, with the additional difficulty caused by their rolling and giving way under the feet; and the heat from the river of fire was scorching.

The eruption continued, and our son was extremely anxious to ascend by daylight, in order to examine the orifices whence the fire issued. It was arranged that he should accompany Dr. Bishop, of Naples, for this purpose. My daughter-in-law and I felt much apprehension at his undertaking so dangerous an enterprise; but on my husband's determining to accompany them, we were both reassured, feeling satisfied that he would sanction nothing rash. Before their departure, he fixed the hour for their return. When this passed and they were not arrived, our anxiety became great, knowing his usual extreme punctuality. At length,

however, they returned in safety from this somewhat perilous expedition, respecting which my husband wrote the following memoranda:—

On Saturday, the 5th of May, I ascended to the summit, with Dr. Bishop and Marshall.

From the great crater at the summit there issued much smoke, consisting chiefly of sulphurous acid gas. This proved extremely irritating to the nostrils and bronchia, inducing sneezing and coughing.

Three openings existed near together along the edge of the crater at the very summit, which emitted a similar vapour.

At points considerably lower, three larger openings were formed on the north side of the cone, from which immense quantities of smoke issued, mingled with fire, differing somewhat in colour, and depositing sulphur of a light green, orange, and bright yellow colour. At a distance the green sulphur, spread over ancient lava, was mistaken, even by our guide, for vegetation, but proved to be sulphur on a nearer examination.

Below the third of these larger openings there was a *cascade* of red-hot lava from the edge of a precipice of immense dimensions, presenting a sublime fall of liquid fire.

Along this part of the cone, masses of stone continually rolled down the slope, dislodged by the movement of the cone, (for none were ejected,) which some of our party felt distinctly.

Below the fall, the lava proceeded in a continuous stream, consisting partly of flowing, partly of rolling masses, pursuing an irregular course downwards in the *Atrio del Cavallo*, in one place dividing into two, in others taking a zigzag turn. From its surface a dense smoke arose generally, but in some places the existence and combustion of a tree gave a bright blaze of light.

The surface of some parts of the lava stream had already cooled and consolidated sufficiently to admit of our walking

over it. This surface was crisp and wave-like, and in some parts sounded hollow when struck with our staffs.

We picked up one specimen of porous lava, in a crevice of which a fly of considerable size was imprisoned—a miniature picture of the events of Herculaneum or Pompeii!

Our boots were torn to tatters.

This eruption, which was in many respects very remarkable, and unlike any preceding ones, after continuing about three weeks, gradually subsided.

During our stay at Naples, we made numerous excursions in that most interesting locality. These were indeed not new to us; but who can revisit scenes so rich in natural beauty, physical phenomena, and classic association, without intense admiration? My dear husband appreciated, enjoyed, and examined everything.

At Pæstum, those ancient among ancient temples—grand in their decay, and stately in their loneliness—riveted his attention.

The splendid new drive from Vietri to Amalfi, high above the shores of the Gulf of Salerno, which we had formerly traversed by a rocky path, upon donkeys, enabled us to enjoy at ease some of the most exquisite scenery to be found on this globe.

The following notes were written by him in pencil, on another occasion, as we drove along:—

April 27th, 1855.—And now we are in view of Pozzuoli, that is, of Puteoli, the spot on which Paul stepped on arriving in Italy! Eighteen hundred years have elapsed, the "falling

away" has occurred, but the pure truth remains in a few chosen hearts.

April 28th.—And now we are on the point of entering into Puteoli, and may cross the very path trodden by Paul eighteen and a half centuries ago, when on his way to Rome. And here were brethren then.

I must not omit to mention that our visit to Naples was enlivened by very friendly attentions from many English residents.

On the 18th of May we took our passage on board the "Mongibello" for Marseilles. My husband, always alive to every object and circumstance of interest, was much struck with the near view of the mountainous and rugged Isle of Elba, as we steered between it and the picturesque shores of Corsica—one the birth-place, the other the place of exile of the first Napoleon. Lord Wharncliffe and his family were on board, returning from a tour in the East. Since then, the former as well as he whose history I now pen, have terminated their earthly career.

From Marseilles we travelled leisurely to Paris, arriving there on the 23rd of May. My husband had projected writing a small volume in French, briefly detailing the results of his investigations on the subject of the Spinal System. We accordingly established ourselves in apartments in the Rue Louis le Grand. At first we dined daily at a Restaurant, and, luxurious as is the *cuisine* of these places, there was always a little difficulty in securing a perfectly *wholesome* dinner. Day after day passed, and I observed that he did not set to work. This was so unusual with him, that at length I asked

how it was that he did not commence writing. He replied, "My dinners disagree with me, and I feel indisposed to write." The evil being detected, was soon remedied. The Restaurant was forsaken, and a plain mutton dinner regularly sent into our apartments. From that day the work commenced and made rapid progress; *within three months it was written, printed, and published,** being entitled "Aperçu du Système Spinal," and dedicated to M. Flourens. I have already alluded to the generosity and justice which ever characterized the conduct of the latter towards my husband, and to the warm gratitude which it inspired. With a magnanimity above all praise, and which will ever reflect additional lustre upon his great name, M. Flourens had publicly expressed for the scientific labours of Marshall Hall the most frank and unqualified admiration, characterizing his discoveries in the Nervous System as a "*great epoch in physiology.*"

We had much friendly intercourse with several of the Parisian physicians and their families, especially our excellent friends, M. and Madame Louis, whom we saw almost daily. The scientific character of this admirable man is before the world. His private worth and that of his devoted wife endear them to all who have enjoyed the privilege of their friendship.

Some years before this period, my husband, through the kindness of Mr. Hind, the well-known astronomer, had had an introduction to the late distinguished phi-

* By M. Victor Masson.

losopher Arago, who formed a very favourable opinion of him, which he expressed to M. Flourens, his colleague at the Institute, adding—"Il faut nommer Marshall Hall," intimating that, on the first vacancy, he should be proposed as Corresponding Member of the Institute. Arago having been dead some years, such a vacancy now occurred, and my husband's name was placed *at the head* of the list of "*presentations*" for the Institute. The celebrated surgeon M. Velpeau, in speaking of the approaching election, asked my husband how many votes would satisfy him. His playful reply was, "l'unanimité!" M. Velpeau laughed heartily. What was said in joke became, however, a reality. About three months after our return to England in the autumn, he received a notification of his election into the Institute of France. Many kind French friends vied with each other in an amiable desire to be the first to communicate the agreeable tidings, and the following paragraph appeared in the *Journal des Débats* of December 5th, 1855:—

L'Académie des Sciences a procédé dans sa séance d'hier à la nomination d'un membre correspondant dans la section de médecine et de chirurgie.

M. Cl. Bernard, au nom de la section, avait présenté la liste suivante de candidats: 1° M. Marshall Hall, à Londres; 2° M. Rokitansky, à Vienne; 3° M. Christison, à Edimbourg; 4° M. Riberi, à Turin; 5° M. Chelius, à Heidelberg.

Sur 41 votans, M. Marshall Hall a réuni 39 suffrages.* En conséquence, il a été nommé correspondant à la place vacante par suite de la mort de M. Fodéra.

His election into the first scientific institution in the

* The remaining two votes were for M. Riberi.

world, by what our friends in Paris called a unanimity of votes, was the highest reward which had ever been conferred upon my husband, and the honour was deeply appreciated by him, as an acknowledgment of the value of his labours. It forms a pleasant contrast to the treatment which he experienced from the Royal Society of his own country.

CHAPTER XVII.

RETURN TO ENGLAND—LAST ILLNESS.

RETURNING to London in September, 1855, we established ourselves there for the winter; a happy event —the birth of our first grandson—occurring soon afterwards.

A little incident at this period, though slight in itself, showed how the sensitive and affectionate nature of Marshall Hall led him to enter into the feelings of others.

Colonel Francis Seymour,* to whom he was much attached, had just returned from the Crimea, seriously wounded, after many narrow escapes, one of which, at the battle of the Alma, was thus alluded to in the interesting letter of a brother officer:—"Seymour was not wounded, but hit in the watch,† which saved his life." My husband hastened to welcome him back, greatly rejoicing in his safe return. I will, however, quote Colonel Seymour's own words:—

My dear Mrs. Marshall Hall—I have much pleasure in complying with your request that I should give you some account of my return from the Crimea, and of my poor dear friend's

* Now C.B.

† The watch was replaced by one sent out to him in the Crimea by the Prince Consort.

kindness to me on that occasion; indeed the circumstances are so engraven in my memory, that I have little difficulty in acceding to your wish. I landed at Portsmouth on the 1st of October, 1855, from the Crimea, and reached London the same day, where I found my mother and sisters, who had arrived that morning from Belgium. I had been ordered home in consequence of a severe wound in my head, from the bursting of a shell in the advanced trenches before Sebastopol, on the 24th of August previous. I suffered little from the wound on the passage home; the change of air and scene, and, above all, the prospect of again seeing my family and friends, had apparently so completely set me up, that I anticipated a speedy recovery. However, soon after my return, I began to suffer again; my wound opened, and, on examination, it appeared that some pieces of broken bone still remained, and that it would be necessary to remove them. It was at this time that your excellent husband found me out in Cleveland Row, where my mother had taken a house in anticipation of my arrival. I shall never forget his kindness to me and sympathy with my mother, whose nerves had been so dreadfully shattered from anxiety about me. We agreed to meet at the house of the late Mr. Guthrie, the case being one of a surgical nature; and Dr. Hall, with his usual consideration, thinking it better that my mother should be kept in ignorance of our meeting. Mr. Guthrie removed the broken pieces of bone from my head, without giving me much pain, and from that day the wound healed and gave me but little trouble. After the operation, Dr. Hall collected the pieces of bone, put them in a small bottle of spirits of wine, and walked with me to Cleveland Row, delighted to tell my mother that the operation had been done, and that she need have no more uneasiness on my account. My mother has since often told me that *she never can forget his look of pleasure* when he brought me back, and that it quite reassured her. . . . . You know my deep affection and respect for the one whose loss you will never cease to mourn. His was a rare mind—so kind, so gentle, so pure, so superior to

the world in general. I often think of the pleasant days I have spent at your house, and of the many acts of kindness that I have received from him.—&c. &c., FRANCIS SEYMOUR.

My husband's health had been, as I have observed, much benefited by his various travels during the two years and a half since quitting practice. He had, indeed, been remarkably well of late, and the difficulty in deglutition had not appeared to increase for many years; but now, a little before Christmas, it became much aggravated, and a new symptom manifested itself; the expectoration was frequently tinged with blood. This was, alas, *the beginning of the end!*

He was always fully occupied. Many of the poor came to him for advice, and to them he devoted the kindest attention. We must now proceed to notice several important investigations which occupied him about this time.

Soon after our arrival in London, one of those happy ideas occurred to him which alone would have sufficed to transmit his name to posterity as one of the great benefactors of the human race.

Among a vast accumulation of letters and packets which awaited him after his long absence from England, was the Annual Report of the Royal Humane Society. On opening it, he turned to the "Rules to restore the apparently drowned," and I well remember his saying—"There is nothing in this treatment to restore respiration." His active mind immediately became engaged in the subject. The researches in the Nervous System, which he had pursued during nearly a quarter of a century, had involved the physiology of

Respiration, its exciting causes and its effects. With that peculiar faculty which he possessed of practically applying principles, he soon discerned the point to be attained, and the best mode of attaining it. The means of resuscitation which he proposed for adoption in the case of the apparently drowned, will be found at the end of this volume, fully and ably explained by Mr. Charles Hunter. I will only observe that the whole subject was clear in the mind of Marshall Hall before he commenced an experiment. Many experiments were, however, performed by him and under his directions, and all confirmed the correctness of his previous reasoning. Hitherto the received opinion had, I believe, been, that after submersion of the human body for three or four minutes there could be no recovery. I well remember his saying to the Secretary of the Society—"If we take this for granted, we shall do nothing; surely it is worth while to make the effort to restore after a longer period." The result has been, that, by the adoption of his rules, restoration is now frequently effected after four times that period.

Having carefully investigated the whole subject, he wrote a pamphlet upon it, which he presented to the Royal Humane Society. He also published his "rules" in the *Lancet*, and wrote a paper on Asphyxia for the *Comptes Rendus* of the Institute. In Paris this excited attention, and his plan of treatment was copied into the *Journal des Débats* and other journals. In England it was immediately adopted by the profession generally, who took it up with great warmth

and practised it with extraordinary success. The Humane Society, however, still retain their old rules.

My husband soon perceived the applicability of this mode of treatment to the still-born infant,† and to a vast variety of other cases, and it was not long before he had the gratification of hearing, through the journals, of life after life being saved by his happy idea. These details I must, however, reserve for a later portion of his history. Another instance of his own apt application of his scientific investigations to practical purposes was manifested in the beginning of 1856.

Some lamentable cases of criminal poisonings had occurred, in which the employment of strychnia was suspected, and the skill of our ablest analytical chemists was put in requisition to detect the presence of this substance. Proof by means of chemical reagents appeared however to be sometimes difficult; contestible and unsatisfactory results alone being obtainable in certain cases.

May not the principles upon which his plan proceeds be summed up in his own words?—"The carbonic acid retained in the blood acts as a most deadly *poison*: there is ONE mode of eliminating this poison,—Respiration—and one sure mode of inducing respiration—*pronation* and *rotation* of the body."—"The quantity of this carbonic-acid poison formed is proportionate to the rapidity of the circulation; to augment the circulation, as by the warm-bath, *without* effecting the elimination of the poison by artificial respiration, is to augment the quantity of the poison, and to accelerate the death of the patient!"—"We must never forget that the circulation is a *self*-poisoning, the respiration a *de*-poisoning process. These are the two principles by which we must be guided in our treatment of apnœa." See "Prone and Postural Respiration in Drowning and other forms of Apnœa or Suspended Respiration." By Marshall Hall. Churchill.

† *Op. cit.*, p. 36; see also the *Lancet* for Nov. 29th, 1856, p. 601.

Marshall Hall was very familiar with the action of strychnia upon the frog, having minutely watched it in his long series of experiments on the spinal system. He had written two papers on this subject for the *Comptes Rendus*. It now occurred to him that the extreme susceptibility of this animal to the influence of strychnia would constitute it the most delicate test of its presence—thus substituting a physiological for a chemical test. Aided by Mr. Bullock, of Hanover-street, he performed a series of experiments by which it was at length satisfactorily demonstrated that a young frog might be violently affected by the *five-thousandth part of a grain* of strychnia! He communicated his experiments, during their progress, in a series of letters to the *Lancet*.†

Amidst all these collateral investigations, his attention was never diverted from his great subject—the diastaltic nervous system, as the pages of the *Lancet* for that period testify. Never did he cease to elaborate the extensive system which he had disentangled; its practical applications flowed in new and various directions, struck out by his productive mind, thus utilizing the riches which he had so indefatigably dug out of nature's mine.

About this time he received a letter which gladdened his heart inexpressibly. When at St. Louis, Missouri, he had conversed much and very earnestly with Mr.

† See the *Comptes Rendus* for June, 1847, and February, 1853.

See the *Lancet* for January and June, 1856. A very lucid article on this subject appeared in *Household Words*, for May 17th, 1856, under the editorship of Mr. Charles Dickens. It was about this period that the celebrated case of Palmer occurred.

Yeatman, then a slave-owner, but a man of generous feeling and much intelligence. The following letter explains the rest. It diffused a glow of joy over my husband, who regarded it as a first fruit of his earnest labours in the cause of emancipation :—

St. Louis, Missouri, January 15th, 1856.

Dear Sir—While you were in our city, you took great interest in the subject of slavery, and I have often thought of the views expressed by you with very great pleasure.

The slavery question since then has become one of even greater interest than when you were here. Fanatics, north and south, have both been pushing their peculiar views with a tenacity worthy of a better cause. The result has been that the poor negro has suffered in the contest. Stringent laws respecting the liberation of slaves, and respecting free persons of colour, have been passed in several States. . . . .

Since you were here, I have liberated all my slaves. They had served me faithfully, and were *prepared* to appreciate and enjoy the freedom which I have given them. They have now been freed something over a year and a half, and have so far succeeded in supporting themselves.

With their freedom I gave them all the necessary furniture to commence housekeeping, with clothing, food, and fuel for several months. With this assistance they have accomplished all that I could wish for.—I remain, most respectfully, your obedient servant, JAMES E. YEATMAN.

He wrote to his old friend, Mrs. Fletcher, sending her a copy of his little work on "The Twofold Slavery of the United States." The reply of this admirable lady is so interesting and so characteristic of her, that I cannot refrain from inserting it. Written at the age of eighty-six, it displays the enthusiasm of youth, and a zeal in a noble cause which years could not quench.

This letter so delighted my dear husband that he carried it constantly with him, showing it to every friend he met, with expressions of unbounded admiration:—

Lancrigg, February 25th, 1856.

My dear Dr. Hall—You have done me much good in sending me your little book on American slavery; you have cheered me with the hope of emancipation.

More than sixty years ago my husband was a zealous and efficient member of the Abolition Society, and we were often gratified with having Thomas Clarkson an honoured guest at our table; since that time I have never ceased to take the deepest interest in the subject. I remember well Dr. Dixon, who had spent many of his early years in our West Indian Islands, telling us that at that time an excellent practice was introduced in Barbadoes by some humane slave-owners; they allowed their industrious slaves to buy one day in the week (say Monday); out of the profits of that free labour day they were soon able to purchase Tuesday, and in a short time became master of the whole week; but I do not remember that any care was taken of the education or moral condition of the slave.

I hope it may please God to make your truthful and persuasive book a Magna Charta to the Slave States of America.

The emancipation of the *free slave* from their stupid and barbarous injustices will be more difficult. Since the year 1833, when I saw a good deal of Elliot Cressen, I became a zealous admirer of the Liberian scheme, but you have convinced me that it will be wholly inefficient to cure the great evil. Instead of abolition societies in our great towns, I think there should now be self-emancipation societies, to co-operate with those which I hope are already formed in the United States. In putting this hope into my heart, I repeat it, you have done me much good.

And now tell me much about Mrs. Hall and your son. Tell me all about the latter, for on his welfare and happiness

I know so much of *yours* and his mother's happiness depends. You will be glad to hear your old friend has passed her eighty-sixth birthday with *less* infirmity of mind and body than commonly accompanies that age.

I have innumerable causes of thankfulness. My children and grandchildren are all good and prosperous. I have eight grandchildren, the delight of my old age. My daughter Mary has prevailed on her excellent husband* to make Lancrigg his future home, and I am thus relieved of all household cares.

I seldom write now with my own hand, it occasions so much *heat* of head.

Remember me most kindly to Mrs. Hall, and believe me to be yours, faithfully and gratefully, ELIZA FLETCHER.

In June we visited our friends in Nottinghamshire, and one day in accompanying his nephew, Mr. M. H. Higginbottom, through the General Cemetery, my husband suddenly stopped, and, facing the north, said,—

If I could shoot an arrow before me so far, it would go over the old house at Basford; and when I do depart, I should like to be buried here. Will you see that this is attended to? In a few days I will send you the inscription which I wish to be on my tomb, which I should like to be of granite, and simple.

He visited the Arboretum at Nottingham, and much admired both it and the Cemetery. The immense extent to which the town and its environs had increased astonished him, and he was pleased at the prosperity which it indicated.

The following letter to Dr. Webster, of Dulwich, will explain some of his projects at this period:—

Sneinton, near Nottingham, July 3rd, 1856.

My dear Friend—We have been in this quiet spot one

Sir J. Richardson, the Arctic explorer.

month, and have much enjoyed the green fields and the beautiful Trent. We purpose going to London for a week or two on the 14th ; then to some sea-coast, perhaps across the Channel, and then to return for the winter.

We still sometimes think of planting ourselves near the Crystal Palace, in some cottage with a garden, and looking south-west.

This is all I know about ourselves. What do you say of your plans? Where are you now? What are you doing?

I intend, D.V., henceforth to occupy myself with preparing my "Diastaltic Nervous System," in a condensed aphoristic form, for the press, and to devote myself to the STUDY of the Greek and Hebrew Testaments, searching out the parallel between them, and studying every word distinctly.

Perhaps I may also write "Elements of Physiology." So you see I shall not be idle.

Let us hear from you. United kindest regards to you, Mrs. Webster, and all yours.—With every good wish, believe me, your attached friend, MARSHALL HALL.

A few weeks were now spent in London, during which he wrote the following interesting letter to the *Lancet;* the case is one among many in which his suggestion of tracheotomy was eminently successful:—

NOTE OF A CASE OF EPILEPSIA LARYNGEA, TREATED BY TRACHEOTOMY.

BY MARSHALL HALL, M.D.

To the Editor of the LANCET.

London, July, 1856.

Sir—I have just been witness to a scene which has much gratified me—that of the grateful expressions of a mother for the restoration of an only son from a state of epilepsy, mania, and idiocy, the effects of frightful seizures of *laryngeal* epilepsy, by tracheotomy.

The case will shortly be published in all its details by Dr.

Ogle, of St. George's, to whom society is immediately indebted for this benefit. I can only send you a few brief particulars, communicated to me by the patient's mother, a poor washer-woman :

The patient, aged seventeen, became seized with epilepsy from fright *six* years ago.

The fits became gradually more and more frequent, and more and more severe, until about a year ago, when they recurred many times, indeed almost incessantly, every night, and frequently in the day, especially when he fell asleep, with blackness of the face, bitten tongue and bitten thumbs, convulsions, stupor, mania, idiocy.

On last Christmas-day, and again on "Boxing-day," it became necessary to put on the poor patient a strait waistcoat. It was next proposed to send him to a lunatic asylum. His fond mother, however, retained him at home, passing a great part of every night in watching him, and restraining him from convulsive and maniacal violence.

Two months ago, tracheotomy was ably performed by Mr. Holmes, of St. George's. The relief was almost immediate; for a day or two the boy suffered from slighter fits; but from that time he has had no night fits, no "*black*" fits, no fit with bitten tongue and thumb, no convulsion, no loss of consciousness—nothing, in a word, except slight and transient faintishness !

His mind is restored from its idiocy, his physical health and strength are improved, and there is now, for the first time in his life, the question of some useful occupation for him !

The tube is worn without pain or inconvenience. It is kept free from mucus, being managed entirely by the patient's mother. The patient himself places his finger on its orifice whenever he wishes to speak.

The poor mother's joy is extreme, and her expressions of gratitude know no bounds; and I confess that my own reward in having, by the suggestion of tracheotomy in this special form of epilepsy, *so far* rescued a fellow-mortal from

a state the most deplorable of mind and body, is of the highest kind.

I must add, that the selection of the case for the operation by Dr. Ogle, who is paying special attention to the subject of epilepsy, was most judicious.

In August we visited some kind friends at Tunbridge Wells, and afterwards spent a few weeks at Folkestone, Boulogne, and Hastings. Dr. Hall's deficient power of swallowing now began to interfere with his receiving adequate nourishment. Yet he was active, mentally and corporeally, always cheerful, often playful, and interested in the simple pleasures of the country. He loved to stroll beside a bank, searching for ferns and wild flowers, watching insect life and observing everything. Some chemico-agricultural schemes often occupied his thoughts, and had he resided in the country, there is no doubt his originality would have been brought to bear upon that subject. He had often wished for an opportunity of trying various experiments in agriculture which had occurred to his mind. His diaries for this and the preceding year were full of suggested inquiries, not only in physiology, but also on a vast variety of subjects.

Our visit at Boulogne, in August, was made in order to see an old and dear friend, a great invalid, and about to proceed to Paris for the winter. With this lady my husband conversed much about a future state. He spoke of his salvation through the merits and mediation of his Divine Redeemer, and said, quoting some passages from Scripture, "I strive also for a *crown*, and I hope to obtain one of the brightest."

He then alluded to the persecution and obloquy which his simple adherence to the law of Christ had brought upon him, mentioning many instances. After discoursing of purely spiritual things, in reference to the life which is to come, he added, that he looked forward also to the enjoyment to be derived from perfectly comprehending all the wonders of creation—those mysteries which human investigation had never been able to unravel, saying, however, "But of this we know nothing," for he did not approve of adding any imaginations of man to the truths revealed in the Holy Scriptures. To the same friend he also said, "I enjoy life; I have a great deal yet to do; but I am ready to go—*quite* ready!"

Whilst at Boulogne he had frequent conversations with the Superintendent of the *Société Humaine*, relative to the means employed for the resuscitation of persons taken out of the water; and the experience of the Superintendent distinctly confirmed the fact of the danger of the warm bath in such cases.

Both at Boulogne and at Folkestone, my husband suffered from disordered digestion, and was disinclined to take food. This was just the period when diphtheria first made its appearance. While at Hastings, he complained of sore throat. Many of his relatives, to whom he had always been most affectionately attached, were at the latter place. With them he enjoyed long walks, outstripping all the party, of whatever age, in the rapidity of his pace. His cheerfulness was unabated; in fact, he was, as usual, the life and joy of the circle, entertaining all by the play-

fulness of his conversation. To these dear friends he also talked much on religious subjects, and they were profoundly impressed by the simplicity and the earnestness of what he said.

About the end of September we went to London, intending to establish ourselves there for the winter. The season was very rainy; he was unfortunately exposed to wet, and caught cold. A severe bronchitis with laryngitis, ensued, and greatly aggravated the difficulty of swallowing. On the 29th of September he wrote as follows to his nephew, Mr. Marshall Hall Higginbottom, at Nottingham :—

Your father will tell you how distressing my dysphagia has become, and, I think I must add, how almost hopeless. How precious, in this view, is the *pure*, the *simple* doctrine of Christ!

A few weeks afterwards he addressed the following letter to the same gentleman :—

4, Hanover Street, Oct. 20th, 1856.

My dear Nephew—I have been suffering very much from pharyngitis and its symptom dysphagia, and have lost much flesh. You remember I told you of the exfauciation of blood, for so I think I must call it. Whither will this lead? Whether I recover or not, I have become, I may truly say, very familiar with the thought of death; and under this impression all my views of the truth are only infinitely more vivid and bright than ever.

On the same day he wrote a second letter to the same relative, saying :—

I forgot a principal part of my letter.

When I do depart, I wish you to go to the General Cemetery, taking Marshall with you, and to select a spot in the highest

part, looking towards what were the Basford Works. Then I wish a plain and simple monument or tomb to be erected, made of granite and bearing this inscription. . . . .

Do not refer to either of these two letters when you write. —MARSHALL HALL.

A letter on the 28th of October contains the following paragraph:—

I shall be rejoiced to hear from you on the most important of all topics. Such I have, for thirty years at least, considered those of our recent conversations, such I consider them especially at this moment!

My medical advisers fear ulceration about the larynx or pharynx.

For many years he had entertained an earnest desire to visit Jerusalem and Egypt. The former had been given up for some time as involving too much fatigue; but the latter was still looked forward to at some indefinite period. Some friends were now about to proceed to Egypt for the ensuing winter, and much pressed our adopting the same plan. Mr. J. N—— most kindly offered to facilitate our travelling, and we half entertained the project. I confess I fondly clung to the hope of relief to my suffering invalid from the climate of the Nile, and it was with a pang that I renounced, by the wise advice of medical friends, a project which had appeared to me to afford almost the only chance of relief. Whenever a fog or any unfavourable, chilly weather occurred—and how constantly do these recur in an English autumn!—the distressing symptoms were invariably much aggravated.

I now quote an extract from an account of his case subsequently drawn up by his friend Mr. G. D. Pol-

lock, of St. George's Hospital. In speaking of the events of October, this gentleman says:—

He had some time ceased to partake of solid food; milk, cream, and coffee were the fluids he chiefly preferred. He was seen in consultation by Dr. Williams, Mr. Cæsar Hawkins, Mr. (now Sir) J. R. Martin, and myself, all of whom were agreed as to the serious nature of the complaint. He was quite prepared for the expression of their most unfavourable opinion, and was even cheerful whilst under examination. In speaking to one of his medical friends,* who was constantly with him whilst in town, he said, "I don't ask you what your positive opinion is as to my prospect of life, for no one can be certain of the result of a hidden malady, but I look upon my disease as a fatal one, and have long done so. I have no hope of recovery. I don't wish you to mention this to Mrs. Hall. I have no fear of death, and cannot be alarmed by the truth. My only wish to live is for the sake of others; but I am resigned to the alternative, if it be ordered that I should not live much longer." The calm, resigned, and almost cheerful manner in which he spoke, at once showed the preparation and the courage of a man who knew his end was not far distant, though still, as ever, unselfish, considerate, and affectionate, for those dear and near to him.†

In regard to his wish that I should not be alarmed —he had witnessed the agony which the first idea of his danger caused me; and when he found that my fears were replaced by hope, it appears, from all that I can learn, that he could not bear to see my happy delusion dispelled. Indeed, I believe he apprehended some dire attack of my health if deprived of hope.

About this time he frequently saw some young

* Mr. G. D. Pollock himself, who was unremitting in his kind attentions.—C. H.

† The *Lancet* for Sept. 5th, 1857, p. 254.

medical friends of St. George's Hospital. One of these, Mr. R. L. Bowles, says, in a letter to myself:—

It is a real pleasure for me to feel that I was honoured by the friendship of your husband. I shall ever look back to our evenings in Hanover Street as a bright spot in my existence. His wonderfully original and suggestive mind, no one could fail to observe who had known him even for a short time; but perhaps his domestic happiness was not so known to the world. I well remember that, in some conversation about his case, he confessed to me that he knew its bad aspect, and told me many symptoms—how that in a fortnight he had lost many inches of size, that he felt weaker, that his throat affection was increasing, and summed up by saying that he knew his time was but short in this world. He then charged me most strongly not to arouse your suspicions, and to say nothing that would distress you. I am sure none knew how many of his doubts and fears about himself he kept from you for fear of wounding you; his calmness and self-possession on the subject struck me most forcibly, and not less so did his patience and resignation.

The following deeply affecting letter was written to a friend about this period:—

4, Hanover Street, Oct. 25th, 1856.

Many, many thanks for your kind note, so like yourself. Mrs. Hall is gone into —— Street, and I seize the opportunity of writing you a line to say that I have just expectorated more blood than before. I do not know what its source is, nor what it portends; but I can say, "to me to live is Christ, and to die is gain." Only I think of some I may leave behind. I charge *you*, dear Miss ——, when (I do not say *if*) I am called away, be *very kind* to her to whom my heart has been wedded, as never heart was, in Christ, for more than a quarter of a century.—Every good attend you all. Ever very sincerely yours, MARSHALL HALL.

P.S. Your visits always cheer us.

Ever since, as well as before, his retirement from active practice, his door had always been open to the poor who sought his advice. Not a morning passed without his receiving many of the humbler classes, and, I may add, many also of a higher grade of society, from whom he would take no fee, if he thought it could not be well afforded. All these received from him the kindest attention and were always invited soon to repeat their visits. Many such continued to call during the suffering period which I have been describing. He would not allow them to be denied access to him, but insisted on seeing them and giving them his usual attention and advice. This was the case even when confined to his bed, and when, on account of his laryngitis, he could only speak in a whisper. To save him as much as possible from effort, I generally saw these patients first myself, and begged them to cause him as little exertion as possible in speaking.

It is wonderful that even at this period, aware that he was balancing between life and death, he yet wrote a paper to be read at the *Harveian Society*, on inducing respiration in the still-born infant, by means of his postural method of treatment.

It was thought desirable that he should quit London before the season when fog is apt to occur; early in November, therefore, we removed to Brighton, intending to proceed to Hastings before the spring. Unfortunately, he caught cold on the journey and kept his bed nearly a week, affected again with bronchitis. When this attack had subsided, he ventured

out, and on the 10th of November wrote to Mr. E. Hoblyn, "I have enjoyed the air to-day. But most of all I rejoice in Christ Jesus."

The following is an extract from a letter addressed to his nephew, Mr. M. H. Higginbottom, on the 13th:—

On Sunday last I saw Mr. Cæsar Hawkins here. He does not change his opinion of my case, which is unfavourable. However weak the flesh may be, I can say, in the spirit, "Lord, Thy will be done!"

About the same time he wrote a distinct detailed account of his case to his friend M. Louis, of Paris. Speaking of the irritation sometimes caused by particles of food remaining in the pharynx, he adds:—

C'est pour cela que je ne mange plus; j'avale seulement beaucoup de lait et de crême mêlées avec un peu de café, ou avec du bouillon bien fort.

Je suis maigri sous les accès de bronchite, mais pas autrement, au moins pas bien perceptiblement; mon pouls n'est pas augmenté dans l'état de repos; et je suis tout-à-fait content de mon régime; de sorte que je dis souvent que j'ai toujours deux "comforts"—la meilleure des femmes et mon bon café!

In the ensuing pages I have thought it right to quote a great number of letters containing minute details and therefore constituting the history of my beloved husband's last sad illness, on account of the importance of throwing every light upon a case of such great interest.

On the 22nd of November, he wrote the following account of his case to Mr. G. D. Pollock:—

Fifteen [it should have been *eighteen*] years ago, I was induced to give *two* long courses of lectures on the Practice of Physic in the same season. For six months I gave an hour's lecture at six and at eight o'clock p.m. !

I became rather hoarse, and Mr. Guthrie said I had the clergyman's throat.

About this time,—a little later,—I began to perceive that minute portions of food remained in my pharynx; *of these* I occasionally raised one or two; others most probably found their way into the stomach. Sometimes I have raised particles of food about five or six o'clock *a.m.*

Before this I had some affection of the larynx, a little huskiness of voice, &c. &c., and some *choking* in swallowing food.

A year ago, I first perceived a little expectoration of blood, not every day, but occasionally, and by degrees more frequently. I often perceived this during dressing; sometimes during walking; frequently after much speaking.

More recently my dysphagia has greatly increased.

[The letter then proceeds to the consideration of medical questions connected with the throat. The terrible idea of scirrhus is discussed, and somewhat questioned. He proceeds:—]

My throat is most susceptible to the impression of cold; the north wind, or the fog,—and we have had both in too great abundance,—induces a feeling of stinging about the rima glottidis, and the appearance of blood. I am always best and *seem* to make progress, in these respects, when I keep in bed for a day or two. I think a genial and warmer climate might do me good; but the travelling to attain to it would do me harm. I sometimes think of establishing a stove-warmed atmosphere, supplied with moisture. What do you say to this? Our large drawing-room in Manchester Square, from being the chilliest, and almost uninhabitable in winter, became perfectly delightful by this means.

Sir B. C. Brodie passed the stomach-tube into my stomach

nine or ten years ago, and found nothing. But of course the symptoms which *suggested* stricture existed at *that* time. I exhibited the effect of attempting to drink *cold water*, which has *always* induced my spasmodic dysphagia, in the most marked manner. . . . .

I have neither chills nor acceleration of the pulse.—I am, my dear Mr. Pollock, your most grateful patient, MARSHALL HALL.

To his brother-in-law he says, in a letter of November 23rd :—

I am certainly better, both as to pharynx and generally ; but not *to-day ;* for the wind blows keenly from the north, and I ventured to the end of the pier, which I had no sooner done than I expectorated a little blood, and ever since my throat has been more irritable than usual. This is always the effect of exposure to cold. My susceptibility to cold and damp is quite extraordinary. I have sometimes thought I would prepare a *stove-warmed* room and live in it, D. V., until May. Warmth benefits me whilst cold destroys me.

A letter to Dr. Webster, of Dulwich, dated the 29th of November, contains the following affecting passage :—

You have *heard* of "the valley of the shadow of death ;" I have passed through it. My Saviour shone in my heart, as the sun in his strength ; but still I could not think of ties of love and affection and friendship being sundered, without feeling that whilst the spirit may be willing the flesh may be weak.

On the 3rd of December he wrote to Mr. Hoblyn :—

It is just a month since we came here. It is impossible to be more comfortable in lodgings than we are. Still I do

not think the change here has been of any advantage except in insuring quiet.

We were now established at 37, King's Road, the situation having been chosen as somewhat screened from the winds. The kindness we experienced from the amiable mistress of this admirably conducted house, and from her excellent servants, could not have been exceeded. The dear invalid's gentleness and consideration to all around him soon won every heart; and I may truly say that in this comfortable house we were, from first to last, treated more as friends than as lodgers, the constant lamentation of our good hostess* being that, on account of her blindness, she could do nothing for him with her own hands.

The fact that, wherever we went, all regarded him with *affection*, is perhaps the strongest proof of the sweetness of his disposition. Indeed his unselfishness, his ever active benevolence, which made him studious of the good of all; his kind, simple, and often playful manner, could not fail to prepossess strongly all who came within his sphere.

It was his natural temperament to be cheerful; but doubtless his habit of constant occupation conduced also to this happy state of mind and spirits; and above all, he had "peace and joy in believing."

Ever since the middle of October, his sole sustenance had been milk, of which he, at first, took nearly five pints daily in coffee, and occasionally a little strong

* Since dead.

beef-tea, or essence of beef; but as the latter often caused irritation in the throat, it was not persisted in. With this poor and unvaried diet he was quite content, never uttering a word of complaint. His mind was as clear and vigorous as ever, and his pen constantly at work.

He was still much occupied with the subject of respiration, as connected with resuscitation, and he now corresponded with Mr. Bullock, whose accurate preparation of the gases, &c. was very useful in carrying on some experiments suggested by Dr. Hall from time to time.

His *great* subject, the Diastaltic Nervous System was *never* laid aside, and during December and the first part of January he wrote *five* papers upon it, which were published in the *Lancet* of those months. He also adopted some measures to make known his plan for the Sewerage of London.

Yet he found time to write letters and papers on a great variety of subjects. The following was addressed to our son about this time:—

I have been thinking of the experiments: a given portion of soil must be put into each of a dozen tiny flower-pots; a given number of seeds are to be placed in each; germination and vegetation are to be watched, severally, under the influence of watering with, 1. Dilute pure Ammonia; 2. Carbonate; 3. Sulphate; 4. Muriate; 5. Nitrate of Ammonia (the quantity of ammonia being the same in each and all); 6. Carbonic Acid; 7. Sulphuretted Hydrogen, &c. &c.

The results *must* be interesting, must be valuable. We must also try experiments with the *same* soil, seeds, &c., watered with pure water, but placed in different gases, as dilute

carbonic, ammonia, nitric acid, &c. &c. Another point will be the influence of temperature. The series will be unique and the event certain. The occupation will become deeply interesting as the results become valuable. Your own idea of the analysis of soils will also be valuable. I would devote a few years to these investigations. You will then have a certain scientific standing which few agriculturists can attain to; and it will add to your utility and bring its reward; only all must be done with steadiness and perseverance.

Our united kindest love to Mary, the boy, and yourself.—Your most affectionate father, MARSHALL HALL.

P.S. Most of M. Boussingault's experiments were performed on a small scale, and proved by accurate weight and measure; and he stands highest among the authorities on this subject in France. Have you Dumas' and Boussingault's little (but great) work with you?

In a letter to Mr. C. Hunter, he playfully reverts to his plan for preserving the sewage to fertilize the fields:—

Do you know *why* I am so anxious about my plan for the sewerage? If all the still-born, which used formerly, for the most part, to remain *still*, are now to *live* and *move*, I must e'en provide for so large an addition to the population! And *so*, I am of course called upon, as it were, to cause "two blades of grass to grow where only *one* did before!"

He now proposed to write a series of "Essays on Physiology" for *The Lancet*, and actually made a commencement; this work, however, he was not spared to accomplish. Had it been otherwise, its importance would indeed have been great, for it was his intention to treat the subject completely and *ab initio*.

On the 29th of December, in writing to his nephew, he says:—

I trust you had all a merry Christmas, and that it will be followed by a happy year and happy years. I wonder what the events of 1857 will be! God knoweth, and in Him is my perfect trust.

The following is a letter which he addressed to M. Louis on the 2nd of January, 1857:—

Mon cher Ami—Je suis cité dans quelque roman comme ayant dit—"Le meilleur tonique c'est le bonheur." Ce tonique vous avez su, mon ami, me l'administrer.

Il y a déjà deux mois que nous sommes à Brighton. Dans quatre autres mois nous aurons l'aimable Mai, et alors je compte venir vous voir, vous et Madame Louis, avec ma femme, et vous raconter de vive voix tout l'effet sur nous de vos deux dernières lettres. . . . . Quelle joie j'éprouve à vous sentir tellement mon ami—et quel orgueil!

Nos enfants se portent bien, et notre petit-fils est une merveille. Il a un sourire pour tout le monde. C'est vraiment un cygne que *notre oie!*

Nous faisons mille vœux pour vous et Madame Louis. Vous savez comme nos cœurs sont à vous, et je n'ai presque pas besoin de répéter comme je suis votre dévoué ami.—MARSHALL HALL.

I now quote a portion of a letter dated January 4th, in which he speaks of his own case:—

My dear Hunter—I much wish your father and you would read the enclosed letter. It will give you a distinct idea of my case, which *I* believe to be ulceration of a common kind at the posterior part of my pharynx, with surrounding inflammation. I am certainly better, and have decidedly gained strength and fat. . . . . The ulceration was produced, I believe, by little portions of food long remaining in my pharynx, from a peculiar dysphagia.

In another letter addressed a few days later to the same gentleman, he says:—"I hope you will long

remember our short acquaintance, as not without its utility to you." This allusion to the shortness of their acquaintance points unmistakeably to his belief in its approaching termination by death.

In the previous month of December he had written to this young friend:—

How shall you occupy yourself during the coming year? I mean on what subject? *Always* have a subject. [In January, after proposing an investigation, he adds:—] but do nothing without consulting your father. He is wiser than *we young enthusiasts.*

You should take up some worthy subject for investigation yourself, *now*, that is, *before* you become engaged in the actual practice of the profession. What do you say to this? And what does your father say to it? If you do something well, it will stick to you through life as a matter of reputation. Shall I suggest a subject?

[Another letter commences]—I want to propose to you a professional *inquiry* and *career*. [Then, after making some remarkable suggestions, he winds up his letter thus:—] Here is work for *cautious* trials for a life.

[On one occasion he says:—] My dear Hunter, I think very highly of your "thinking." Without thinking, no man ever did anything

It will be obvious to the reader that he felt a lively interest in the career of this intelligent young friend, om he wrote a series of letters replete with tant suggestions and remarks. I have already d to the zeal with which he endeavoured to

another occasion he writes:—"Hysteria is real, fictitious, and exaggerated, at the same time. It is a labyrinth to unravel. It is *caused* by emotion, and it induces emotion; it is intestinal, uterine, and *rarely* attends real disease; on which, however, it may supervene, as debility or exhaustion supervenes.

incite ardour for original investigation in members of his profession, and more especially in the younger ones. His constant habit of deep thought and acute observation suggested a vast variety of subjects, which he took pleasure in laying before them for their prosecution, striving to inspire them with his own enthusiasm. He delighted to find an inquiring mind, and always most patiently and good-naturedly answered questions and gave full explanations.

He heard that a medical friend was ill and laid aside from the practice of his profession—a great misfortune to a young man whose prospects in life were mainly dependent on his own exertions, and the trial was rendered greater by his being a married man. He felt much for this gentleman and wrote to him on the subject of his complaint. The reply showed that this sympathy was appreciated, and, in thanking him for his kindness, contained the following remark :—"I have consulted many, but, somehow or other, few will *go into* the case, or *probe* it, as you have done."

This "probing" of a case was indeed one of his characteristics, as all know who came under his care.

Perhaps the most simple and truthful picture of him at this period is afforded by a brief account contained in one of my own letters to our daughter-in-law, which being written at the time, though hurriedly, exactly represents the facts as they then were :—

He is always a perfect pattern of patience, always usefully occupied, writing and thinking a great deal. He has derived great pleasure from the success of his method for the treatment of the asphyxiated. Fresh communications are addressed

to him almost daily, relating the success of the plan in regard to the *still-born*, besides some recoveries after immersion (drowning), and one recovery from dying from chloroform, &c. &c.

I believe the pleasure your father has experienced from this has done him good. He himself, you know, is quoted by some author as having said, "Happiness is the best tonic."*

He is likewise energetically pursuing his benevolent labours in behalf of the poor Negro.

Besides all this, he is writing some papers of great value and interest in *The Lancet*, on the Nervous System, and one for the *Comptes Rendus*, on Asphyxia.†

His anxiety for the self-emancipation of the slaves in the United States continued to be most ardent. He talked of it with enthusiasm to every one with whom he came in contact, endeavouring to inoculate them with the feeling which warmed his own heart. A lady who frequently called upon us, was much struck with his resemblance, in this respect, to Wilberforce, whose biography she had just been reading. Another friend, who also most amiably sympathized in everything which interested him, has recently told me that the last words he said to her in parting were, "Do not forget my poor Negroes." I can truly say

* Since writing the above, I have been much struck with the following sagacious observation in Miss Nightingale's "Notes on Nursing," p. 58, which was signally verified in the case of my dear invalid:—"A sick person intensely enjoys hearing of any *material* good, any positive or practical success of the right." "Tell him of one benevolent act which has really succeeded practically,—it is like a day's health to him." To this true remark I would add that if the "material good"—"the positive and practical success"—be produced by the sick person's own benevolent labours, his pleasure is increased *a thousandfold.*

† Besides the five communications to the *Lancet* of this period, on the Diastaltic Nervous System, he also wrote *six* letters to that journal, on the various applications of the Ready Method, setting forth the *physiology* of the treatment.

that his benevolent desire to give freedom to between three and four millions of human beings occupied a great portion of his thoughts, and the more he considered the subject, the deeper and the stronger was his conviction that *his* plan was the only safe and feasible one; that it would one day be adopted was his firm belief. He wrote several letters to some of the "Society of Friends," who have always been active abolitionists. In these letters he earnestly pointed out the dangers and evils which would infallibly attend *unprepared abolition*. About this time also, a communication from him relative to this subject was inserted in the *Plymouth Journal*.

Mrs. S——, with a view to amuse my dear husband, kindly lent him "Rogers's Table-talk." In it he met with those touching lines by Mrs. Barbauld, which I subjoin. He was evidently much struck with them, and copied them into his memorandum-book. Doubtless they expressed many of the feelings which often filled his heart:

Life! we've been long together,
Through pleasant and through cloudy weather;
'Tis hard to part when friends are dear;
Perhaps 'twill cost a sigh, a tear;
Then steal away, give little warning,
Choose thine own time,
Say not good night, but in some brighter clime
Bid me good morning.

The following paragraph formed a postscript to a letter which he addressed about this time to the Rev. Dr. Bartlett, Rector of Everleigh, Wilts:—

During those three days and nights, I thought of all ties of

love, affection, friendship, sundered; but Jesus, the Christ of God, and my Redeemer, Saviour, King indeed, shone in my heart as the *sun* in its strength. How should I feel towards the man who should at this moment dispel *all* my fears relative to my health? Well, that feeling would be faint indeed compared with my glowing love to Christ!

We were expecting a visit during March from our son, his wife, and our grandson. This was a subject of delightful anticipation. My husband seldom ventured out of doors, only when the weather was most favourable, and then he walked at so rapid a pace that I had difficulty in keeping up with him. One day he was missing! On his reappearance, the mystery was explained; he had been paying a visit to a neighbouring toy-shop for the purpose of inspecting certain little wooden spades and waggons, baskets, &c. &c. I need not say what was then so pleasantly occupying his thoughts; not the Diastaltic Nervous System, not the sewerage of London, not even the gladdening success of his "Ready Method," nor yet "my poor black people," but a dear little being, whose happiness he was intent on "the ready method" of promoting to the utmost. The expected visit was, however, postponed, on account of the extreme cold which supervened, and when the dear child did arrive, his fond grandpapa was, alas! too ill to enjoy his society for more than two or three minutes at a time.

I remember another little occurrence of a similar kind, which shall be related in the words of Mrs. S—— herself:—

I never shall forget one day going with my little boy to

call on you. At the sight of the child Dr. M. Hall started up, and off he ran with him to the first toy-shop to procure a spade for him. The manner in which he entered into the child's delight was something exquisite; I never can forget his bright expression of sympathy with the youthful feeling. Sometimes I met him venturing out for a little walk; without saying one word he would make me take his arm, and, after walking for a short time, he would run in as briskly as a boy. I never saw any one whose face more shone with kindness and sincerity. When in Brighton during the month of February, I saw more of the dear Doctor than I had ever done before, and it was only to know him to entertain an affection for him.

I now pursue the painful history of his sufferings. In January he had written to Mr. Pollock:—

I have been two months at Brighton, and the complaint has made no progress; but in cold, foggy weather my dysphagia is always worse. I am intensely susceptible to cold. I have been many days lately without blood in the expectoration; but last night it came on, after going to bed, without any assignable cause. Everything I take is apt to leave particles in my pharynx, even a light-boiled egg. Hence the cause of the irritation and consequent ulceration there. If so slight a thing will irritate and produce exudation of blood, there is surely ulceration there, and this, in fact, has all along been my opinion.

The last week in February was a very suffering, because a cold one to my dear invalid; but the weather improving, he was able to swallow a very little solid food *occasionally*, and on the first of March he much enjoyed a small portion of roast mutton and spinach.

The following particulars are extracted from the note-book of Mr. Wildbore, who kindly saw him almost daily:—

There was at all times, in a greater or less degree, "a stinging, burning pain" behind the larynx; sometimes for a day or two it was absent. During February the symptoms were variable, the dysphagia increasing as the temperature became colder. Once or twice there was slight regurgitation of fluid by the nose and mouth. Some considerable benefit was derived from sipping a solution of chlorate of potash in water several times a day, with marked temporary benefit to the swallowing, but the effect was not permanent.*

In March he had a severe attack of gout. This was relieved by small doses of potash sipped in water, and also used in an enema. The dysphagia slowly but gradually increasing, four pints only of milk were now taken in the course of the day, and it occupied nearly half an hour to swallow half a pint.

On account of the exasperating effects of cold, we had looked forward with great apprehension to the month of March; it commenced mildly, however. On the second he wrote to Mr. Pollock, saying:—

It is just sixteen weeks since I left you to come to Brighton; and I think I am, as nearly as may be, *in statu quo*. In regard to *muscle*, I am thinner; in regard to fat, I have gained a little. I have spent all this time pent up in two rooms, with only a short walk of fifteen minutes occasionally recently, and I have taken no solid food whatever, with still rarer exceptions. [The suggestions of taking food by means of a very flexible tube, passed down the throat, a little beyond the pharynx, and the application of the nitrate of silver, are then made. He proceeds:—] Now, my dear Mr. Pollock, think well of these views and give me your opinion early. Take the view of it which a General would do of his enemy—in order to plan an attack.

I must tell you how much I am indebted to you for kindly introducing Mr. Wildbore. His kind attentions to me have been unremitting and most valued.

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* See the *Lancet* for Sept. 5th, 1857, p. 254.

I trust you and all yours are well. *We* send you our best wishes and kindest regards,—and I am ever your most grateful patient, MARSHALL HALL.

P.S.—Have you ever seen such a case as mine, in its history, its symptoms, its effects? I do not mean vaguely (as we Doctors are apt to speak) but *accurately.*

To Mr. Higginbottom, at the same date, he says:—

It is sixteen months since I first observed that I occasionally raised a little blood.

I enclose you a little drawing made by a young friend of mine [Mr. C. Hunter]. You will see that it is a sketch of my throat with its superficial ulcerations. Others doubtless exist lower down—and one, I think, especially, just out of sight, judging from the stinging pain I experience—perhaps more extensive and deeper.

I passed a painful week of dysphagia, last week. I once thought of asking if you were too busy to come and inhale the pure air of Brighton for a few days and see me. But then I thought it would do me no real good.

About the 9th of March very severe cold set in, the effect of which was, as usual, to produce bronchitis, and to aggravate the dysphagia to a most distressing degree. Mr. Higginbottom came to pass a few days with us, and on the 10th, in his presence, my husband himself passed a gutta-percha tube into the œsophagus. In doing so he experienced no pain, but a slight obstruction, opposite, as he said, the first or second portion of the sternum; the tube, however, passed through the obstruction.

On the morning of the 12th, he was utterly unable to swallow any kind of food. An attempt was made to introduce milk into the stomach by means of the tube which he passed down the throat *to* the obstruc-

tion, but not *through* it. This was unsuccessful; the milk returned, and the experiment was not repeated.

Never can this terrible day be forgotten. Complete inability to swallow any sustenance is a condition awful enough to appal the stoutest heart. Calmly and without a single complaint was it endured by my husband. With his usual intrepidity and presence of mind, he himself directed the operation of introducing the milk by means of a funnel attached to the tube, Mr. Higginbottom and myself being the sole assistants.

Unshaken by the fearful circumstances of this sad morning, with a craving hunger which could not be appeased, and a burning thirst which there was no possibility of assuaging, he manifested his usual consideration for others, and I well remember his insisting on my going downstairs to take my luncheon at the usual hour. Unknown to me, he said to Mr. Higginbottom, "I shall die of inanition." Early in the morning he had written, from his bed, the following letter to our son :—

The weather is severer than ever! I would on no account expose your dear boy to it.

As to myself, I find it this morning absolutely *impossible* to swallow even a little milk flavoured with coffee, and I am going, as soon as breakfast is over, to try the tube. Your mother explained, in her letter of yesterday, that when, on Tuesday evening, I passed the tube, I came to an obstruction. I own the shock to my feelings was great. This I know—Whatever *is*, is right.

I now wish you, when the weather is a little milder, to come over yourself. In any case it will be well that my house

should be set in order. And you will only learn a little the sooner *my unchangeable* love to *you*, your wife, and your child.

[In a postscript he added]:—We have tried the tube without success. If you can come on Saturday, pray do.

Towards the evening a slight amelioration took place in the throat, and a few spoonfuls of milk were swallowed.

His composure was extraordinary. He continued to write from his bed numerous letters to friends, and papers on medical subjects, besides maintaining a correspondence on some matters of business, all of which were marked by great acuteness and clearness of ideas.

On the following day he wrote a letter to Mr. E. Hoblyn, which concluded thus:—

I have been so much worse from this cold weather, that on Wednesday and yesterday I could scarcely swallow at all; and I again began to think that my stay amongst you would be short. But yesterday I kept in bed, which always does me good, and to-day I swallow somewhat better. All this has made our Lord and Saviour infinitely more near and precious to me than ever.

On the same day, the 13th, he also penned the following note to Mr. C. Hunter:—

I am interested most deeply in Mr. Paget's case. I have written to him and I send you one paragraph of my letter, which pray return to me.

This cold weather has afflicted me much, as usual. [Some inquiries then follow as to the progress of Mr. Hunter's own investigations, and the letter concludes thus:—] I have a case of drowning in which the Ready Method (which should really

be called the *Steady* Method) succeeded in one hour and a half!

On the subject of Mr. Paget's case, alluded to above, he wrote a letter to the *Lancet*, commencing with these words:—

I do not think medical records contain anything more admirable for prompt candour and intrinsic value than Mr. Paget's case, &c.

Though not written till a month after this period, I cannot forbear to introduce here a tribute which he paid to the late Dr. Snow—then living—in another communication to the *Lancet*. It is this:—

I have no hesitation in affirming that the first three pages of this paper (by Dr. Snow) are amongst the most able and valuable in physiology, and I beg to be allowed to reproduce them in the pages of the *Lancet*, &c.†

These warm expressions of praise exemplify an amiable trait in my husband's character—that of delighting to bestow commendation and acknowledge merit where he believed them to be due; and this he did, not coldly and grudgingly, but frankly and heartily.

On the 19th of March he wrote the following letter to Mr. (now Dr.) E. L. Fox:—

I was glad to see your handwriting, and hope it will not be long before you give me that pleasure again.

I have passed a week or ten days of great suffering from dysphagia, the effect of a distinct attack of *pharyngitis*,

Vide the *Lancet* for March 21st, 1857, p. 289.

† Ibid. for April 18th, 1859, p. 397. Dr. Snow, in his work on "Anæsthetics," p. 109, alludes to "the honour" thus done to him by Dr. Marshall Hall.

whatever the substratum of my ailment may be. My case has been most distinctly marked by these exacerbations from cold, to which I am fearfully susceptible. The attack in London first shook me ; it consisted of bronchitis, pharyngitis, and coryza, leaving me thin and weak. My next immediately followed my journey to Brighton, and a slighter one my change of quarters here on a severe day. It was at this time that I was recommended to go to Hastings. But, to confess the truth, I dare not, for a very dubious advantage, incur a certain danger, or rather a certain injury. I imagine the storm which has so affected me here would not have been less injurious there.

My attack consists of aggravated dysphagia, &c., with intense thirst, heat of skin, with alternate cold, heat, and perspiration ; extreme debility ; great loss of flesh, &c.

I am rather better certainly to-day. Mr. Pollock prescribed ice taken and dissolved in my mouth : it was most grateful to me. Indeed, I liked it so much that it occurred to me that if the ice, instead of being water, were frozen *milk*, it would be food as well as cooling. I now take two pints of frozen milk daily.

On the 15th of March our kind friend, Mr. G. D. Pollock, had come from London to see my poor invalid, and was evidently impressed with the danger of his sinking. His suggestion of the ice to relieve the fever and thirst is again alluded to in the following portion of a letter to Mr. C. Hunter, on the 29th :—

The strong peculiarity of my present state is the regular evening fever, with dryness of the mouth and of the throat, with transitory augmented trouble in swallowing. I am taking early morning doses of quinine for this fever.

Mr. Pollock's prescription of the ice was most opportune and grateful, and the brandy scarcely less so.

I am persuaded that in my case there has been malarious

and remittent fever from the beginning; hence my extreme susceptibility to changes of the weather, and the character of debility and loss of flesh.

When at New Orleans, in 1854, he had been attacked with malarious fever, and he thought it probable that this had now recurred, as it is so apt to do.

For his bronchitis and pharyngitis his bed was surrounded with a double mosquito net, to modify the coldness of the air. This, which he had so often in past years prescribed for others, was now a great comfort to himself.

Whilst thus on a bed of sickness, life being with difficulty maintained, he received from Edinburgh a diploma constituting him an Honorary Member of the Royal Medical Society. The Senior President, Dr. S. P. Spasshatt, in a letter accompanying the diploma, cordially invited him to come to Edinburgh at the time of a *conversazione* about to be given by the Society, proposing that he should deliver some lectures there, an idea which had been suggested by Dr. Simpson; and he added—"I am sure your presence would be very highly prized," &c.

This honorary diploma, coming from a Society which had been the theatre of his youthful prowess, and of which he had formerly been Senior President, gave him extreme pleasure. He called it his "crowning honour."

Allusion has been made to his choice of a place of interment at Nottingham. He now wrote to Mr. Higginbottom, begging him to secure the spot he had

indicated. This subject was however concealed from me.

Till about this time he had generally written his letters, which were very numerous, with his own hand, sitting up in bed, when too ill to leave it; but now his extreme weakness rendered this too fatiguing an effort, and henceforth most of his letters and other compositions were written from his dictation.

To dictate well is not very easy; it requires distinctness of ideas and facility of expression. Some persons, in thus composing, become much confused themselves, and greatly perplex their amanuensis. My husband dictated with great fluency and correctness, never appearing tired, although most considerate in not fatiguing myself or any other person who wrote for him.

In a letter to Mr. C. Hunter, thus written from dictation, he says:—

March 23rd.

I am a little better since I wrote to you last, but very little: I am so weak and thin. What is extraordinary is, that I experience each evening a paroxysm of fever, viz., a slight chill, then continued heat of surface, thirst, dryness of throat, and augmented dysphagia; these yield to perspiration and its subsequent chill. Pray read this paragraph to Mr. Pollock.

P.S.—Ask Mr. Pollock what he would say to quinine taken in beef tea, for my fever, by means of an enema?*

*This mode of administering nutriment as well as medicine was now resorted to, by the advice of Mr. Pollock and Mr. Wildbore. The mixture consisted of five ounces of strong beef-tea, one ounce of port wine, and three grains of quinine. This was given three, four, and sometimes even five times daily, with marked benefit.

The following is extracted from the note-book of Mr. Wildbore, who kindly saw him every day :—

This attack left him very weak. He complained much of thirst, and said his feelings of hunger were *dreadful*. Still he was most patient, and even cheerful in conversation, under all his sufferings.

Although at the time of this attack, in March, he expressed no opinion of his immediate danger, yet I afterwards learnt that he had but little expectation of surviving it; indeed, his life at that period hung by a very slender thread. It was probably the knowledge of this which induced him to dictate—for he was then quite unable to write—a few autobiographical notes. Most of these have already been inserted in various parts of this volume, according to those periods of his life to which they relate. The following earnest and simple words formed the conclusion of this brief but expressive document :—

1. In religion, I read the Jewish and the Christian Scriptures; and I read no other book, these only being written by the Spirit; and I read them, accepting them as a little child, without interpretation or commentary, and obey them implicitly, and I do not presumptuously add to them, or omit from them, jot or tittle, in word or deed.

2. In the world I have confessed Christ, obeying God rather than man. Once I refused, in a Court of Justice, and at some peril, to take an oath. I have pursued my profession with scruple and honour and energy, and have observed great industry and economy; and I have provided for my old age, my wife, and my child, and his children after him.

3. I have occupied every leisure moment in pursuing the science of my profession.

These memoranda brought in review before him what he had accomplished during a busy and laborious life, and he said to his sister, who had watched his career from the day when he first quitted the parental roof to commence the great struggle of life—"Did you ever know any one work as hard as I have done all my life?" The sincere reply was—"Never!" To this sister he talked continually and with great earnestness on religious subjects.

About the end of March the distressing exacerbation of the dysphagia from cold was passing away, and I find from one of my own letters to my son, dated April 3rd, that he was now taking a quart of milk in the day, and a dose of quinine in a wineglassful of beef-tea. In the same letter the following observations are recorded:—

> He has been *very* feeble and poorly all day. Early this morning he said to me—"This illness has been a *great trial;* but my faith has *not* failed." A few mornings ago he said—"I have slept little; but my thoughts were *very happy;* indeed I think I am the happiest man living!" His patience and resignation are wonderful, and he appears always calm, cheerful, and happy. No murmur has *ever once* escaped him during these many long months of trial.

It is observable that his letters incline to a hopeful, cheerful character. Except when writing to friends anxious to know every detail, he scarcely alluded to his illness, or at least very slightly. He never wrote in complaining or exaggerated terms, and seemed pleased to acknowledge the slightest amendment. I

now quote a letter which he dictated to his valued friend M. Louis, on the 3rd of April:—

Mon cher Ami—Je ne veux pas vous laisser attendre une bonne petite nouvelle. Ma fièvre est moindre, et la sècheresse de ma gorge un peu diminuée. J'avais déjà commencé à prendre le quinine, et lors de l'arrivée de votre lettre, j'en ai augmenté la dose jusqu'à 18 grains par jour, peut-être un peu trop brusquement. J'en reviendrai. J'espère que demain sera aussi bien qu'hier.

Cette lettre vous sera encore remise par M. Morfit. Je ne peux pas oublier les amitiés de sa bonne famille lors de notre visite à Baltimore et à Chicago. Lui avez-vous donné une petite note pour M. M——? Voulez-vous avoir la bonté de lui demander à qui il voudrait être présenté d'après cette simple manière? Je vous prie, en faisant cela, de ne pas faire davantage; je ne veux pas que vous vous donniez de la peine. Nous espérons que notre chère Madame Louis est entièrement rétablie de sa maladie. Ayez grand soin de vos santés; je vous affirme que ce don de la Providence est bien précieux, et quoique vous soyez affligés on ne peut plus, vous seriez bien plus malheureux encore si vous voyiez l'un l'autre accablé de faiblesse et de douleur.*

Notre fils, notre belle-fille et notre petit-fils se portent bien. L'enfant est vraiment une merveille. Il donne des coups de pied à la terre, pour exprimer l'énergie de ses volontés, déjà! —Tout à vous, mon cher ami, de ce pauvre cœur abattu, MARSHALL HALL.

The following was addressed to Mr. E. Hoblyn on the 6th of April:—

I will not delay longer informing you of my state. I have made a slight but gradual progress almost ever since I had the pleasure of seeing you. My evening fever and dryness of the throat are diminished, and my strength somewhat restored, and, what is most important, I swallow with a little less difficulty.

* Alluding to the loss of their only child, a son of great promise.

In my spirit I have been most happy. I chiefly delight to think of Jesus in His transfiguration, in His humility and crucifixion, and in His meeting the disciples on their way to Emmaus. Every word is intensely affecting. . . . . I can truly say that I have not had an unjoyous hour.

On the same day he dictated the subjoined:—

My dear Hunter—All *idea* motions must be *mental* or *psychical*. All spinal actions are of *physical* origin. The former are *direct*, the latter may be either direct or reflex. They are *toto cœlo* distinct and different, and Dr. ——'s writing is only calculated to lead to confusion. How do your own affairs proceed?

My own health is again gradually improving; but how shall I entirely avoid renewed attacks of my febrile pharyngitis? The last had nearly destroyed me. My hope is in the coming fine weather and a systematic plan of treatment.

On the 11th of April he penned with his own hand the following letter to the same constant correspondent:—

My dear Hunter—I write in bed. I am much better, but sadly shattered by this last attack. But the fine weather will, I trust, come in due time.

I write specially now to send you the enclosed paper. It is one of *four* only left; and I much wished *you* to possess it. I call it my portrait. Keep it in remembrance of me.

Let me hear from you soon—all about your prospects and doings.—Ever, ever yours, MARSHALL HALL.

The paper which he called his "portrait," was a tabular arrangement of the physiology of epilepsy, its causes, &c. It was truly a portrait of his researches and of the chief labours of his life.

My next extract is very short, but characteristic.

I need scarcely explain the request which called it forth :—

April 25th.

My dear Hunter—Certainly! I will write you the very best certificate I can devise and pen.

Reduced to a state of extreme debility by the privation of food, to sit up during the few minutes requisite for arranging his bed every evening, was a distressing fatigue to him; yet he went on working mentally. During the month of April he addressed three communications to the *Lancet*.* He likewise occupied him-

* 1. A Note on Tracheotomy, in which an instrument devised by him is figured; *Lancet* for April 11th, 1857, p. 370.

2. Postscript to a Note on the Fatal Case of Chloroform; *Ibid.* for April 18th, p. 397.

3. The Excito-Motory System; *Ibid.* for May 2nd, p. 462. This, which was his last communication to the *Lancet*, consisted of an act of justice promptly and unhesitatingly rendered to Dr. H. F. Campbell, of Augusta, Georgia, U.S. That it was appreciated is proved by the following expressions used by that gentleman in a letter to my son, after my husband's death :—

Augusta, Georgia, U.S., Feb. 6th, 1858.

Dear Sir—I have recently collected into a volume certain papers of mine, under the title of "Contributions to the American Medical Association." In writing this book I have taken great pleasure in rendering it a contribution also to the memory of your illustrious, lamented father, Dr. Marshall Hall. The work is dedicated to him. I have ordered a copy to be sent, &c. &c.

I cannot, dear sir, express the feelings of deep veneration and regard which I have ever cherished for the name of "Marshall Hall." His investigations in regard to the reflex function of the nervous system have been the spring and incentive to my every aspiration, from my earliest days to the present time. His name has become a "household word" in my home, and indeed *everywhere* that the nervous system is studied.

Last year I saw in the London *Lancet* an article by your father, announcing a new function of the nervous system. It happened that I had been so fortunate as to have presented the same views previously. I wrote to him, presenting respectfully my claim of priority. Though labouring at the time under a most distressing affection, and within but

self in gathering together the numerous cases of resuscitation by his own method, appending to them some original remarks not previously published, and the substance of the pamphlet which he had, a year before, presented to the Royal Humane Society. He proposed that these materials should form a volume, and accordingly wrote to Mr. Churchill on the subject of its publication. The latter paid him a visit at his bedside, and undertook to publish the work. At this interview he conversed very cheerfully with Mr. Churchill, and this gentleman happening to mention

a short time of his death, with that nobleness of soul which had ever characterized his actions, and which I confidently calculated upon in throwing myself on his generosity, he promptly answered my appeal, and did me *ample justice* in the important question. His acknowledgment of my claim is my bulwark of defence. To him I owe the quiet possession of all the reputation and credit it may yield me, and his name must ever be associated in my mind with the most grateful and loving remembrances.

In this country the name of no European *savant* is more familiar and more honoured than that of Marshall Hall.

It affords us great pleasure to find that you are engaged in bringing forth his last great contribution to humanity and to science. The work will find a wide circulation throughout all this country.

I hope, my dear sir, you will excuse the familiar manner, for a stranger, which I have assumed in addressing you. My only apology is, that I have ever felt *near* and familiar to everything which pertains to the great *guide* to the true philosophy of the nervous system.

I am, dear sir, with great respect, your obedient servant—HENRY F. CAMPBELL.

In a subsequent letter, Dr. Campbell very frankly and modestly says: "All which M. Brown-Séquard has done himself, all which his distinguished friend and countryman, M. Claude Bernard, has done in *this* department of the Nervous System, and my own humble labours, had, as their *necessary basis*, Dr. Marshall Hall's previous achievements; for, had he not demonstrated the truth of the *general* doctrine of Reflex Action, by his discovery of the Excito-*Motory* Function, none of these Physiologists would, in all probability, have devised experiments in reflex *secretion*."

that he had some daughters at school in Brighton; my dear husband, after his departure, expressed to me and to a niece, a wish that these young ladies should be invited to pay me a visit. I mention this little incident as one among a vast number which showed how constantly he thought of giving pleasure to all around him, even during his own sufferings.

His hunger was at times *most distressing*, and although every expedient which ingenuity could devise in food was resorted to, there was no possibility of appeasing it. At one time he thought he swallowed nourishment better when in the form of *jelly*, and accordingly everything he took—milk, beef-tea, small quantities of strong Burton ale, port wine, &c. &c.—were all severally converted into that state by the addition of isinglass or gelatine.

Never can I forget the anxiety manifested by all to minister to the comfort and pleasure of the dear invalid. Amiable friends kept a constant supply of his beloved flowers on the table by his bed of sickness. A thousand kindly acts are indelibly engraven on my heart, and names previously unknown to me are remembered with gratitude. In fact, his patience and benevolence inspired love and admiration in all around us.*

* One there was, formerly his patient, from a mountain-girt castle in Scotland, with the kindest of hearts, who, during her stay of several months at Brighton, *never* failed in the *daily* visit of inquiry, and, as she passed by the florist's, the choicest bouquet was always selected for the chamber of sickness, where, let me assure her, she was never forgotten.

And many others there were, whose unfailing kindness and heartfelt sympathy were truly a balm.

On the 22nd of May, he said, in a letter to Dr. Webster of Dulwich:—

Is it not strange that, with the exception of the little paragraph in Abercrombie, I can meet with no intelligence whatever in regard to my own peculiar case? A new symptom has been added to the others the last few days—viz., a little earache in both ears; and I hear a little cliquetis in my breathing, denoting slight bronchitis—both examples of, as I suppose, inflammation diffused along the mucous membrane.

I shall be glad to hear what tidings you have of houses near the Crystal Palace; but, from all I hear, they must be very scarce, and Marshall has gone up to-day to look about the neighbourhood of Westbourne Terrace.

Influenced by your good opinion, I have returned to the title of my little work, which you pronounced *perfect*.—Your affectionate friend, MARSHALL HALL.

The following are extracts from some letters to Mr. C. Hunter:—

May 17th.

I am stronger and less thin.

I am glad you are so engaged at the hospital. It is the best preparation for a future honourable career in your profession.

Do not trouble yourself to write to me, *except* when you have something of value to write about. Devote every moment to your professional duties.

May 28th.

I quite agree with you, that many cases will be successfully treated by postural respiration, of which I have yet no idea; and I trust to you to ferret them out.

I shall always be very glad to hear from you, but beg you will not let writing to me interfere with your hospital and other duties. But what is more—I hope soon to see you, for I hope soon to be in London. The weather is now charming for the purpose, and an invalid carriage would convey me from this door to that of my lodging. You shall then come and talk to

me; but you are to expect from me few words, and those monosyllabic.

[A kind mention of some friends here occurs.]

I have this day been in bed eleven weeks! . . . . I have three times had a violent ague-fit—rigor, fever, profuse perspiration; and you remember my constant accession of evening fever. . . . I have been reduced to the utmost degree of emaciation and debility; but am now daily recovering strength and flesh.

Write to me whenever you think I can be of use to you.

P.S. You will see a most glorious case in the *Lancet* of to-morrow—that of a child drowned in a tub of soap-suds.*

Our son, his wife, and child, spent the month of May with us. During the whole of their visit, my dear husband kept his bed. He liked to hear music, piano and flute, in the drawing-room, which was under the room he inhabited, and he often asked for the serenade from "Don Pasquale," an air which had always been an especial favourite with him. The following are a few recollections of that period from the pen of my daughter-in-law:—

I know that you wish for any little details that I can remember, relating to those sad months when our dear father was in so suffering a state at Brighton. When we were with you in May, one thing which struck me very much was, his *great* anxiety about you; he seemed to fear that your health was failing, and often asked me, when alone with him, if I noticed that your memory was very uncertain. He also insisted strongly on your taking daily walks, and used to say to Marshall—"Take your mother to the end of the pier." If anything prevented your walk, it grieved him extremely, and

* The "glory" of this case consisted in the recovery of the child by "The Marshall Hall Method." See the *Lancet*. A similar case appeared in the *Lancet* of May, 1861, recovered by the judicious employment of the same treatment by Dr. Cuthbert, of Edinburgh.—C. H.

from his whole manner it was evident that he feared some very severe illness for you.

Our darling Algy was a year and a half old when we were with you, and it always surprised us that he was never in the least shy with his dear grandpapa: from the first, he would run into his room and peep through the bed-curtains at him, and was always pleased when taken to see him. When passing the door, he generally said—"Poor Gan-pa's room; baby go and see Gan-pa," and, if not prevented, would run in by himself, the door of the room being generally left a little open.

Whenever I think of the month we spent with you, the one thought uppermost in my mind is always our dear father's *wonderful* patience and cheerfulness; he was always *so satisfied* with everything, and had a smile and a kind word for every one. In him was most strikingly fulfilled that beautiful promise, "Thou wilt keep him in *perfect peace* whose mind is stayed on Thee, because he trusteth in Thee." Surely nothing but his simple child-like trust in God could have produced such a constant cheerfulness, and calm, quiet happiness in the midst of suffering so peculiarly trying.

The following letter to Dr. Webster, of Dulwich, dictated on the 1st of June, explains his state at that period:—

My dear Friend—On Monday morning last week I had the most violent paroxysm of ague. This was repeated on Wednesday afternoon, and on Thursday at 4 p.m. On Friday morning I had two *violent* paroxysms. I can hardly describe to you the rigor and the anhelatio.

* We had feared that the dear child would not like the appearance of an invalid, muffled up in bed and wearing a nightcap: but there was something in the expression of his countenance which always pleased children. He was too weak to exert himself to amuse him, further than by helping to pile up the wooden bricks on the bed, in the demolishing of which consisted the fun; and this little fatigue could only be borne for three minutes at a time.

I have all along had, at times, evening remittent fever.

At New Orleans and Havana† I suffered from brow-ague, which was cured by large doses of quinine.

Before Friday I was, through mistake, taking *trifling* doses of quinine, *thinking* that I was taking *very efficient* doses. On Friday afternoon I took ten grains of the sulphate of quinine in the form of enema, and have done so twice a day since, and have had no more paroxysms, except a little remittent in the evening. These paroxysms have shaken me sadly in more senses than one,‡ and I am rather weaker than I was before them.

So much for my ague.

Now for my throat. It is certainly not worse, but rather better. I can swallow rather better. I live now almost entirely on milk. What is singular I will now explain: I take three dessert spoonfuls of milk in succession, and then it seems to entangle itself about the pharynx, and I can take no more until I have coughed up a little portion of mucus and milk mingled together. I have this day, however, discovered a mode of obviating this difficulty. We mix half an ounce of brandy in a tumbler of water and add plenty of sugar. A teaspoonful of this, taken after the third spoonful of milk, clears the pharynx, and I can, without having coughed and expharyngated anything, then swallow as at the commencement.

All our friends have left us. I am anxious to be in London, and then I hope to see you.

Ever yours affectionately, MARSHALL HALL.

P.S. I never sufficiently thanked you for your long and able letter; and now I only write to ask fresh favours. I want you to be well acquainted with my symptoms.

My chief malady is certainly of the pharynx, adjacent to the larynx. My expectoration (or expharyngation) is froth, as as snow. Formerly I used to spit a little blood; but I

think he meant to say ever since the attack caused by the severe of the preceding March.

† In the beginning of 1854.

‡ Sometimes his memory was a little affected by these paroxysms.

have seen nothing of the sort, with the single exception of a dot, for months. The nostril, the mouth, and the bronchia have been involved. I think there is a little obstruction about four inches down the œsophagus; for on passing a tube some time ago, there was a little force required to pass that particular part.

I have no *progressive* emaciation. I lose flesh in my fits of fever and then slowly regain it; my age and my difficulty in swallowing being the two impediments to a more rapid rally.

When I have suffered the most, the parts in front of the neck have been very painful on pressure. I have no such pain now, and there is not the slightest enlargement.

About this time he requested Dr. Webster and some other friends to meet in London and consult with Dr. Quain as to the propriety of applying the nitrate of silver to the throat.

The two following dictated letters to Mr. C. Hunter give a further description of his state during June, as well as of his occupations:—

"June 10.

My dear Hunter—Stick to your hospital and its duties, and only write to me at leisure, with something important to say.

If you will write out your case of the treatment of the dying boy affected with chloroform, I will insert it in my forthcoming volume, which is in the press.*

I had another ague-fit yesterday, and the storm has affected my throat—as usual.

I shall be most glad to hear of Mr. Fox's success at Oxford. Will you undertake to let me know immediately?

A child still-born at six and a-half months!—restored to *life* with little chance of *living!*

* The boy was resuscitated by Mr. Hunter's prompt employment of the Marshall Hall method.

Another case of drowning—in the *Lancet*, I expect. The case of Dr. Alexander was admirable. The method did good; the warm bath harm; and the method good again, restoring the patient.

The patient is dying for want of air; four minutes of apnœa [they say] are fatal; yet the Royal Humane Society "*pause*" as to the administration of air? . . . .

With every good wish for your success, believe me ever yours most sincerely, MARSHALL HALL.

June 23rd.

My dear Hunter—Pray see Dr. Fox, and make my most sincere and hearty congratulations.* I was constantly thinking of him. I suppose he will now go to Bristol; but tell him that I shall be truly rejoiced to hear from him.

In the beginning of this month, after the warm weather, I was wonderfully better; I walked into the drawing-room and back again,† and ate some lamb, using my knife and fork for the first time, and swallowing fairly well.‡

But the north-easterly winds, which then began to blow, brought with them what I call a second March, and you know the effect of such weather upon me; I have accordingly not been so well. I am a true thermometer, or rather, an anemometer, for it is the easterly and north-easterly winds which are my *bane*.

I think your observations on —— excellent, and I hope you will one day pursue the subject.

I am glad to hear that you are so busy at the hospital. Do one thing at a time, and this is the time to devote yourself to your hospital duties with undivided attention.

I have nearly finished the MS. of my book; it will contain many useful things, besides *your* case of chloroform; but I do not find a sick bed the best place to write from.—&c. &c., MARSHALL HALL.

* On taking his degree at Oxford.

† After being confined to his bed for three months.

‡ He ate a fair dinner of lamb and asparagus three or four days in succession, swallowing without difficulty!

At this time, besides the maladies alluded to in the foregoing letters, he suffered alternately the *tortures* of a ravenous hunger which his defective power of swallowing did not admit of appeasing; and a painful disgust at such sustenance as alone he could take. I have seen him, when the cup of milk was placed before him, avert his eyes from it with loathing, though without uttering one word of complaint. Besides this, the efforts to swallow were attended with much exhaustion.

One of the effects of the stormy weather in June was the loss of his voice, which continued for some weeks. He remained in bed during the greater part of this month. The events alluded to in the following portion of a letter from the Hon. A. H. Vernon, took place about this time:—

> I shall never, in thinking of Dr. Marshall Hall, cease to admire the fortitude with which he faced the termination of his most protracted and painful malady, which did not even prevent his giving me his opinion and advice when my father had been seriously ill. At that moment there were few who would have allowed their privacy to be interfered with, and I shall always look back upon this as a most striking example of courage, which was the more marked from the wonderful calmness and composure of mind with which he received me.

At this time he was continually writing to persons in business in London, trying to get employment for the poor boy, who had been rescued from a state of dementia consequent on frightful attacks of epilepsy, by the judicious manner in which Dr. Ogle had carried out my husband's views. His warm benevolence

See p. 367.

ever impelled him to active assistance; and there are those in Brighton who, to this day, bless his name for the benefits he conferred during his last illness; for his own sufferings even were unheeded in ministering to the alleviation of those of others.

I have some difficulty in persuading myself to lay before my readers a very precious scrap which he one day gave me, written in pencil, when unable to bear the agitation and fatigue of *speaking*. Nothing but the most intense desire to place in its true light every trait of my beloved husband's character could have induced me to quote the following sacred expression of his feelings towards myself:—

Brighton, May 30th, 1857.

Dear, dear, dear Charlotte—I love thee more dearly, more tenderly, more fondly than ever. I can sometimes scarcely look at thee and watch thy care of me without tears. And my prayers in the night are for thee.—Ever, ever thine, entirely thine, MARSHALL HALL.

We had been alone some weeks when his beloved sister and a niece paid him a second visit. To the former, he one day said, "I am quite prepared to go; but not ready to leave you all." The latter has kindly furnished me with the following recollections of some of the remarks he made at various times during her stay with us:—

"A glorious prospect lies before me; I cannot, of course, tell what it is, but it is something very glorious."

"All my happiness is above."

"What do we talk most about?" The reply being, "That which most occupies our thoughts;" he added, "Then observe how frequently St. Paul writes about the second coming of Christ; the reason is, because he delighted to dwell upon

it. Have you a taste for the beautiful? for this is SO BEAUTIFUL!"

"There cannot be three more beautiful prayers than these: 'God be merciful to me a sinner!' 'Lord, remember me when Thou comest into Thy kingdom!' 'Lord Jesus, receive my spirit!'"

"Live near to Christ."

"The more I know, the more I adore."

One day when his bed was being arranged, he said, "How every natural and familiar event is made use of in the Scriptures to illustrate spiritual things; for instance—'Thou wilt make all his bed in his sickness.'"

"Though I have taken great interest in my profession and in scientific pursuits, yet religion has been with me the principal thing for more than thirty years."

The Scriptures were, as ever, his chief delight and consolation, and always lay on a table by his bedside. One of the kind servants of the house in which we were, remembers that one day when she had removed the things from the table during her dusting operations, he said, "Mary, where have you put that *blessed* book?"

Whenever I proposed to read the Scriptures to him, his eyes glistened with pleasure, and his emphatic reply was, "Oh do, if you please!" Among many other passages carefully marked with his pencil in the margin of his Greek Testament was that in 2 Timothy iv 6—8, 16—18.

During the long period that he kept his bed, he was always surrounded by books and papers. One favourite volume constantly beside him was the beautiful "Histoire de la Découverte de la Circulation du Sang," by Mons. Flourens, the composition as well as the matter exciting his great admiration. A highly favourable

notice, from his pen, of this elegant little work, appeared in the *Lancet*. A few times in his life he wrote a *favourable* review—*en amateur*—*never* an *unfavourable* one.

In his personal habits he was always extremely neat and exact. The gentle Elizabeth, a servant of unusual refinement, said she used to think that she never could attend on an invalid; "but Dr. Marshall Hall," she added, "is so neat and *nice* in all his ways, that I can do anything for him!" And the open-hearted Mary declared, in her own honest way, "There is nothing which any one of us would not gladly do for him."

In the beginning of July, my dear invalid was a little stronger. His deglutition remained in much the same state, and he subsisted on milk flavoured with ale and sugar.

The nitrate of silver had been repeatedly applied, and had produced neither good nor harm.

He now came down into the drawing-room daily; and, notwithstanding his long illness, confinement to bed, poor diet, and exhausting ague fits, his activity was marvellous. A lady in the same house with us, one day heard a quick, light step mounting the stairs: what was her amazement to find it was that of the poor invalid!

I gather the following particulars from letters written by myself to friends at this period:—

He suffered no pain; his pulse was good; his complexion fresh and healthy; and, though thin, he did not look ill.

With all these favourable symptoms, what wonder

if those who watched him with intense anxiety were beguiled into the fond hope that he was not yet to leave them!

The following letter of a friend who visited us on the 17th of July, describes his state at that time:—

My dear Mrs. Hall—It is a great pleasure to me to reflect that I had the opportunity of seeing your beloved husband in the last few weeks of his valuable life. I came to Brighton about three weeks before he died. I shall never forget *how heartily* he shook me by the hand and expressed his pleasure at seeing me, and learning from me how greatly our friend Mrs. D—, for whom he had so kindly prescribed during his days of extreme weakness, had recovered.

If I had not seen his attenuation, and heard his feeble voice, I could not have believed him near his end, for his mind appeared as vigorous as ever—his readiness to hear about others, and advise for their comfort, as active as when in health.

I shall never forget his unselfishness in going away by himself, to avoid, as you afterwards told me, causing pain to others by observing his difficulty in swallowing. He ran up stairs as if in full health and strength! I was greatly astonished at his rapidity.

I think he was then aware of the short time he had to remain with those around whom his *very warm* affections clung, for he requested his niece to copy Mrs. Barbauld's beautiful lines for me; although, to cheer and keep you up, he asked me to look out for a cottage like ours, which he and you might occupy.—&c. &c., T. M. P——.

On the morning of the 20th July he walked briskly down stairs, carrying his books in his hand, and established himself on his couch in the drawing-room before nine o'clock. At noon his beloved sister took

her departure. Emotion had, all along, been apt to produce the chill-fits, and on this occasion a very severe one occurred, followed by burning fever and then profuse perspiration. These attacks always caused terrible prostration and disgust for food.

It was at this period that he requested Mr. Paget to see him, previously sending that gentleman a history of his case, which will be found on another page. Mr. Paget most kindly paid him a visit. Mr. Lloyd, being at Brighton with his family, also saw him repeatedly, with very great kindness, as likewise Dr. Alfred Hall. The extreme kindness of Mr. G. D. Pollock, and the unfailing valuable attentions of Mr. Wildbore, have already been alluded to.

About the end of July and beginning of August, the invalid took a *very short* drive several times, enjoying the air and catching no cold. During one of these drives into the country, he looked around at the verdure with evident pleasure, and said—"How beautiful nature is! I thought at one time that I should never more look upon these objects." On the latter occasions he was carried both down and up stairs.

From my own letters to friends, I extract the following details:—

July 26.—He is weaker and sleeps constantly.

A little recovered from the ague-fit of the 20th; has had a *short* drive the last four days; swallowing, much as usual.

July 31st.—Still almost always asleep; his eyes do not perfectly close, and he talks in his sleep; his chest heaves with a sudden jerk during sleep.

August 3rd.—Still sleeping, and snoring very loud. He says he passes his time in "a half dreamy, half sleepy state;" mutters in sleep; took to-day half a pint of soup, but did not like it; generally takes daily two pints and a half of milk, but dislikes everything. Weakness increasing.

August 6th.—His bronchitis has become, he says, more of an asthma, and his breathing is loud and laborious, especially after the *slightest* effort; pulse a little quicker, being rather above eighty, though sometimes it becomes as high as a hundred.

On the 27th of July he dictated the following affecting words to a dear friend who had proposed to come and see him—a visit which he was under the painful necessity of declining.

What can I do? My friends wish to see me; it would gladden my heart to see them; but it wears me down. I have no strength to listen—no voice to speak with. Twice visits from affectionate friends have been followed by ague. [Some kind inquiries and messages here follow.]—I remain, my dear friend, affectionately yours, MARSHALL HALL.

Notwithstanding this gradual wasting of the physical powers, his mind was as clear and as acute as ever, though with this difference—that he was now unable to attend to anything for more than a very few minutes at a time. The following short letter to Mr. C. Hunter—the last he ever dictated—shows that the intellect was undimmed; and the first sentence displays that consideration for others which had always been so marked a feature in his character, and which remained so to the last moment of his existence; it is remarkable, too, that he does not even allude to himself. This letter also manifests that precision of ideas, and power of minutely discriminating between symptoms—

in short, that talent for diagnosis—which had so early in life distinguished him.

37, King's-road, Brighton, August 5th, 1857.

My dear Hunter—Observe your strength from day to day, and do not work beyond it.

I think your case of amylene was one of asphyxia, primarily, and not of apnœa passing into asphyxia, and that in such a case not even the postural method will be availing.

In all the successful cases, apnœa began, and asphyxia closed, the series of phenomena; and you know that for apnœa, postural respiration is the special and immediate remedy.

But what was the precise nature of the other case, of croup, &c.? What seemed the immediate danger of death? Was it blood or other matters in the windpipe? Then, indubitably, brisk pronation and brisk pressure, followed by rotation, would be the remedy.

I should exceedingly like full and particular details of both cases.

Write to me again very soon.

Excuse pithy replies, and believe me yours very sincerely, MARSHALL HALL.

Two days later, when the details of the cases did arrive, he was, alas! unable to hear them read to the end. In the meantime, on the 6th, our son had arrived, and I believe the pleasurable emotion at seeing him had an exhausting effect. He was on his couch in the drawing-room *for the last time*, and my son carried him upstairs. Although this was effected with the greatest ease and in the gentlest manner, the exhaustion it produced was most distressing.

* Several fresh cases of recovery from drowning, by the Marshall Hall Method, had just been communicated; but the last sheet of the book on "Postural Respiration" was already pressed off, and its author thought it best not to arrest its completion.

Within three weeks he had rapidly declined in strength, his emaciation was great, and he had now become pal[illegible]t there was no pain, and all that seemed requisite to restore him was the power of taking more nourishment.

One day, as I watched him lying on his couch, pale, emaciated, and languid, I said, "How sad it seems that you cannot take a good meal to support you!" He replied, in a very gentle but earnest manner, "We must not say so; we must be submissive in ALL things!"

His patient and meek endurance did not result from a cold, apathetic, or reserved temperament, for he was of a most ardent and frank disposition. It arose from his entire submission to the Divine will. Besides this complete resignation, his considerateness for the feelings of those around him prevented his complaining. Towards others there was the tenderness of a woman, whilst in regard to himself there was a calm resolution which never flinched.

The effort of speaking seemed now too much for him; yet, three days before his death, hearing that a poor needlewoman was in the house, whose child's health and sight he had been the means of restoring, he anxiously asked, with the feeble voice which alone remained, "How are her children?"

On the evening of the 9th he appeared to be sinking, and when for a few moments he awoke from his constant dozing, there was a forgetfulness of words. In the night an occasional lump of ice much relieved his mouth.

* Up to this period his complexion had remained fresh and healthy.

On the 10th he was better, and continued during the day to improve. At night every symptom was mitigated; his power of swallowing actually seemed to be restored, his pulse was better, his recollection perfect. Such was the apparent improvement, that I fondly entertained the hope that he would rally from his present state, as he had done from the attack in March, when so fearfully reduced. His sister and a niece had now arrived in consequence of a telegraphic despatch, but I did not dare to tell him of this abruptly, fearing to excite an ague-fit.

This night he slept quietly till about 2 a.m. I then gave him a little ice and some milk. With a very feeble voice he said to me repeatedly, "Go and lie down." About four o'clock he had again some quiet sleep.

At six in the morning of Tuesday, the 11th of August, I perceived an unmistakeable change in the countenance; the cold hand of death was upon him. He had taken a little more milk. I felt his pulse; he asked me how it was. It was very feeble. I said, "Have you been able to think of the Saviour in the night?" With a deeply earnest expression of the eyes, which I can never forget, he replied in a most *emphatic whisper*, "*Constantly!*" Again he repeatedly said to me, "Go and lie down!" Our son now came to his bedside. He kissed his father, who looked earnestly and smiled affectionately at him. Some milk was brought to him by the servant, Mary; he smiled at her, and took a few spoonfuls from my hand. He now only spoke in so faint a whisper that it was difficult to catch the sounds.

He saw his sister and niece; they kissed him, and it was evident that he recognised them. He then uttered five monosyllabic words in a whisper, but very distinctly, pausing between each word, so as to be heard by all in the room. Even a whisper seemed to exhaust him, and I have often thought since, that he had well considered what he wished to say, and had so constructed the sentence as to cause him the least exertion. These few words had reference to the comfort and happiness of a brother. Unselfish to the end, his last words were directed to promoting the good of others.

There was no demonstration of suffering; his countenance was calm and placid, and there was not the slightest struggle. Twice he very suddenly and energetically raised both hands and joined them as if in earnest prayer, letting them fall quietly back upon the bed. Was some blessed revelation vouchsafed to him in that moment? The movement was so sudden as to suggest to me the idea of surprise and adoration. The power of speech had failed, vision had failed, the pulse was scarcely perceptible, the breathing became slower and slower, fainter and fainter. For a brief space there was a rattling in the throat; sensibility had passed away. They said it was twenty minutes past eight o'clock when his spirit and his soul departed from their poor earthly tenement; but the failing of the vital powers was so gradual, that it would be difficult to fix the precise moment.

Thus peacefully did this remarkable man, this servant of Christ, fall asleep in Jesus. With his great mind he was as a little child in his pure, simple, fervent faith.

A smile rested on his countenance after death, and the features were entirely free from alteration, retaining the happy expression which marked them during life. The calmness and peacefulness of his departure left a profound impression upon all who witnessed it. There was nothing appalling in such a death; it was divested of terrors, and we felt how blessed it is to "die the death of the righteous." It was for ourselves that we wept, not for him, for we felt that his lot was an enviable one, whilst we were left to struggle on a little longer.

CHAPTER XVIII.

OBITUARY NOTICES—LETTERS FROM FRIENDS.

THE following is abridged from an account which appeared in the Nottingham papers:—

FUNERAL OF DR. MARSHALL HALL.

The mortal remains of this distinguished man were interred in the General Cemetery of this town, on Wednesday afternoon. The body had been conveyed, on the 12th instant, from Brighton to the residence of Miss Hall, the sister of the deceased, at Sneinton.

In accordance with his own wishes, a *post-mortem* examination had been made in the presence of his brother-in-law, Mr. Higginbottom, his nephew, and some others of the principal medical men in the neighbourhood, the result of which showed how correctly he had formed his own opinion as to the nature of the malady under which he had so long laboured.

We understand that it proved to be ulceration of the upper portion of the trachea.

The funeral procession left Sneinton shortly after twelve o'clock, and on arriving opposite the Exchange Hall, was joined by the Venerable the Archdeacon Wilkins, one of Dr. Marshall Hall's earliest friends, John Bradley, Esq., the Mayor of Nottingham, several influential gentlemen, some from a distance, and by the most eminent medical gentlemen in the town and neighbourhood and some from other counties, who embraced the opportunity thus afforded them of paying a last tribute of respect to the memory of one who had for so long a period ranked amongst the greatest ornaments of their profession.

All the male relatives of the deceased attended as mourners. A vast concourse had assembled, whose demeanour was marked by silence, respect, and solemnity.

I have erected a monument of red granite on a basement of grey, the whole highly polished, and bearing the following inscription, by direction of my beloved husband :—

IN MEMORIAM
MARSHALL HALL, M.D.
NATUS EST FEB. XVIII. MDCCXC.
OBDORMIVIT AUG. XI. MDCCCLVII.

Πᾶς οὖν ὅστις ὁμολογήσει ἐν ἐμοὶ ἔμπροσθεν τῶν ἀνθρώπων, ὁμολογήσω κἀγὼ ἐν αὐτῷ ἔμπροσθεν τοῦ πατρός μου τοῦ ἐν οὐρανοῖς.—MATT. x. 32.

The design, by Mr. Tasker, the Architect, of Bedford Row, which has been greatly admired, is of the simple massive kind which the deceased would have chosen, and had desired might characterize it.

All the alleviation which human sympathy can impart it was my lot to experience. Private letters from a vast number of kind friends who highly appreciated and deeply mourned my invaluable husband, were a source of great consolation to me under my unspeakable bereavement. And I must add that the numerous public expressions of the same nature were also a balm to the heart of the afflicted widow. Three days after the mournful event, an obituary notice of three pages appeared in the *Lancet*, written with deep feeling and appreciation. It commenced thus :—

Death, that most unsparing of tyrants, has exacted from the greatest physiologist of the age the last debt of nature. Slowly, surely, and relentlessly, disease has been undermining the earthly tabernacle of a mind which, for vast powers, high purposes, and indomitable energy, has found no superior in its native land in the present half-century. On Tuesday last, the 11th instant, Dr. Marshall Hall died, at Brighton, aged sixty-seven years.

It is impossible to record this melancholy event without feelings of the deepest sorrow. The loss is one which all must feel most keenly who have a reverence for high endeavours, for earnest devotion to science, and for all the sterling qualities which can adorn a man. Science has lost the worthiest of her sons, medicine has lost a great master, and philosophy a great thinker. The clear and vivid intellect of this celebrated man has steadily and successfully risen superior to the depressing influences of disease for the last eighteen years. Even during the present year, when confined to one room, his chamber has been a scene of intellectual activity. Physical debility, which robs most men of their power of thinking and reasoning, had not dimmed the brightness of his wonderful mind. Clear and penetrating, and impelled by a wide philanthropy, the last contribution of Dr. Marshall Hall to science has been a pre-eminently useful one to the cause of humanity. It is thus that great men should die. There is a grandeur in such a life-end to which the mere external grace of a falling Cæsar is not for one moment comparable.

A notice of similar length in the *Medical Times and Gazette*, was also ably written and contained much which was gratifying.

At the Institute of France, M. Flourens made the following announcement:—

J'ai la douleur d'annoncer à l'Académie la mort de M. Marshall Hall, l'un des Correspondants les plus regrettables, et l'un das physiologistes les plus célèbres de notre époque. La science perd, en cet homme rare, un observateur habile,

un penseur d'un esprit fin, et qui a enrichi la physiologie de théories et d'expériences ingénieuses.

In a private letter addressed to me by M. Flourens and his amiable wife, full of the warmest sympathy, the former, in speaking of my husband, said—

Vous savez quelle est l'estime que je portais à son génie, et quelle vive sympathie m'inspirait son caractère *franc, délicat, généreux, ouvert.*

The annual meeting of the *Naturforscher* in Germany, so celebrated throughout the world, was, in 1857, held at Bonn. From the *Scotsman* of October 21st of that year I extract the following:—

On Monday, the 21st of September, Privy Councillor (*Geheimerath*) Mayer, in taking the chair, referred in a feeling manner to the deep loss which science and the medical art had recently sustained in the too early death of Dr. Marshall Hall, who, however his claims may have been contested, was indubitably the author of the theory of the reflex function of the spinal marrow. Dr. Mayer proceeded to notice the merits of the deceased in regard to the physiology of the nerves, and the doctrine of asphyxia. In reference to the latter subject, he laid before the meeting a little work which he had received only a few weeks ago from the deceased, on the method of restoring persons apparently drowned, and concluded by calling on the meeting, in recognition of the deceased's services to medical science and suffering humanity to rise from their seats and honour his memory with a *Sit ei terra levis.* The manner in which the President's proposal was instantly responded to showed the high estimation in which our countryman was held by his brethren of Germany.

Dr. Harley, of 77, Harley Street, who was present at this meeting, says, in a letter to me:—

This very brief notice gives but an imperfect description of

what took place, and conveys no idea of the *solemnity* or *importance* of the proceeding. I can assure you it made a *most profound impression* upon me to witness so many foreigners, men of the highest scientific attainments, with one accord paying to the memory of my friend and fellow-countryman a tribute of esteem so justly merited.

But what pleased me still more was, their private expressions of regret. Had Dr. Marshall Hall been their personal friend, they could not have expressed more sorrow at his death. Such was the feeling manifested that I felt proud of being his fellow-countryman. At Paris also, the regret was equally profound.

It gave me extreme pleasure to read in the *Gazette Médicale d'Orient*, of December, 1857, a very able and just biographical sketch of my husband, executed with that talent which so peculiarly characterizes French writers. From this sketch, to which the name of R. Sarell* is attached, and which constitutes the *feuilleton* extending over seven pages, I make the following extracts :—

"*La logique sévère*, si remarquable dans ses expériences et ses théories scientifiques, se retrouve encore dans l'ordre qui a réglé ses études, et dans l'ouvrage où il en a marqué les développements successifs."

"Un second mémoire, 'Sur la vraie Moelle Épinière et le Système de Nerfs Excito-moteurs,' lu devant la *Royal Society*, ne fut pas admis dans ses Transactions; les médiocrités qui formaient la majorité au sein de cette Société n'ayant pas compris la portée des nouvelles idées émises par Hall. Privé de cette source de publicité dans son pays, Marshall Hall se tourna vers le continent, et écrivit à Müller une lettre devenue célèbre, dans laquelle il rend compte de ses expériences et appelle sur elles la critique de la savante Allemagne."

* To this writer, who is entirely unknown to me, I beg to tender my most heartfelt thanks for this tribute to my dear husband.

"Aujourd'hui qu'une controverse fâcheuse est complètement oubliée, le mérite de ses découvertes est partout proclamé."

"Ses idées, à peine émises, ont fait le tour du monde; cent esprits différents, dans autant de pays, s'en sont emparés aussitôt pour les soumettre à la critique la plus sévère. Si, après une si rude épreuve, son œuvre reste encore debout; si ses découvertes sont confirmées et complétées de tous côtés par des investigateurs indépendants, ses contemporains n'ont fait que dévancer le jugement de la postérité en lui décernant pendant sa vie les récompenses dues au mérite, et en inscrivant, après sa mort, son nom parmi les grands noms du passé. *Sit ei terra levis.*"

From New York the following most kind communication was addressed to me:—

Madam—I am directed by the Academy of Medicine of New York to forward to you the accompanying resolutions. Allow me to offer you my condolences on the loss which we, as well as yourself, have sustained.—&c. &c., J. W. GREENE, For. Corr. Sec.

Resolved—that the New York Academy of Medicine receive with sorrow the intelligence of the death of Dr. Marshall Hall.

Resolved—that we do but express the sentiments of the profession not only of this city but of the whole country, when we say that he was universally respected and admired in America, that we recognise the great indebtedness of medical science to him for his original investigations and their practical deductions, and that we shall not cease to mourn his loss.

Resolved—that a copy of these resolutions signed by the President and Secretary of the Academy be transmitted to Mrs. Marshall Hall.—VALENTINE MOTT, M.D., LL.D., President; C. F. HEYWOOD, M.D., Res. Sec.

The resolutions above were offered by Dr. E. H. Parker, and adopted at the meeting of the Academy held September 2nd, 1857.

I now proceed to lay before my readers a most interesting and important account from the pen of Mr. Wildbore of Brighton, who was so unremitting in his kind attendance on the beloved sufferer :—

My acquaintance with Dr. Marshall Hall commenced in the last year of his life, at a time when the malady of the throat which proved fatal had made great progress, and when he was looking forward with calmness and resignation to his death at no distant period. It is with great diffidence that I venture briefly to record my personal recollections of a man who ranks so highly in the original literature of our profession, and whose name must one day be classed with the Harveys, the Hunters, and the Jenners of science.

I called upon him early in the month of January, 1857, at the request of a mutual friend (Mr. George Pollock), to offer him such services as were in my power, and I can well remember how kindly and cordially he received me, and how soon we were in full conversation about his health ; and on leaving him he jocosely remarked, " I appoint you my Surgeon-in-Chief."

This my first visit left upon my mind a most pleasing impression which subsequent, almost daily intercourse confirmed.

It was his general custom to discuss with the medical friends whom he saw, the prominent symptom of his malady, the dysphagia, and to ask the number, nature, and termination of all the cases that came within their personal experience, and he then would inquire into the result of their reading on the subject. At our first meeting I told him of several of which I had full notes (one of them turned out to be a parallel of his own) ; all were fatal. I then discovered, and subsequent experience proved the observation to be correct, that it was painful to him to hear of incurable cases of dysphagia, although he seemed at all times anxious to elicit an honest opinion on the ordinary termination of diseases, of which this distressing

difficulty of swallowing was the prominent feature. That he was satisfied of the fatal nature of his complaint, I knew early in our friendship. He had told Mr. Pollock so in confidence before he left London, and soon after my first visit, he very briefly said the same to me ; but he entreated of me not, on any account, to alarm his wife or to express to her an unfavourable opinion.

Dr. Marshall Hall possessed a singular facility for imparting his own theories of the nature of his afflictions to others ; and, in some instances, I have heard of men of ability, after visiting him, expressing a conviction that the disease was functional, and that the symptoms could be accounted for on other grounds than those of organic disease.

He was always pleased with this sort of success, and for a time, after such a conversation, he was more hopeful ; but the hope rarely lasted long.

My impression at the time was that his great delight in these discussions was to cheer and comfort his affectionate wife, who was usually present, as they gave to her the opportunity of hearing all the favourable views that could be advanced ; for I knew that he earnestly desired to spare her all anxiety and to keep in the background the certain knowledge he himself had.

Twice during the long illness was Mrs. Hall abruptly told that nothing could save her husband, and the Doctor would often recur to the great unkindness of the revelations.

One of these occurrences took place when he was at Folkstone, and he was deeply hurt at the want of feeling displayed and by the abrupt and almost coarse language in which he was told that there was no cure for him. Often and often would he speak of this as one of the harshest observations ever made to a suffering invalid. Studiously careful of the feelings of others, his gentle nature was acutely moved by anything like unkindness to himself, and in this instance the pain was greatly increased by having the veil roughly torn away, under which he masked his disease and his sufferings in the presence of his devoted wife.

The *bonhommie* of his manner, his cheerful, cordial receptions, the hearty shake of the hand, and his ever-ready politeness, never forsook him during his long and distressing illness. His intimate friends and relations, deceived by his playful ways, his pleasant smile, and the interest he evinced in all little matters going on around him, scarcely credited the fact that he was fatally ill. Medical friends, as I have already said, were influenced to take a favourable view of the disease by his ingenious physiological arguments, and they only who closely watched him, and to whom he gave his full medical confidence, could fully estimate his state.

Within a few days of his death his mind was in full activity and vigour. Surrounded by his books and his manuscripts, he devoted many hours of the day to correspondence or to dictation; and it was his habit, as he told me, to think anxiously of what he had done and of those things which he yet hoped to accomplish. "It is very difficult," he would remark, "to originate anything new; after months of thought and many experiments, failure is too often the result; and a happy accident sometimes reveals the clue. It was very long before I hit upon the right mode of procedure for my ready method."

With much feeling he one day said to me, with tears in his eyes, "I am prepared to die, but I am not ready;" and then he continued, as if in explanation, "death has no terror for me, but there are many things I have yet to do which I could wish I might be spared to complete."

One day towards the end of May he remarked, "I think I shall live through the summer and to the end of the autumn perhaps, but the cold weather will destroy me."

Almost the last thing he did, when confined to his bed and exhausted from want of the nourishment he was unable to swallow, was to correct for the press the last pages of his work "On Drowning, &c." The preparation of this work had been for months his chief occupation and pleasure, and more than once, when I have found him propped up in bed at his accustomed work, did he say to me with a glowing, earnest countenance,

"Of all the things I have done for science, this one discovery gives to me more pleasure than all the rest. To save, to restore life, is a great thing to accomplish, and I believe that all stillborn children may now be saved; but a great deal yet remains to be worked out"—for which, alas! he was not spared.

How delighted he was at this period, at my almost daily visit, to hand me letters, probably just received, exclaiming joyously, "Read! another life saved! This makes the eighteenth," or twentieth, as the case might be. Then he would proceed with animation to comment upon the tact and perseverance of his correspondent in carrying out the new views to a successful termination, and the kindness evinced in forwarding the particulars. Little do his medical correspondents of that period imagine the great pleasure those letters gave the poor suffering invalid, who, whilst himself distressed with the cravings of hunger, harassed by the taking of small quantities of nourishment almost continuously, and impressed with the certainty of his own death being near at hand, was devoting all the powers of his mind to the development of a plan for restoring life to the apparently drowned, and for bringing to life the stillborn infant.

How thoroughly his heart was in this work, few but those about him know. It was, if I may so say, the pet child of his sick room, a subject always welcome and a source of increasing delight to him. A successful case reported by the post gave him a whole day's pleasure. "What should I now do," he would remark, "had I not acquired the habit of thinking and writing?"

After Dr. M. Hall had taken to his bed, he insisted upon going over with me all his experiments upon frogs; and he showed to me how, little by little, he arrived at the great results he had obtained in unravelling the nervous system; and he begged of me to do them all myself, and to write down the results.

His resignation throughout his distressing illness was most touching; a complaint or a murmur never escaped

him; gentle and kind to all around him, and considerate in everything for the feelings of others, he was beloved by all. But above all and before all personal considerations was the delicate solicitude he evinced to conceal from his ever-present, ever-anxious, tender and watchful wife (who performed the offices of nurse, secretary, and friend with a devotion worthy of the cause), the too certain conviction that life could not long be supported by drops of fluid swallowed with struggling and difficulty.

The indomitable energy of his character was in nothing more apparent than in the sustained and vigorous determination he evinced to take nourishment, even when it was required at intervals of fifteen or twenty minutes throughout the twenty-four hours.

That sad and long period of suffering is ever associated in my mind with the signal patience and Christian resignation with which he bore it, and the cheerful friendly smile with which he welcomed his friends.

It must have been apparent to every one who enjoyed much of his society, that he had a remarkably original mind; his observations were full of suggestions for thought, new and bright, and sometimes sparkling, spoken apparently without effort, and evoking playful arguments at the time, or sending his guests away with something to occupy their thoughts for the rest of the day. It was his delight to make persons *think*, and to impress upon all the important habit of close observation in the pursuit of science. Once he asked me what objects in nature had most excited my wonder and admiration? Hesitating in my reply, he continued, "The grandest sights I ever saw are three in number: Mont Blanc, as seen from the Jura; the Moon, through an observatory telescope; and the circulation in the web of a frog's foot, under a microscope."

I thoroughly esteemed the private character of my late friend; ample opportunities were afforded me of becoming very intimate with it, and the conclusion I always arrived at was, that he was not only a great but a good man.

The following account, written at my request, by Dr. Gibb, will, I think, interest the medical reader especially.

Portman Street, Portman Square, Jan. 23rd, 1860.

Dear Mrs. Hall—On the 28th of June, 1857, I first had the pleasure of an interview with Dr. Marshall Hall, accompanied by Mrs. Gibb. It was a very hot and sultry day. He seemed to feel the heat very much, but was able to converse in a loud whisper, and although apparently a sufferer, I was astonished at the brilliancy and vigour of his mind, and agreeably pleased with the easy and familiar manner with which he conversed. His method of putting questions, in respect to Mrs. Gibb's case, was clear and distinct, and showed the readiness, the intuitive facility, with which everything in succession suggested itself to his master mind. Our interview necessarily was not a protracted one, and in a short time he learnt from me all the particulars of my wife's state of health. He, however, requested me to furnish him with a written statement of her case, and gave me a copy of the third edition of his "Table of the Physiology of Epilepsy, and of Paroxysmal Apoplexy, Paralysis, Mania, &c.," as a guide in drawing it out. This was the last copy he had, as I afterwards learnt from himself, and I dearly prize it. It is one of the most remarkable productions it has ever been my lot to study, and every line of arrangement gives evidence of profound knowledge of the most obscure and hidden diseases. In taking our leave, on this occasion, it was with regret I departed, the desire to linger and to converse so strongly influenced me. But it shows the effect of first impressions, and proves the truth of the adage, that great and good men are always affable, kind, and truly sympathizing with those who suffer.

With the aid of the "Table" I was enabled to draw up a report with great facility, paying attention to the necessary and important points in Mrs. Gibb's case. In my next interview with him, on the 12th, he told me that, without making any foolish promises, he thought she would get well,

but it required time. He observed to me, that the particulars which I had transmitted to him formed one of the most able and perfectly drawn up cases which had ever come under his observation. This I particularly mention, because I take no credit to myself whatever in having done this, and informed him that it was the great assistance rendered me by reference to his "Table," that enabled me to make out a complete and careful report. At this time I observed a slight change for the worse, and he seemed easily fatigued. But when his mind was engaged, he was clear and discriminating. Conversation, as on the first occasion, was avoided to some extent by his using pencil and paper.

On the 3rd of August he looked very ill; a decided change had taken place for the worse; but he complained not, and gave me some directions relative to Mrs. Gibb's health. Our interview was short, and although now his great mind seemed to waver a little, still its vigour and clearness shone out. He was anxious for a few notes on pharyngitis as I had seen it in Canada. This was the last time that it was permitted me to see and converse with this good man, this benefactor of his species; for when I returned from a pedestrian tour to Hastings (the idea of which he seemed to relish before I started), and called at his residence, on the 10th of August, to leave an account of the pharyngitis, to my great sorrow I learnt that he was in a most precarious condition, and, of course, could not be disturbed. I afterwards heard that he died the next day.

My impressions can be understood, from what I have just related; they were of the most agreeable character, and the feeling has never left me, one of deep regret, as I expressed afterwards to some of my friends, that I had not been much longer acquainted with Dr. Marshall Hall. His conversation alone was pleasant and full of information. His mode of receiving a patient was kind and sympathizing, and he most readily entered into their feelings and wishes. Questions put in an easy and comprehensible manner drew forth answers without difficulty or hesitation; and if a cure was possible, he

held out reasonable hopes, on strictly attending, however, to his injunctions and prescriptions. I found this to be verified in the end, but only by implicit attention and careful regard to his directions. His prescriptions seemed to me simple, and yet contained much that was important, and I was much impressed with that given to strike at the root of Mrs. Gibb's malady. It proved successful in a hitherto incurable ailment, and completely changed its nature. His manner of conversing with a medical attendant was that of a friend, and he convinced the patient that every reliance could be placed upon his ordinary medical adviser.—&c. &c., GEORGE D. GIBB.

The letter which I next quote is deeply affecting. It is from the pen of a lady whom we have been privileged to number among our truest friends for more than thirty years.

My dear Friend—You ask for some recollections of our beloved friend; but though my mind is filled with pleasant thoughts and grateful memories of him, I feel that it is difficult to trace in words the deep impression he has left.

Perhaps were I to name the characteristic which impressed us most, it would be his genuine and almost childlike simplicity. Never before did I witness such a combination of all that was guileless and unpretending, with genius so acute, and power of thought so luminous. He appeared to have almost an instinctive faculty of leading to the cause rather than the effect; and a few simple words from him would often throw light on what had seemed a strange mystery before. I have sometimes thought that to the world in general, his very quiet, unpretending manner prevented his being fully appreciated.

No desire of popular fame, no love of distinction, ever tempted him to quit the toilsome but lofty career he had marked out for himself. Truth was the object of his most intense aspirations, and in this noble effort he became the benefactor of mankind.

Of him we may emphatically say—"His works do follow him." His name will be enrolled among those master spirits whom science and philosophy claim for their own; but I love better to think of him as the household comforter, the dear familiar friend, whose simple goodness tempted one almost to forget his intellectual greatness. On this subject, perhaps none can speak more fully than ourselves; for deep is the debt we owe and unfailing the gratitude we feel.

My eyes are dim with tears and my heart full, when I recal what he was to us in the dark days of bereavement.

How tenderly did he watch over the last hours of that fair child whose surpassing loveliness was so early faded! How deep was his sympathy, how gentle his care, for those who mourned over the one little lamb of their fold, the blighted flower of their once happy home!

Nor did his labour of love end there; for though health was gone and the brightness of life had vanished, we feel that, under God, his skill and care prolonged the days of another dear one, whose last prayers were for him!

Ah, dear friend, even now, in the hours of sickness and suffering, sadly do we miss the "beloved physician," who always brought comfort with him!

His words in a sick room were *few*, but *always wise*, and *good*, and *earnest*, and they *inspired confidence* which remained long after he had left us.

In happier hours, amidst the confidential intercourse of private life, there was a peculiar charm about him. Well do I remember those pleasant evenings when you sometimes came to pass a few hours with us! Those evenings are no more, but how vivid is their impression! The buoyant step, the cheerful voice, the cordial greeting, are still present with me. His native simplicity was then most touching. Though full of bright intelligence himself, he was always such a ready listener, and gave all the happy consciousness that he was really interested in the little details of our every-day life.

It is a great privilege to have had such a friend, and I

often recal with pleasure that the very last evening visit he paid us, he said that ours was the most homelike house he ever came to. I believe he had entire confidence in us; and now that "death has set his seal" on our friendship, it is delightful to feel that no cloud ever rested on its bright and happy current. However long might be the time of separation, the same kindly welcome always awaited us, and when we look around, we feel that his place can never be supplied to us; for where shall we find the wisdom of the sage united to the fresh-heartedness of a child?

I have certainly never known any human being with whom rank, or wealth, or any worldly distinction had less influence; and among his varied excellence I would not forget to mention the spirit of charity which pervaded his conversation. Even when suffering from the keen sense of injury and wrong, no word of harshness escaped him, and in his presence I have often felt self-condemned for speaking hastily of the motives or the conduct of others.

Philosophy, perhaps, might inspire his contempt for self-indulgence or ostentation; but surely it was a higher principle which thus taught him to keep his lips from evil speaking, and his tongue from guile!

Many grateful hearts, I am sure, will testify to the benevolent exercise of his professional skill, and among other instances I would mention his kindness to a friend of my own who, by a sudden reverse of fortune, was brought very low, and at the same time attacked by a fearful disease, for which the means of cure were far beyond her reach.

He not only proposed to take the whole case into his own hands, and supply skilful surgical attendance, but also offered her an apartment in his own house, where the operation should be performed, and the proper treatment carried on under his personal superintendence. This generous offer to a stranger was not accepted; but the gratitude it awakened was long and deeply felt. Of his unwearied diligence it is almost needless to speak; days of active duty were followed by nights of deep and earnest study.

I remember the last evening he ever came to us, he said that he had "work for ten years in his head." Alas! we little thought how near at hand was that "night when no man can work."

Amidst all these busy plans for the future, no one had a more perpetual sense of his entire dependence on God's permissive power. I remember going to his house to make an appointment with a friend, who was particularly struck by this, and used afterwards to say to me, I shall never forget Dr. Hall's D. V.'s.

How delightful the reflection that all these high intellectual gifts,—that unfaltering love of truth, those gentle virtues, those kindly sympathies, were all laid at the foot of the cross, by him who felt himself a sinner, and looked for salvation only to that Saviour whom unseen he loved!

On the 1st of November, 1856, I saw him for the last time, and, although aware of the fatal nature of his illness, his serenity was unshaken. Such a meek resignation, such a holy calm, were shed around him, that I felt it would be vain to speak of earthly hope or human consolation. After saying a few kind words to me, he was reminded that speaking was forbidden, when he took his pencil, and wrote on a small piece of paper—"I have passed three days and three nights in the valley of the shadow of death; I can tell you all that is there."

I was so deeply impressed and affected, that I could find no word of reply. One kindly pressure of the hand, one affectionate request that I would write often, and we parted. The farewell I came to say was never spoken.

Perhaps you may remember that my brother, to whom he was very dear, came afterwards to see him, and he, too, was powerfully impressed by the beautiful composure of his manner. As a philosopher it would have been sublime; but as a Christian it was God's most precious gift, that peace which the world can neither give nor take away.

We left with mingled feelings of love and admiration, but "sorrowing most of all that we should see his face no more."

After that time, I had some brief notes from him, which I place among my choicest treasures. In one he says, that to him "to live is Christ, but to die is gain." His only anxiety seemed that he must leave you behind; but on this subject I may not dwell.

I feel that I have very imperfectly fulfilled your request, my dear friend, and that I have made too frequent mention of myself; but in writing of an individual to whom I owe so much, it is difficult to efface one's self.—Always your affectionate friend, M—— W——.

The following is the reply of Mrs. F——, a kind friend to whom I had written, requesting her to send me any reminiscences which she could collect from the excellent servants of the house in which we lodged at Brighton :—

I have read your little request to poor Mrs. M—— and her good servants, and truly it warmed my heart to listen to the one sentiment pervading all. As to the gentle Elizabeth, she could scarcely speak, and you would have thought she had lost a father, whom she revered and loved beyond any other being upon earth. She spoke of the privilege of attending upon Dr. Marshall Hall, and of his unvarying, cheerful, calm, and kind manner, lamenting that she could not recollect any particular saying, when *all* were worth remembering; and then, with eyes full of tears, hastened out of the room, saying, "but *forget him, I never shall.*"

In her own simple, heartfelt way she said she hoped there would be a book about him, and she should save up her money to buy it. I often talk of past scenes with all of them, and poor Mrs. M—— is never tired of the subject, though it is very trying to her, and always ends in her weeping, because, through her blindness, she was unable to do anything for such a man. Since we came, she brought up an old newspaper giving the details of a young man at Southampton being restored after

having been ten minutes under water, by Dr. Wiblin, who used the "Marshall Hall method" for some hours.

My dear friend Dr. Fleetwood Churchill says in a letter to me, "I had the greatest respect for Dr. M. Hall, and there are few men whose reputation I should more covet."

The letter which next follows contains the valued reminiscences of a thirty years' friendship:—

My dear Mrs. Hall—I cannot permit the appearance of a memoir of your late valued and lamented husband without contributing a few observations, prompted by the pleasurable remembrance of an intimacy sustained for thirty years; during which period—no inconsiderable portion of human life—he was my medical adviser, my familiar friend, and, in a more exalted relation, my Christian brother.

The growth of the oak from the acorn is scarcely more interesting to me than the circumstances of our intimacy. The casual suggestion of a friend induced me, then living at some distance from London, to apply to your husband for professional advice. This was the acorn. You have witnessed its growth; there are few to whom its development can be so interesting as to yourself; indeed, there are few who could understand it.

Enjoying good health, which my children happily inherited, I had little opportunity of witnessing, in my own family, the peculiar professional character of my friend in the chamber of sickness. Yet, from our long and intimate intercourse, I had abundant opportunities of observing, what many of your friends experienced in their personal welfare, the keen and decisive detection of symptoms and the due administration of remedies, which mark the close observer and the ready prescriber.

But there must have been something unusual in the character of a man who could, without apparent intention, communicate an interest in his profession to one whose previous habits would seem to have precluded, if not the possibility, certainly the probability, of such an interest. I shall

never forget his playful remark, "In six weeks I could make you a good physician." I almost believed him, strange as it may seem, for I never had occasion to doubt him. But, though attaining, through his suggestions, a certain position in the medical profession, I did not become a physician. Had I been younger, I sometimes think I would have tested his encouraging, though still playful assertion. I could not have been in better hands.

Frequently have I remarked his sensitiveness of unacknowledged, or denied originality; and, in such moments, I have wished that his temperament had been that of Jussieu. Of him, Flourens remarked, "Il s'est laissé attaquer, à peu près dans toutes les langues, sans jamais répondre. Il disait que, s'il s'était trompé, il était tout simple qu'on l'attaquât; et que, s'il ne s'était pas trompé, toutes les attaques seraient bien vaines."—(*Eloge Historique*, 1838.) But, after all, this is a question of temperament, and, as a consequence, of certain ways of viewing things. Who shall decide such a point? Every great man must determine, not only his diagnosis, but also his prognosis, of moral actions and events.

Many have been the occasions on which I have needed a friend—to advise me in a difficulty, to remove a doubt, to explain a principle. For thirty years I have enjoyed such a friend—it was your husband. I cannot say how much I miss him. I could write you a little volume of incidents, of greater or less importance, all tending to the same result. But they are generally known to you, and would interest few others. One thing more you know, that these are not the words of a flatterer. Flattery is not truth, and aught but truth, connected with the name of Marshall Hall, would be an insult to his memory.

But the chief element of his existence was the confession of his faith. His was Christianity, pure and undefiled by the corruptions introduced and accumulated during eighteen centuries. A philosopher in all else, he was a child in his acceptance of the truth as it is in Jesus—his Divine Redeemer. Never, for thirty years, have I witnessed in him any hesita-

tion respecting the principles of Divine truth; the clouds which have gathered during that period, never obscured his vision of the real, unchangeable Source of light; and happy is it for you to remember that, in the hour of sickness and in the anticipation of his approaching change, he maintained his steadfastness and realized its consolations to the end.—I am, dear Mrs. Hall, your very sincere friend, RICHARD D. HOBLYN.

The following valuable sketch is from Dr. Hall's tried and faithful friend, Dr. Webster, of Dulwich:—

"It is hard to speak of him as he was, without seeming to adulate the dead."

Mrs. Marshall Hall has often requested me to write some reminiscences of her ever-to-be-lamented husband for his forthcoming biography. Probably next to herself, I knew him best and most intimately. Instead, therefore, of being among the last to reply to this call, I ought to have been the first to aid Mrs. Hall in her sacred duty, especially as I have always maintained that she, and she only, could justly depict the manifestations of his wondrous mind. I believe that she only could adequately delineate Marshall Hall as he was in his various relations of husband, father, brother, physician, and friend; and she entered so fully into the spirit of his scientific pursuits and interested herself so much in all that interested him, that I know her to be a competent judge of most of his researches and discoveries.

Perhaps a purely "scientific life" of Dr. Hall, as once contemplated, might have been more acceptable to the purely scientific reader, and it might have proved the best monument to his scientific and professional fame; but I know Mrs. Hall feared that such a work, which must partly have been controversial, would not interest the many,—the friends, the patients, and the public. Like a true wife, she cared less for the merely scientific or philosophic, and more for the general, the domestic, and the Christian features of her husband's character. On the whole, I believe she has decided rightly, for much of the history of Dr. Hall's private and social

life must have perished with herself; but his many professional improvements, and his numerous researches and splendid physiological discoveries can never be lost; they exist in his published works and in our medical literature—they are every day becoming more and more familiar to us, and I have no doubt that before long a new and collected edition of his works will be called for, and necessitate a scientific history of "The Life, Labours, and Discoveries of Marshall Hall."

I feel some difficulty where to begin or how to write of my departed friend—not from the paucity but the redundancy of materials, and the more so that my pen having been employed on his living biography, I do not wish to retread the same path.

My knowledge of Marshall Hall began as far back as 1812, in the Royal Infirmary of Edinburgh, though we were then and for years after unknown to each other as friends. He had recently graduated, and was one of the Clinical Clerks (or house physicians) during the first two years of my studentship at the university. I need not enter into details, but I can amply confirm all the accounts which may have been received of Dr. Hall's diligence, assiduity, and tenderness in discharging the duties of his responsible office. His mode of performing these important duties, and his general character and bearing must have made a strong impression on my mind; for after I was settled in this locality, and read the medical periodicals of that day (few and far between as they then were), whenever the name of Marshall Hall appeared at the end of a case, or at the head of a paper, I perused it with a thrill of pleasure as the production of one not altogether unknown to me, and who would soon distinguish himself in our profession. In this way I was aware of his career in Nottingham (his native place) for ten years, and of his settling in London with a well-founded reputation from his extensive provincial practice, and from his works "On Diagnosis," "On the Effects of the Loss of Blood," &c. &c.

Our first introduction took place in Keppell Street, in 1826, and as the circumstances were rather peculiar and indicative

of the Doctor's character, I mention them here. At that time I had an anxious case in hand of a free liver with chronic gout and dropsy. I advised my patient to take two or three opinions in London, to which he agreed, and I accompanied him to town, having recommended Dr. Hall as one of our consultants.

The first gentleman on whom we called was from home, but we found Dr. Hall, who, after a short examination, asked me whether I was a medical man, for I had purposely not sent in my card. On my replying in the affirmative, he said, "This is an interesting case, and requires to be carefully investigated. I have an appointment at this hour, and have only time to drive to it; do you live near this, for as I cannot do justice to your patient to-day, I would call on you to-morrow or next day, if agreeable?" On my informing him that I resided at a distance of six or seven miles, and could not expect him to go so far, he replied, "Oh, that is of no importance; I am only just come to town, and my horses and carriage have not too much work yet." This proposal surprised and gratified both my patient and myself, as I knew that some physicians would have hurried over our consultation to keep an appointment previously made. Accordingly he met me in two days, and so carefully examined our patient, that I was struck with his conscientious and minute attention to every point of the case. He then most readily, and without ceremony, came home with me and sat down to our family dinner as if he had been one of ourselves. It was impossible to be in Dr. Hall's company without perceiving that he was a man of a very superior mind and full of intelligence; and his playful, pleasing manner won so much upon us, that we parted from him with regret. From that time began a friendship which lasted uninterruptedly for thirty years, and which was only terminated by his lamented decease.

The points of Dr. Hall's general character which most attracted my attention were—1st, the extreme simplicity and purity of his tastes and manners; 2nd, his great amiability and constant desire to give happiness to others; 3rd, the stern truthfulness and integrity of all his proceedings; 4th, his

manly independence, and firm opposition to injustice and oppression.

Dr. Hall had the inestimable advantage of religious parents, and never was that Scripture more truly exemplified, "Train up a child in the way he should go, and when he is old he will not depart from it." Religion was the foundation of all his subsequent education, and this produced a purity of life and conversation, both in youth and age, such as became the Christian philosopher. As in early life he chiefly resided in the country, his mind, always powerful, became stored with facts in natural history; he was a lover of nature and of beautiful scenery, and when he settled in the great Babylon, even a short glimpse of the country, as at Dulwich, quite delighted him, for he always felt with the poet, that "God made the country, man made the town."

His tastes in everything were simple; his diet, his dress, his furniture, his carriage, &c. In conversation also he used the most simple language, so that a child could readily understand him, and as children and young people always attracted much of his notice, he was greatly beloved by them. Nurses and patients had no excuse for neglecting his instructions; they were given so clearly, intelligibly, and concisely, that it was impossible they could err. His manners were also most simple and unpretending, which at once placed his patients and strangers on an easy and familiar footing with him; he thus disarmed their fears, while his great attention to symptoms, and the marked interest which he always showed for the case in hand, secured the confidence and esteem of those who came under his care. He had certainly nothing of the pompous or solemn manner which we attribute to the physician of half a century ago. An illustrative anecdote was mentioned to me by a friend many years since. A rich old lady in the country was recommended to have Dr. Marshall Hall down from London, where he had recently settled, to a consultation on her case, which was not a very dangerous, although a troublesome one. She had been accustomed to the "big wigs," if not to the gold-headed canes of former times, and her countenance

expressed no little astonishment when, instead of "the solemn pace and slow," Dr. Hall, as was his wont, approached her bed at a rather quick step and with a cheerful face, asked her a few plain, straightforward questions, by which he mastered the nature of her malady, gave the nurse his precise directions, and quickly retired with her medical attendant. The patient expressed to her surgeon her amazement at such unceremonious conduct, and felt some indignation mingled with great doubt as to any good effects from what she called the visit of "that boy!" The effect of the treatment prescribed soon convinced her of her prejudice, and that his practice was at least as successful as that of any of the "old boys" who had previously attended her, and she was his firm friend ever after.

Dr. Hall possessed great amiability and a happy equanimity of temper. I cannot remember, in all my long intercourse with him, having ever seen him angry or even fretful. I have known him to be vexed and annoyed, and frequently disappointed, but nothing ever soured his temper. He always met you with a smile, a warm welcome, and a *firm* shake of the hand, which conveyed the kindly feelings of his heart. He was always a happy man, because he was a good man, and his greatest delight was in making others happy. He was fond of planning some little excursion, or meeting, for the pleasure of his friends, or for the instruction of the young. When I first knew him he had several nieces at school at Brixton,—the daughters of his sister. Nothing delighted him more than to call for these young ladies on his way to my house, and it was a standing joke to find how many of them he could *pack* into his carriage, in addition perhaps to a friend or two from London! We sometimes thought that he had acquired the conjuror's art, to squeeze so many bodies into so small a space. In after-times, Mrs. Hall and his son almost always accompanied him, and not unfrequently some philosopher or *savant* would be of the party; and many a learned discussion was carried on by the doctors in the house, while the lady and her boy joined my wife and children in the garden. At other

times the *literati* would adjourn to the lawn and join the children at bowls, and none ever enjoyed the game more than Dr. Hall himself. Not unfrequently, in fine weather, we all had a stroll in the fields of this beautiful neighbourhood, and then the tadpoles, and frogs, and efts, and dragon-flies were eagerly sought for to supply subjects for experimental science in London, where I had the advantage of joining the *séances*, and witnessing many of Dr. Hall's experiments, when my engagements would permit. I look back now on these many happy meetings, both here and in London, with a hallowed and regretful pleasure.

But perhaps the most distinguishing of all Dr. Hall's characteristics was, as I have said, a stern truthfulness and a sturdy independence in everything which he said or did. He was a steady and unflinching supporter of truth and justice, at whatever cost of time, trouble, or money! *Expediency* was a word which existed not in his vocabulary. Hence perhaps might have arisen a charge which I have known brought against him of pugnacity and pertinaciousness, by those who only knew him superficially. There was not really a particle of pugnacity in his disposition, and I do not believe that he ever attacked any one, or was in any single case the aggressor. His pertinacity was for the truth, and in defence of himself and his discoveries. Indeed veneration for truth, simple truth, was inwoven with Dr. Hall's nature as well as part of his religious creed. I say the simple truth—because he repudiated *oaths* in every shape or form, as contrary to Christ's command. He interpreted the Saviour's injunctions, "I say unto you, swear not at all," and "Let your communication be yea, yea; nay, nay; for whatsoever is more than these cometh of evil," as binding on all Christians, and quite as applicable to the judicial oaths of the present day as to the rash vows of the Jews. While he thought that for oaths a simple form of words should be substituted, he regarded words, and especially his own words, as if they were oaths; and he braved the dread of imprisonment, and incurred the loss of property, rather than take an oath, and so sanction and practise that which he con-

sidered to be wrong. In all his experiments, therefore, and in all the statements of his discoveries and doctrines, he wrote nothing carelessly, or which he did not most conscientiously believe to be true. If anything was not proved or not sufficiently clear to his own mind, he suggested a doubt or put a query. With this sensitiveness and regard for truth, it is not surprising that Dr. Hall should have keenly felt the attacks made, in anything but a generous spirit, by part of the medical press, when he first published his discovery of what may be truly called a Third System of Nerves—the true Spinal or Diastaltic. The torrent of opposition which assailed the infant discovery was remarkable even in the history of discoveries. It was at first boldly asserted to be no discovery at all! Then it was as ancient as the fathers of medicine; at least as old as Whytt; and clearly shown by Prochaska, from whom it was at last said to have been *stolen* without acknowledgment!

Most men would have been appalled and disheartened by such treatment, not only from editors and compiling physiologists, but also from societies instituted to promote science, who did all they could, not to encourage and reward, but rather to discourage, one of the most brilliant physiological discoveries of the age. The attacks on Dr. Hall's veracity, for such he viewed them, only roused him to greater exertion; he worked on more earnestly than ever; he multiplied his experiments, and continued his researches, while with his ready pen he defended the truths he had already established, until, step by step, he surely and clearly developed the beautiful system of the true spinal nerves. Indeed he rested not until he had traced the "Excito-motory" principle through its anatomical, pathological, and therapeutic relations! But I am incidentally trenching on the department of one who will do this subject far more justice than I can pretend to.

Dr. Hall was not properly understood by many of his professional brethren in London. He did not mix much in their society, because he was by far too much occupied with the science of the profession to cultivate its trade; and he was of too noble and independent a spirit ever to stoop to anything

that savoured of the mean or the petty, or to any sort of "cliqueism" to gain the good opinion of any branch, whether of the aristocracy or the republic of medicine.

No one could be more hospitable at his own table, nor give a warmer welcome to all comers, whether countrymen or foreigners, than Dr. Hall; but a formal dinner party he disliked, and he never gave set professional dinners, especially to general practitioners by way of cultivating their good graces; yet I am inclined to believe that he was, at first especially, much more appreciated, and more truly estimated by them, than by physicians and surgeons in consulting practice. There was, however, a peculiar exception in this respect. Dr. Hall was not seldom called to attend upon, or prescribe for, the "heads" of our profession, as they are called, and their families, who gladly availed themselves of his advice and skill, though they rarely recommended their friends or patients to follow their own example. This unbiassed and best of all testimonies to the talents and practical abilities of Marshall Hall is the more valuable because he could not be considered a favourite with all our professional magnates. This can be readily explained, and depended on several circumstances. To say nothing of the opposition which his discoveries naturally (or rather I should say *unnaturally*) aroused, and the jealousy and envy which ever attend superior talent and merit, Dr. Hall was not a London man; he was not educated in a London medical school; he had formed no early London associations or friendships; he did not permanently attach himself to any London hospital; he belonged to neither of the great Church and State universities! in short, he was merely a provincial man, and had taken the bold and almost unpardonable step of invading London with only a high provincial reputation. I have known not a few cases of such translations of provincial physicians to London, but they have rarely succeeded; perhaps Dr. Armstrong and Dr. Hall were the only two, during the last thirty or forty years, who achieved fame and fortune, exclusive of one or two Royal physicians, who cannot be classed in the same category. Dr.

Hall's own talents ensured his success, for he derived comparatively little aid from his professional brethren.

Marshall Hall was a man of undoubted genius and originality. He could not otherwise have impressed himself so strongly on the medical literature and opinions of our times. This I believe he has done in a much greater degree than has yet been allowed. It is marvellous, indeed, that one man could have done so much in this respect, and so much actually as regards the number and importance of the subjects which engaged his attention. I know of no one who has done half so much for medicine and physiology during the present century, and there is only John Hunter with whom he can be compared in the last! Everything which Dr. Hall undertook had a *practical* tendency, though he has been accused of being a mere theorist! because of his many beautiful physiological investigations. He once said to me, when consulting on a most anxious and puzzling case of brain disease, "After all, *diagnosis* is everything in our profession;" and at the very outset of his career he had the sagacity to perceive this: hence he took this subject for his first work—the result of his observations in the Royal Infirmary of Edinburgh. Diagnosis, or the accurate distinction of one disease from another, was the foundation of all his success, and he kept it steadily in view in his medical practice and in all his researches.

The work, or paper, which brought Dr. Hall into greatest notice in his early practice was that "On the Effects of Loss of Blood." It at once arrested the attention of the profession, and for the first time clearly showed the difference between irritation in its many forms, and inflammation, particularly in the puerperal state. Bleeding was then the almost universal remedy for every pain, and for every symptom of excitement of the brain, or increased action of the heart. It was no matter what the cause might be, the remedy was the same, bleeding! bleeding! The quick pulse, the aching head, the throbbing temple, the intolerance of light or noise, were all attributed to inflammation! It might be that all these symptoms were actually caused by loss of blood, either natural or

artificial, or by exhaustion alone; still the remedy was to bleed! in other words, to add fuel to the fire that was already destroying the fabric!

Dr. Hall has the great merit of being the first to stem the torrents of blood which were so ruthlessly and sometimes so fatally shed! And how did he accomplish this? Not by crude theory, but by close observation of symptoms, and accurate knowledge of diagnosis. All honour to his name, if he had done nothing more! He soon after continued his work of humanity on this all-important subject, and published "On the MORBID Effects of Loss of Blood;" and completed it in his paper and book "On the Due Administration of Bleeding" and "On the MORBID and CURATIVE Effects of Loss of Blood," in which he establishes a simple, safe, and admirable rule for blood-letting, from its *tolerance* in inflammatory, and its *intolerance* in other diseases. Those who follow Dr. Hall's rule will never bleed too much, those who do not, may even in these days bleed too little!

Then followed in the same wake his admirable work entitled "Commentaries on the Diseases of Females"—a book too little studied. It is not my intention to remark on *all* the works and papers of Dr. Hall. I must refer for even their names and titles to the catalogue of them. He wrote and experimented on many subjects; he took up none which were not important, and as Johnson said of Goldsmith, "he touched none which he did not improve and adorn."

But Marshall Hall's name and fame will be known chiefly in after ages in connexion with the nervous system. His splendid discovery of the true physiology of the Spinal Marrow, with its beautiful explanation of many of the laws of life and disease, and its extensive *practical* application to medicine, will rank him with Harvey, Hunter, and Jenner. I have adverted to one phase of the almost unexampled opposition which met the announcement, and the various details of his researches; but at one time he feared that the clamour of critics and the outcries of mere handbook physiologists would actually have strangled his young discovery; and but for the

firm support of the *Lancet* and independent press, this might have happened, at least for a time. In desponding mood he would detail to me what he considered the unjust treatment of scientific societies and of reviewers, and more than once I was obliged to remind him that FACTS FOUNDED ON TRUTH COULD NOT BE DESTROYED ! that sooner or later they must and would prevail. I preached patience to him, which sometimes scarcely suited his ardent disposition, until I quoted the names of Harvey, Galileo, the Marquis of Worcester, Jenner, Franklin, &c., and the opposition which all their discoveries encountered. He would leave me, comforted and encouraged, to continue his interesting labours. Time removed prejudice and opposition, and truth did prevail, so that Dr. Hall lived to enjoy the full recognition of his great discovery, even in his own country, where the prophet proverbially hath no honour, and where, with shame be it spoken, no honours were ever conferred upon him, with one exception, that of an honorary diploma from the Royal Medical Society of Edinburgh a few weeks before his death, which highly gratified him as coming from the scene of his early aspirations. On the Continent and in America his works and discoveries were ever received with respect and admiration, and their scientific societies vied with each other in bestowing upon him their choicest honours. He valued the Membership of the Institute of France as the highest among these, because no second-rate physiologists were admitted there !

Dr. Hall not only witnessed the acknowledgment of his discoveries, but also the adoption of his scientific terms, which at first sounded rather harshly, such as excitor, inexcitor, excitomotory, reflex-function, diastaltic system, methæmatous vessels, trachelismus, laryngismus, apnœa, &c. If he did not *invent* every one of these terms, he familiarized them to our ears, so that they are now become like household words. His style was terse, clear, and distinct ; he always employed the fewest possible words to convey his meaning, and some of his scientific works are almost aphoristic. Perhaps the most interesting of his later works are the two volumes entitled

"Practical Observations and Suggestions in Medicine." They contain many of his papers which appeared in the *Lancet*, and others which he had prepared for publication. They are beautifully written, very suggestive, and full of most important matter. None of his works show so clearly the vast variety of subjects which emanated from his fertile genius and prolific pen. I commend them to the studious attention of the young practitioner, but they will amply repay the perusal of every class of readers.

The last, and by no means the least important subject which engaged Dr. Hall's active mind was that of asphyxia, or rather, apnœa, as he termed it, undertaken with the sole view of promoting the benevolent objects of the Royal Humane Society. He made many experiments, some of which I witnessed, and they resulted in the now well-known "Ready method," or "Marshall-Hall method" of restoring animation to the apparently dead or drowned. Like his discovery of the diastaltic nervous system, this has been doomed to meet with opposition and discussion in certain quarters; and it is curious to notice the caution and distrust with which this boon to humanity was received by the Royal Humane Society, while it was adopted by the profession almost with enthusiasm, and by the "National Life-Boat Institution," so as entirely to supersede the old rules, with the indiscriminate use of the warm bath, or the attempts to restore circulation before respiration.* I leave this subject, however, in the hands of one well able to do it justice, only observing that it occupied the thoughts of Dr. Hall to the last day of his life, and it cheered his dying hours to receive testimonies of the

* Since writing the above an unworthy attempt has been made at the Medico-Chirurgical Society to "burk" the "Marshall Hall method," which signally failed. On the other hand, some most interesting experiments by Dr. Waters, of Liverpool, confirm Dr. Hall's views as to the danger of the warm-bath, and the efficacy of the "Ready method" (see the *Lancet* for May 25th). I have proposed that the British Medical Association should appoint a committee, with a pecuniary grant, still further to investigate, and, if possible, settle this most important, but, I believe, unnecessarily vexed question.

efficacy of the "Ready method" from all parts of the kingdom. His last letters (dictated) to me were *on this subject* and on his own sad malady.

I have not yet alluded to the great benevolence of Dr. Hall's character, and his abhorrence of all manner of injustice and oppression. If a friend were calumniated or persecuted, he would rush to his rescue, at whatever cost of obloquy, censure, or trouble to himself. I mentioned to him once the case of a professional brother, a stranger to us both, who seemed to have been wrongfully accused, and would be ruined by the loss of a public office which he held; his reply was, "Let us stand by him and protect him!" In another case, where it was important to gain the patronage of a minister of the Crown to serve a friend, his observation was, "Let us *resolve* to obtain it, and we shall succeed." I could mention many cases which engaged his active sympathy and benevolent exertions, and he spared no trouble to attain the end in view, whether it were to assist the distressed or to promote the interests or welfare of others.

With this feeling, when Dr. Hall was about to proceed to America for his health in 1853, he was most anxious to be of some use to the poor Negro. He called on me several times to discuss this subject, and we both agreed that it was not the slavery of the slave alone that was the only crying evil in America, there was also the slavery of colour in the Free States. It was concluded that he should judge for himself when in the far West, and write to me his opinions with a view to the publication of such a plan of amelioration as on the spot he might find to be best. I received many interesting letters from him, and opened a correspondence with the celebrated Dr. Wardlaw, of Glasgow (who had just then invited the authoress of "Uncle Tom's Cabin" to Scotland), with the view of enlisting Mrs. H. B. Stowe's sympathy on some points of this great question. On his return from America Dr. Hall published his views and a well-considered plan of self-emancipation, in a most interesting little volume entitled "The Twofold Slavery of the United States," a work full of statistical and other information, which

is particularly valuable at the present moment. How would he have rejoiced, had he seen "*the beginning of the end*" of slavery, which we now anticipate, from the disunion of the United States. The same spirit of resistance to all oppression and persecution no doubt determined the general as well as the medical politics of Dr. Hall. He was a Liberal, in the best sense of the word, in all his feelings, opinions, and practice. He was one of the staunchest friends of Medical Reform, and an ardent supporter of the cause during our struggles with the colleges and corporations from 1838 downwards, when I had the honour to preside over the British Medical Association, with such men in our Council as Grainger, Liston, Grant, Farr, Granville, Pilcher, Harrison, and a long list of other worthies. Dr. Hall delivered the annual oration in 1842, which contained those liberal and enlarged views for which he was distinguished, and he ever felt a warm interest in all that concerned the polity of his profession and the rights of its members. He ever considered knowledge the best antidote to all quackery and empiricism.

I think I may with truth say that Dr. Hall had not a spark of envy in all his nature; while he defended his own discoveries with all the zeal of his character, he was scrupulous in rendering to others the merit which was their due; he could indeed well afford to be generous in this respect, and he never claimed that which did not belong to him in any field of research. There was a manly independence about Dr. Hall which induced him to express himself boldly and honestly at whatever consequence. If any one injured, or ill-treated him, or charged him wrongfully, he would not brood over the matter, but give expression to his opinions, and having done so, he dismissed the subject from his mind; but he was rarely satisfied until this was done, and he always considered it his duty to *protest* against injustice, whether to himself or others, when it could not be rectified or resisted.

While some perhaps in the medical profession (critics, reviewers, and rival journalists, who occasionally stir up a little harmless strife, or like to promote warm discussions) might

affect to consider Dr. Hall as at times over-sensitive or pertinacious, I have had many opportunities of knowing that the truly liberal and really great men in our ranks, and the scientific out of them, men of genius and of kindred minds, always spoke of Marshall Hall with the highest respect and admiration as our greatest physiologist. At his own earnest request, and towards the close of his fatal disease, I undertook to collect information, and to obtain the opinions of some of our most eminent authorities, respecting a particular mode of treatment in the painful malady which carried him to, I may say, a premature grave. I shall never forget the warm sympathy and solicitude evinced by all, when I explained my mission, and the earnest attention which they gave to the case. Among others, I called on the present illustrious President of the Royal Society, whom Dr. Hall had consulted at an early period of his disease. He at once, and in the kindest manner, entered carefully into the subject, and lamented, with myself, the prospect of the early departure from amongst us of one so eminent. I believe I betray no confidence in recording the words of Sir B. Brodie as we parted. They were alike honourable to himself and to our friend—"Well! Marshall Hall has earned for himself a high reputation and a great name!"

Were it necessary, I could write much more on the character of this distinguished physiologist and physician, though I am painfully sensible how inadequately I have illustrated my subject or expressed my own feelings, but neither time nor space will now permit more than a brief summary.

To genius and originality Marshall Hall added great industry and perseverance. He was honourably ambitious of distinguishing himself by some boon to humanity or service to his profession; his wishes were amply fulfilled. He delighted to scan the wide field of science, or to contemplate nature's mighty works; but he especially excelled in close and minute observation, and in deductions which led to general results. Newton, from so trifling a circumstance as the fall of an apple, traced the laws of the universe. Marshall Hall, from witnessing the excited move-

ments of a separated portion of a salamander's tail, discovered the true spinal system and its laws, with its excito-motor and reflex actions in ingestion, egestion, the preservation of the individual, &c. He possessed the inventive and improving faculties of others of his family, and he excelled in whatever he undertook. His mind was peculiarly suggestive and fruitful in practical results. His perceptions were keen, vivid, and diagnostic, and he was fertile in resources. He was a lover of truth and justice, abstractedly and practically; a hater of injustice and oppression, whose victims ever found in him a warm advocate. Like most men of genius, he was sensitive, quick to feel, and quick to defend himself or others; but not hostile nor aggressive. He ever rendered their due to his scientific fellow-labourers, and rejoiced at their success.

In all the domestic and private relations, Dr. Hall was eminently what a son, a brother, a husband, a father, and a friend should be. He was adored by his family, and beloved by his friends—his loss to them is unspeakable. His manners were artless and cordial, his habits and tastes simple and pure, his conversation always instructive, though seemingly playful and amusing. He was greatly blessed in an affectionate son, and in a wife peculiarly suited, by education, virtues, and intellectual endowments, to be his companion in life and his biographer after death. In a word, she was worthy of him.

GEO. WEBSTER.

P.S.—When time shall have removed all prejudice and hallowed the memory of Marshall Hall, some lover of science will doubtless think of doing honour to himself by proposing to raise a public monument as a just acknowledgment of the brilliant discoveries and labours in the cause of humanity, of that great man! But why should two hundred, eighty, or even forty years elapse, as in the cases of Harvey, Hunter, and Jenner, before due honour be rendered to our mighty dead!

Let those who loved him, and those who opposed him, magnanimously join all who admire genius, talent, and merit, in setting an example worthy of these better days of science and

discovery. Let us *at once* combine to raise a monument in Westminster Abbey or St. Paul's Cathedral, to show to the public and to posterity that in the latter half of the nineteenth century, even the medical profession could unite in appreciating the merits of a recent contemporary, and in doing honour to the memory of Marshall Hall, the discoverer of the Diastaltic Nervous System.

I PROPOSE THIS IN MEMORIAM.

G. W.

Dulwich, April 22nd, 1861.

APPENDIX.

I.

STATEMENT OF DR. MARSHALL HALL'S CASE.

Written from his Dictation, and sent to Mr. Paget of Bartholomew's Hospital, July 22nd, 1857.

1. ABOUT eighteen years ago, after too much lecturing, a degree of hoarseness, which induced Mr. Guthrie to say I had the "clergyman's throat," and to advise me to give up lecturing.

2. Some time after this, I first perceived that particles of food were retained in my pharynx for several hours after taking meals, and even, occasionally, during the whole of the night.

3. After this, I became a little liable to choking during eating, with dislodgment of portions of food from the pharynx. My pharynx also became very excitable, and I could not drink a draught, of cold water for example, without choking.

4. About ten years ago, my throat became rather worse, and I consulted Dr. Chambers and Sir B. Brodie together. The former passed the stomach tube and discovered no lesion. The latter proposed the valerianate of zinc.

5. After this my health continued as usual until the end of 1852, when I perceived purple spots on my ankles, and was induced to make a tour through the United States.

6. During this tour I experienced brow-ague at New Orleans and again at Havana, which I removed by large doses of quinine. My spots gradually disappeared, and I was in my usual health.

7. I returned to England, and remained in good health. We spent the winter and spring of 1855 in Italy, and the ensuing summer in Paris.

8. The following winter was spent in London, and during that period I first observed a little *hawking* of blood, which chiefly appeared during dressing, or quick walking, or exposure to the cold, and I had a very slight bronchitis.

9. In the summer of 1856, my dysphagia became decidedly worse. In October I caught cold and had a severe attack of bronchitis, the expectoration being coloured with blood. I was confined to my bed for several days, and then I observed, for the first time, unusual loss of flesh and strength, which I afterwards recovered under a diet of milk and cream (coffee).

10. Early in November I came to Brighton. The weather was unfavourable, and I again took cold, and was compelled to remain in bed for nearly a week.

11. After this, I remained *extremely* susceptible to cold. Every unfavourable change in the weather augmented my dysphagia, and I struggled on thus till March.

12. March, with its severe winds, nearly destroyed me. Every symptom was aggravated (without, however, the usual appearance of having *taken* cold), but especially my dysphagia, with much *hawking* of white frothy mucus. I was compelled to betake myself to bed, in which I was detained fourteen long weeks. I had evening fever, dryness of the throat, mouth, and nostrils, with heat of the skin, followed by perspiration and *great* loss of flesh and strength. I used aperient and nutritive enemata.

13. During the whole of this period, I kept continually asking my medical friends, "Can this be remittent fever?"

14. I made a little progress during the beginning of the month of May. But about the middle of this month I experienced severe attacks of intermittent fever, violent rigor, followed by intense heat, and this by profuse perspirations. My dysphagia was variable, and about the beginning of June, for the first time, I was able to eat a little meal of meat and asparagus three or four days consecutively. The weather

then suddenly changed to stormy, and this good was all undone. My ague-fits were repeated with great violence. I had all along been taking quinine, but now I took it in large doses; after which I had several paroxysms without rigor, but with great heat, perspiration, and debility, and anorexia, of which the last occurred last night.

15. I am now (July 22nd, 1857) living entirely on milk, having neither power (as I imagine) nor inclination to take any other kind of food.

16. Every feverish paroxysm reduces my flesh and strength.

17. I have hitherto taken the quinine in the form of enema, with beef-tea, daily (in a dose which makes me and keeps me deaf), on account of the excitable state of my pharynx. My present dose is six or nine grains.

18. I have not tried the Liquor arsenitis potassæ.

19. The anterior part of my neck is apt to be tender under external pressure. It is very little so just now, from the assiduous use of the Comp. camphor liniment.

20. I have not seen a dot or streak of blood in the sputa for the last three months, with one or two *very slight* exceptions.

21. There is no external swelling of the neck, or anything visible in the fauces, nor does the stethoscope detect anything in the thorax. With the tenderness there is, however, a little tumefaction of the parts in front of the neck.

22. I constantly experience a sense of burning pain at the upper part of the pharynx. This appeared to me to be augmented by six several applications of the nitrate of silver, in the proportion of seven to eight grains of the crystals to one ounce of water. I therefore discontinued it, and since then I think my soreness has been rather less severe than before.

23. Once, on attempting to pass an œsophageal tube, I thought I experienced a little resistance about the lower third of the neck.

24. In the severest part of my illness, in March, I was certainly in great danger of sinking from extreme debility. All along I have been disposed to ear-ache, especially of the right

ear, and tenderness of the eyeballs, with a little exudation from the ciliary glands.

25. In the beginning I took the ioduret of potass.

26. I have not taken the bichloride of mercury.

27. What may be hoped from change of air? The climate of Egypt, or a sea voyage?

28. I had myself thought of a stove-warmed atmosphere, and mild, tepid shower-baths. My susceptibility to changes of temperature is extreme. My loss of flesh and strength has always been under the influence of an attack produced by cold, and not slowly and progressively. After the attack has subsided, I have recovered more or less. Although I take milk, I cannot take bread or anything mixed with it.

THE POST-MORTEM.

The examination of the body was made by Dr. Ransom, of Nottingham, thirty-eight hours after death, in the presence of Dr. Hutchinson, Dr. Robertson, Dr. T. Wright, Mr. Higginbottom, Mr. Eddison, Mr. Wildbore, and Mr. M. H. Higginbottom; the record being made by Dr. Ransom.

The body was emaciated. No external marks of decomposition.

Thorax.—The lungs did not collapse on the cavities being opened. The right one was universally adherent by old adhesions; the substance of the lungs healthy; no pleuritic effusion.

The pericardium contained nearly two ounces of dirty red fluid. The heart was flabby (perhaps from cadaveric changes); it contained frothy blood in the right ventricle and auricle. The valves were competent. There were some slight ætheromatous deposits on the inner surface of the aorta, which was stained a deep red.

The bronchial glands were larger than usual, soft and black.

On making examination of the parts higher up in the throat, it became evident that some undue thickening and adhesions existed behind the larynx. The latter was therefore removed, with the pharynx, œsophagus, and trachea. In doing this, the intimacy of the adhesions necessitated that the

knife should be carried close to the bodies of the corresponding vertebræ; with every care, however, button-holes were made in two or three places. On removal, it was seen that the walls of the pharynx were extremely thin, and that its cavity was dilated. Through the openings made by the knife there escaped a dirty-brown, flaky fluid, of a creamy consistence. The adhesions were to the bodies of the sixth and seventh cervical, and first and second dorsal vertebræ.

The parts removed, when examined, showed a stricture of the œsophagus, about the level of the eighth ring of the trachea, and a dilatation, with ulceration and vasculation of the œsophagus and pharynx above the stricture, to the extent of nearly three inches. The stricture was attended with but moderate thickening of the tube, and the aperture was not very small, but the membrane was folded in, so as to present a conical eminence upwards, the apex of which was opposite the narrowest part of the stricture, which was here rather larger than a goosequill. In this way, the passage was almost valved, and food would have had the tendency to pass down by the sides of the eminence into the pouches and sacculi of the ulcerated portion. Indeed, the finger passed down from above, previous to opening the œsophagus, could not enter the passage, though a similar difficulty did not exist if the finger was passed from below the stricture. The upper border of the ulceration was on each side about level with the bases of the arytenoid cartilages, but did not extend so high in the middle. The dilatation was throughout irregularly ulcerated, soft, pulpy, ragged, of a dirty-grey or slate colour, and with a few loosely-adhering flakes on its surface. Its base was not much thickened, though here and there it was somewhat so, and felt firmer in such parts. The walls of the pharynx and œsophagus were perforated in several places, leading to pouches or sinuses among the muscles of the neck, having very thin delicate walls of false membrane. Two of these pouches were very large, and ran upwards on the outer surface of the thyroid cartilage, one on each side, as high as its upper border, the right pouch being the largest. A narrow slip of mucous membrane re-

mained at the back of the trachea, but this at the lower extremity was quite undermined.

At the lower part of the dilatation the ulceration had nearly perforated the trachea through the posterior membranous wall, and had set free the right extremities of the fourth, fifth, and sixth cartilages. The pharyngeal mucous membrane above the ulceration appeared nearly natural, except for two or three little rounded elevations, as if there was a deposit in the mucous membrane, each less than half a pea in size. There was a small pendulous polypus attached to the thyro-epiglottidean fold. The œsophagus below the stricture was healthy.

In the mucous membrane of the trachea directly corresponding to the deep ulceration which threatened to perforate it, was a small deposit or growth—semi-transparent, solid, and slightly elevated. There was a similar one higher up, inside the cricoid cartilage, but it was more opaque and white.

The patch on the tracheal mucous surface was cut across, and from a section of it, cells having the following microscopic characters were observed: some were large, delicate, irregularly angular, with elongated processes; some were, however, rounded, and had peculiar large nuclei and nucleoli; several of these were often in one cell, and sometimes a cell-wall round one or more of the contained nuclei. Some few of the nuclei presented a delicate, regular, radial striation, which Dr. Ransom observes he had not before seen. These cells were contained amongst the meshes of the elastic tissue. From the whiter patch on the inside of the cricoid cartilage, similar cells were obtained, but they were fattily degenerated, and therefore less characteristic.

The fluids from the surface of the ulcer consisted mainly of molecular detritus and fat, in drops and granules, with a great number of epithelium scales, mostly of the scaly variety; but a few were cylindrical and ciliated, probably separated from the upper parts of the pharynx. In the little elevations on the mucous membrane of the pharynx, nothing was found but globular corpuscles and cells filled with fat granules of various

sizes, and one beautiful hexagonal crystal-like cystin was observed.

A portion of the pharynx and œsophagus, examined by Mr. Cæsar Hawkins, Mr. Pollock, and Mr. Holmes, curator of St. George's Hospital Museum, gave the following results:—

1. A portion of the disease was surrounding the great vessels in the neck, and apparently making pressure on the upper part of the pharynx. The interior appeared of a cellular character. Sections showed fibrous tissue, with numerous nuclear bodies, and much fat.

2. A small tubercle beneath one of the rings of the trachea contained an immense number of nucleated cells, resembling those of healthy epithelium, but of more curious form and size, also a good deal of fat.

3. A mass containing dark masses (of black pigment), otherwise exactly resembling the portion just mentioned.

II.

DR. MARSHALL HALL'S DISCOVERIES IN THE NERVOUS SYSTEM.

REPRINTED

WITH SLIGHT ALTERATIONS, FROM THE "LANCET" OF AUGUST 8TH, 15TH, AND 29TH, 1846, BY THE KIND PERMISSION OF THE EDITOR, BEING

A REVIEW OF A

New Memoir on the Nervous System. By MARSHALL HALL, M.D., &c. Illustrated by Five Plates. London: Baillière. 1843.

(PART I.)

IN some recent leaders in this journal we have advanced the just and meritorious cause of the author of this work against those who have opposed him. We have called his discovery the discovery of the function of the Spinal Marrow, and we have placed it high in the scale of discoveries, venturing even to award it the SECOND place in physiology. Some of our readers may think this a partial view of the question, and we there-

fore consider it right to give the reasons upon which our judgment is founded, conscious that we are right, and that all candid and unprejudiced minds must, upon due consideration of the data, arrive at the same conclusion. It is not our intention to write the eulogy of Dr. Marshall Hall or his discovery, but to give a plain account of the latter; this is its own best eulogy. Our real object is to place it fairly before the profession, according to the desire of our correspondents. For the sake of clearness in developing our exposition, we shall arrange the subject under different heads.

The Point from which the Discovery of the True Spinal Marrow started.—Harvey had been dead one hundred and fifty years, during all which time no great discovery in physiology, worthy of being placed near that of the circulation, had been made, when Charles Bell, stung to investigation by the taunts of Sir Humphry Davy and Dr. Young, that the old methods of advance were exhausted, entered upon the anatomical analysis of the nervous system. The splendid result was, that he decomposed the cerebral nerves into nerves of volition and nerves of sensation, proving that the nerves of volition were connected with the anterior portion, and the nerves of sensation with the posterior portion, of the spinal cord. It is not here necessary to trace this idea to its source, and to describe the efforts of the subsidiary workers in its elucidation. The discovery was ultimately developed so as to include all the nerves of sensation and voluntary motion. Another labour of Sir Charles Bell was, to treat of a class of involuntary nerves distinct from the sensational and voluntary, under the designation of the respiratory, including the pneumogastric, the facial, the diaphragmatic, &c. These nerves were considered by Sir Charles Bell to arise from the lateral columns, which he termed the respiratory tract of the medulla oblongata. Sir Charles Bell also added what he has called the nervous circle, by which is meant the transit of the sense of contraction from the muscles to the brain when in action, so as to regulate the amount of voluntary power to be exerted along the motor nerves distributed from the brain to the muscles.

M. Flourens, by his experiments, had already drawn, within

the cranium, the line between those portions of the nervous centres, mechanical irritation of which would or would not excite motor actions in the muscles. This separated the lobes of the cerebrum and cerebellum, with the optic thalamus and corpus striatum, from the tubercula quadrigemina and the medulla oblongata.

Previously to these investigations by Sir Charles Bell and M. Flourens, it had been demonstrated in the way of experiment by Legallois, that respiration depended on the medulla oblongata. This was an important step in physiology, and was indubitably the commencement of the discoveries which have since shed so much light on this division of the nervous system.

The discovery of the dependence of respiration upon the medulla oblongata, by Legallois; the distinction between the excitor and inexcitor portions of the intercranial mass, by M. Flourens; the description of the respiratory involuntary nerves, by Sir Charles Bell, were all the points really *known* respecting any distinction between the contents of the cranium and the spinal canal. Long before this, the elder writers, Whytt, Prochaska, and others, had spoken of obvious reflex *acts*, such as those of sneezing or coughing, and the movements of decapitated animals had very obviously been referred to the spinal marrow; but no reflex *function* had been understood, and the use of the movements observed in the decapitated animal, to the living animal, was not at all known. There were observations of *acts;* the involuntary and voluntary, pathological and physiological, being mixed together; and there were also simple experiments which led to nothing beyond the facts observed in them; but not a single induction had been made. *The Spinal Marrow had no existence in physiology.* It was always visible to the eye of the anatomist, and sometimes excited his wonder; but there was no *scientific* knowledge of the spinal marrow as a distinct organ performing special functions in the economy.

Origin of the Discovery of the True Spinal Marrow.—The sight of the vein-valves, entering the mind of Harvey, led to

the discovery of the circulation. Sir Charles Bell was led on to his discoveries by studying a sketch of the apparently confused distribution of the nerves of the neck. This origin of his labours was in keeping with the genius of Bell; his ideas of form were so correct, that it was said of him, if he had not been a great anatomist he would have been a great artist. It was the observation of the separated tail of the eft that led, in the hands of Dr. Marshall Hall, to the discovery of the true spinal marrow. The fact that the separated tail of the triton moved when the skin was irritated, taught his informed observation, at a glance, that there must be a new form of motion besides those dependent on the brain, on peristaltic action, or on muscular irritability, the only forms of motor action definitely recognised up to that time. The same *fact* had often been observed before, but had fallen sterile from the minds of its observers. It was well known that the turtle and the cock moved after decapitation; but such facts were merely considered as among the curiosities of experiment; the use and office of the form of motion thus observed had had no place in physiology. As Dr. Marshall Hall remarks, the motions were there, obvious enough to all from the very earliest times, but no one had traced these motions *backward* to that division of the nervous system upon which they depend, or *forward* to the functions to which they minister in the living œconomy.

We must refer those who wish to follow minutely the steps by which this great problem was worked out, to the various works of the author; but as a ready mode of placing the discovery clearly before the reader, we will commence with its simplest elements, and then pass to the larger view of the subject.

The Function of Exclusion.—Let us first describe a simple excito-motor *act.* The involuntary closure of the eyelids will serve very well for this. Irritation of the eyelid in health always produces instantaneous contraction of the orbicularis palpebrarum. The surface of the eyelid is supplied by the fifth nerve, the orbicularis muscle by the seventh, the nervous

centre in this act being the medulla oblongata. The irritation of the eyelid induces an action of the vis nervosa, along the fifth nerve, the excitor; then, through the medulla oblongata, the key of the motor arc; then, along the reflex motor nerve, the seventh pair, to the muscle which is to be excited to contraction. The path by which these phenomena occur is unequivocally proved by experiment. Severing the reflex motor arc at any point, whether in its incident, central, or reflex portion; by division of the fifth, injury of the medulla, or section of the seventh pair; alike prevents the ordinary closure of the eyelid. This proves the reflex nature of this act, which, simple as it is, could not be understood until the idea of an insentient incident nerve existed. That this act does not depend upon the brain, is proved by its occurrence in the anencephalic infant; that it does not depend upon volition is proved by its occurrence, in paralysis of voluntary motion in the parts supplied by the seventh pair; that it does not depend on sensation, is proved by its occurrence in anæsthesia of the face. Thus, then, we have an isolated reflex act, with the proofs of its excito-motor and its spinal nature. But let us go beyond the *act*, to the *function* which the *act* performs. The mucous membrane of the eye and eyelid is one extremity of the great system of mucous tubes, and the chief *function* of closure of the eyelid is the exclusion of extraneous matter from the eye. Here, then, we get beyond the simple *act* of closure of the eyelid—the *function of exclusion*, and this function guards all the orifices of the body—the larynx, trachea, œsophagus, &c.—against injury, or the admission of noxious agents.

The Function of Retention, and Tone.—Certain of the sphincters are found to be always in a state of contraction. At least the state of contraction is only varied by occasional relaxation during the acts of egestion. Such are the sphincter ani, the sphincter vesicæ, the cardia, valvula coli, &c. The persistence of these contractions is undoubtedly, in great part a reflex act, excited by moderate distention and irritation of the cavities with which these sphincters are connected, by their

natural contents. The dependence of this function upon the spinal marrow is proved by the loss of the function, when the spinal marrow is destroyed. In the case of the sphincter ani, the rectal nerves are the excitors, the nerves supplying the sphincter, the reflex motors, and the lower nodules of the spinal marrow, the central portion of the reflex motor arc. By grouping all the acts of this kind, and the uses they perform, together, we arrive at another spinal function—the *function of retention.*

Here a few remarks on a collateral subject may be properly introduced. There is a principle of the spinal and muscular systems called *tone.* The muscles generally, when in a state of rest, are not in a state of perfect relaxation. A certain amount of contraction is still present, sufficient to keep the flexors and extensors, and the other muscles having an opponent action, in a state of balance. This state of the muscles depends upon the spinal marrow ; when a healthy animal has been killed, it still remains, to a considerable extent ; but as soon as the spinal marrow has been destroyed, it disappears. It was at first thought that tone might depend on a constant direct influence from the spinal marrow to the muscles. Now, however, it appears probable that it depends on the general and equable irritation of the whole of the excitor nerves of the body ; acting, generally, upon the whole of the reflex motor nerves. There is thus a relation between the form of reflex action called tone and the action of the sphincters. All the other muscles of the body are prevented from any great contraction of this tonic kind, by the action of antagonistic muscles, and those sphincters, as the orbicularis oris, and the orbicularis palpebrarum, which are not firmly contracted, are furnished with opponent muscles.

The Function of Ingestion.—Let us now take another reflex *act*—that of deglutition. After the morsel of food has passed the root of the tongue and the fauces, the pharyngeal muscles and the œsophagus are excited to reflex action, and deglutition ensues. The contact of cold water, of other fluids, of a feather, when used to excite sickness, and introduced too far,

the presence of saliva, in fact, any physical stimulus brought into contact with the surface of the pharyngeal tube, excites the reflex act of swallowing. In the act of deglutition, the incident nerves are the incident fibres of the pharyngeal, œsophageal, and cardiac branches; the medulla oblongata is the centre of the reflex arc, while the motor branches of the same division of the pneumogastric are the reflex motor nerves of deglutition. The excito-motor nature of this act is as certain as in the case of closure of the eyelid. Here, then, we have another *act*, but the *function* performed is one of *ingestion*, the introduction of aliment.

The Function of Egestion.—Let us take another excito-motor *act*, that of vomiting from the presence of irritating matters in the stomach. Here the excitor nerve is the pneumogastric; the spinal centre is the medulla oblongata; the reflex motor nerves are the respiratory nerves producing a strong effort of expiration, and the motor nerves distributed to the glottis and the cardiac orifice of the stomach, producing closure of the former and dilatation of the latter. Thus, then, the reflex arc concerned in another and complex reflex act is traced. All the vastly important acts, whether morbid or functional, of which we have given examples, are precisely alike in their physiology.

The CLASS *of Spinal Functions.*—In this way Dr. Marshall Hall arrived at the conclusion, that the Reflex Function of the Spinal Marrow presides over all the acts of Exclusion and Retention, and above all, the acts of Ingestion and Egestion, in the entire animal œconomy, the great object of the reflex function being the preservation of the individual from injury, and the perpetuation of the species; the organ in these acts and functions being the Spinal Marrow and its special system of Incident and Reflex nerves. We had the words "spinal marrow" before, but there was no meaning to them, for we had no spinal function, and therefore is it that these labours may be considered as the actual discovery of the spinal marrow *as a distinct organ.* Surely this is a grand generalization; and surely, if it consisted in nothing more than

this, the discovery itself is a great induction, worthy of comparison with the highest products of the human mind in any department of science. Yet how difficult it is to get persons to look at the thing in its nobler aspects. Writers are continually referring to reflex *acts*, and to excito-motor *action*, but we know of none, except Dr. Marshall Hall himself, by whom the spinal *functions*, and the spinal marrow as a great nervous organ, are fairly treated of.

The Reflex Actions, combined with the Voluntary Motion. —But we must take another view of the subject. The reflex function of the true spinal marrow is not merely and only the presiding power in all the acts of ingestion, egestion, retention, and exclusion, but it furnishes a motor element in the voluntary motions generally. Probably with the single exception of the action of the levator palpebræ in the raising of the eyelid, there is no voluntary act whatever in which spinal motor power is not brought into play. In all the ordinary acts of voluntary motion, reflex movements are excited which are in accordance with, and aiding to, the purely voluntary act. To excite these, either some excitor surface is stimulated, as when the hand grasps any foreign body, and the surface of the foot touches the ground, or the muscular contractions themselves excite reflex spinal actions.

The reflex actions excited in voluntary movement by the contact of excitor surfaces with substances capable of exciting such surfaces are very remarkable. Take an ordinary movement of the hand; the soldier grasping his sword, or the workman wielding his hammer. There is here not merely the voluntary closure of the hand, but there is also present the reflex motor action induced by the contact of the sword or implement with the excitor nerves of the palm of the hand. Thus the soldier has the sword-hilt roughened, and the workman rubs saliva on his hand to remove the smoothness of the haft of the hammer. In both circumstances physiological laws are obeyed; there is not merely a better grasp from the closer adhesion of the hand to the object, but a firmer contraction of the muscles takes place. There is at work a voluntary

cerebral action, and also a reflex spinal action. And this is fully proved by what has been observed in a singular form of disease. In some cases of paralysis, where the brain has been diseased, but where the spinal marrow has remained intact, the patient has not been able to close the fingers by the most powerful act of volition, but the fingers would close forcibly when a rough stick was placed in the palm of the hand. Formerly this fact was looked on as a pathological enigma, and only mentioned for the purpose of exciting wonder; now, its rationale is simple enough. Another illustration may be taken from physiology. It is some little time before the new-born infant acquires command over the muscles through the medium of volition, but before an infant is able, by means of the cerebral system, to clench the hand, it is clenched readily when any excitor body is brought into contact with the palm. Again, in the case of the hare or rabbit newly killed, it has been observed, that after death, when, if left undisturbed, no movement but that dependent on chemical decomposition would ever occur, the forefoot may be made to imitate the movements of the running animal, if the plantar surface be gently brushed. These and a variety of other facts show, as plainly as may be, that in the most simple movements another power besides that of voluntary motion is in operation. This second motor power is the reflex motor action, the function of the spinal marrow and its excitor and motor nerves.

Thus, then, the spinal marrow is actively concerned in the movements of volition, and there is, perhaps, within the range of physiology, no greater indication of design than the extraordinary harmony which exists between the physical spinal motions occurring in an act of volition, and the voluntary movements themselves. In the case of the coughing excited by the presence of a foreign body in the trachea, the intention of the reflex action is obvious and perfect; but it is not less delicately and unerringly adapted to the end, than are the incalculable number of reflex actions constantly excited during the voluntary movements. And yet it is possible for an indi-

vidual to pass through a whole life without a single discordance between these two forms of motion. The harmony is so extraordinary that some observers have so far erred as to give a percipient voluntary power to the spinal marrow as well as to the brain, an idea which may however be confuted by the most irrefragable facts.

As an instance of the reflex actions excited by voluntary muscular contraction, we may give the phenomena of speech. Speech is eminently aided by spinal action. The voluntary movements all produce fatigue when long continued. The amount of exertion of which the muscles of speech are capable without fatigue, is extraordinary, when their delicate organization is considered. The part played by reflex action in natural speech is, as Dr. Marshall Hall has shown, beautifully illustrated by what takes place in certain cases of stammering. As long as the vocal organs are at rest, as regards volition, there is no spasmodic action, but the moment volition, by contracting the laryngeal muscles, supplies the stimulus to the excitor nerves, the vocal and articulary muscles are thrown into violent spasmodic action. Some cases of chorea are of the same kind, the irregular movements only appearing during efforts of volition.

It is a characteristic of the reflex motor function, that it never sleeps—never tires. In birds and fishes the ordinary movements of locomotion are as much reflex as voluntary. It is this power which enables these classes of animals to swim or fly thousands of miles without rest and without fatigue in their migrations from one ocean or one continent to another.

The Power of the Spinal Marrow a Pure Motor Power.—We must also consider excitor-motor action as a pure motor power of the nervous system, and the only one at present isolated or understood.

During amputation of a limb, as soon as the knife touches a nerve, contraction of the muscles to which it is distributed ensues. This power in the nerves is the vis nervosa of Haller. It has been the common opinion that it is the nervous fibres of voluntary motion which are irritated on such occasions;

but there are good reasons, as we shall presently see, for considering this idea unfounded. Such facts as this, respecting the irritation of nerves in amputation, remained for generations isolated and unfruitful in physiology, until Dr. Marshall Hall traced the vis nervosa backward along the motor nerve through the spinal marrow, and forward to the extremities of what had previously been considered purely sentient nerves. And in this consists his discovery—namely, that not only irritation of motor nerves, but of excitor or sentient nerves, as they were thought to be, from the time of the discoveries of Bell, will excite definite motor actions, and that Nature has so arranged the relations of the vis nervosa, the nerves and muscles, and the other material tissues of the body, that sources of excitation are continually supplied to the extremities of this system of excitor nerves, so as to keep up the regular and appropriate action of certain sets of muscles necessary to the performance of a large class of important functions. Thus, as an illustration, the organic changes going on unremittingly in the lungs, supply the carbonic acid necessary to excite the pneumogastric, the great excitor of respiration, and through this to maintain, by reflex action, the movements of inspiration and expiration. And this beautiful system of nervo-motion is different from the cerebral system in this; irritation of the brain by the finest instruments, by the most subtle chemical agents, produces no motions, though the slightest volition moves the whole body; but, on the other hand, irritation of the spinal marrow by the point of a needle, or a drop of acid, excites intense spasmodic action. Now we know, experimentally, that at all parts of the spinal nervous *arcs*, the same excitation produces the same result; suppose the excitor fibres, the spinal centre, and the reflex motor fibres, extended on into one straight line, with muscular fibres attached to the extremity, no matter which part of the length of the line is touched, the same phenomenon occurs, that is—muscular contraction. Suppose the fibres of sensation and voluntary motion and their cerebral attachments also spread out in a straight line. The only point at which we can get the cere-

bral nervous matter in a state of isolation, is in the brain, and here mechanical irritation produces no visible change in the voluntary motor nerves. Is it not probable that the same holds good with respect to the whole cerebral nervous circle? From this fact respecting the brain, is it not probable that if we could separate the volitional from the reflex motor fibres, in the same way that we can isolate the cerebral and spinal centres, we should find irritation of the purely cerebral nerves would produce no movements whatever. Throughout the body generally the spinal and cerebral nerves lie side by side in the same fasciculi; but in one instance, as we shall have again to remark, Nature appears to have given the experiment necessary for determining this point. The levator palpebræ is, it is believed, never affected by spasmodic action; irritation of this nerve, though indisputably a motor nerve, does not produce contraction of the levator muscle. These observations point to a further train of thought. The vis nervosa acting in the spinal nerves, cannot be identical with the force acting in voluntary nerves. They may be found to bear a relation to each other somewhat similar to that which exists between magnetism and electricity. This is a most interesting point in animal dynamics. The study of the animal imponderables, the *vis nervosa* of spinal nerves, the *vis mentalis* of cerebral nerves, and the *irritability* of the muscular fibre, form the very highest department of physiology.

It is the glory of our author that he should have traced in such a beautiful manner some of the laws of action of the imponderable element, acting in and through the spinal system, placing it before us for examination in its reflex, centric, and retrograde forms of action in health and in disease.

The Anatomy of the Spinal System.—Thus much, then, for the discovery of the excito-motor system. It is pre-eminently a physiological discovery. But the anatomy of the system has not been neglected by the author. He has long considered the pneumogastric as the great internal, and almost purely excitor nerve, grounding his conviction on the facts, that the parts to which it is chiefly distributed are among the

most insensible organs of the body, though this itself is one of the largest nerves; and upon the other fact of its immense excitor power, and its demonstrable relation to all the reflex nerves of respiration, deglutition, &c. He has been accustomed to look on the nerve of the levator palpebræ as offering the purest anatomy of a reflex motor nerve. But Dr. Marshall Hall has always contended that his physiological experiments have proved the existence of a special anatomy for the excito-motor system; of a class of nerves, excitor, but not sentient, and of another class of nerves, motor, but not voluntary,—the two classes of nerves being keyed by their centre, the true spinal marrow. He claims, by facts arrayed with mathematical precision, and in his own terse and incisive language, that there is the same proof of the anatomy of the excitor-motor system as there is of the anatomy of the cerebral system. This is most true. The same kind of proofs in observation, in experiment, in pathology, by which we get the obvious proof that the brain is the central organ of the psychical motions, equally maintain that the spinal marrow is the centre of the physical motions—that it is to the nervous system what the heart is to the blood. The same proofs which prove the existence of sensitive and voluntary nerves prove the reality of excitor and reflex-motor nerves. The spinal system is, in its sphere, as important as the cerebral system. And if we could imagine the spinal system to have been discovered first, we may feel sure that those who now deny the excito-motor system a special anatomy, would then have denied one to the brain. According to the spirit of such reasoners, the cerebral system owns its territory less by proved right than by prior possession. In the anatomy of the spinal marrow, there have been supplemental workers, whose claims we shall have to consider; but we now, once for all, say, that to the first discoverer the idea and the proof of this anatomy is due.

Recapitulation.—In concluding this portion of our review, we would recapitulate the chief points. The principle of action in these functions,—their anatomy, in incident and reflex-motor nerves connected by their nervous centre, their

excito-motor character, their reflex form, the CLASS of objects; the generalization, the power, the anatomy, the function, the grand purposes; with the further application (as we shall show in the succeeding portion of our review) to the diagnosis, the pathology, and the therapeutics of a great class of disease,—this is the work of Dr. Marshall Hall. We know of nothing so original, so diffusive, so developmental in its character, as the true spinal system. It seems as if it was left to our scientific labourer, guided by one scientific fact, to detail the principle, the form, the manner, the anatomy, the physiology, the pathology, and the therapeutics, of a great department in the animal œconomy.

(PART II.)

In the former part of this Review we have traced the history of the true Spinal Marrow from the point from which the discovery started, to its completion. We described it with as much clearness as we could command, as the organ which, by virtue of the nervous force, the vis nervosa, acting within it and its excitor and motor nerves, presides over all the acts of Ingestion, Egestion, Retention, and Exclusion in the living œconomy: a CLASS of functions which includes all the motor actions by which ingesta, for the preservation of the individual, and for the perpetuation of the race, are received: and all the motor actions by which egesta are removed from the system, and all the acts of retention, by which the contents of the different cavities are duly retained, as in the case of the cardia, the sphincter ani, and the sphincter vesicæ: and also the acts of exclusion, by which the orifices of the various canals and cavities are guarded, as in the case of the eyelid, which defends the eye; the larynx, which defends the lungs; and the fauces, which defends the stomach. In addition to this class of functions, we displayed the spinal marrow as a source of motor power, physical in its nature and reflex in its form, harmoniously assisting in the voluntary movements performed through the medium of the brain and the nerves of sensation and volition.

We have now to trace in outline the practical application of

this discovery to the great division of pathology and therapeutics included in the diseases and derangements of all these functions, and here, as in the case of the physiology, we have chiefly to follow the steps of one and the same individual.

Applications to the Pathology of Ingestion, Egestion, Retention, and Exclusion.—Of these, we can only, in an article like the present, allude to, or barely enumerate, the most important. Let us first take the morbid affections of the function of respiration, consisting, as it does, of acts of exclusion, ingestion, and of egestion. The first act of respiration in the new-born infant is a reflex act, excited by the impression of the external air on the trifacial, the intercostals, and the other external excitors of respiration. The last act of respiration in the dying is also reflex, excited by the pneumogastric, aided by the other excitors, and also, by volition, in cases when sensibility remains to the close. In all the series of morbid respiratory motor actions that may appear between these two periods, the spinal system is the seat of disease. The new-born infant at the moment of birth is liable to congenital asphyxia from protracted labour and other causes. Here, there is the opportunity of observing the difference between the normal respiratory acts of a reflex kind, and the gasping and convulsive attempts at respiration of a centric kind caused in congenital asphyxia by the circulation of unarterialized blood in the medulla oblongata; phenomena of the highest importance, the study of which will probably lead to new measures for the re-establishment of suspended respiration, and to greater precision and certainty in the use of the old. The croup-like convulsion, laryngismus stridulus, is another motor disorder of respiration in early life, referrible to the spinal system. It consists in spasmodic closure of the larynx, as a morbid reflex act excited by the irritation of dentition, by morbid ingesta in the stomach, bowels, and other organs; causes, all of which, if rightly understood, point to the proper measures for the relief of the malady. In croup and pertussis, also, how large a share in the pathology of these diseases is played by the spinal marrow; excited closure of the larynx in

either disease not unfrequently producing general convulsions. Again, certain forms of spasmodic asthma are nothing more than fits of morbid excito-motor action, in the more simple instances depending on the presence of some foreign body in the larynx or bronchial tubes. The effect of the powder of ipecacuanha, of, in some persons, inducing a fit of asthma, when inhaled into the lungs, is a singular instance of a substance possessing a specific excitor action upon certain excitor nerves. Its action on the lungs in producing a fit of asthma by coming in contact with the pulmonary terminations of the pneumogastric nerve, is precisely similar to the production of vomiting when the same substance is brought into contact with the terminations of the pneumogastric in the stomach. Lastly, coughing is the most familiar of all the respiratory morbid reflex actions. It is most commonly caused by irritation of the respiratory mucous membrane in some part of its course. But it may be excited, as in pleuritis, by irritation of the intercostals, and there is a cough of dyspepsia, of hernia, of disease of the uterus, of disease of the lower part of the spine, and of other organs, in which the incident nerves of the lungs are not the excitors of the act of coughing, but where the excitation is produced by the state of other and distant organs acting in a reflex form upon the motors of respiration.

The morbid states connected with the ingestion and retention of food are not so numerous as those relating to respiration, but are still sufficiently interesting. We have here, among others, the treatment of choking, in which the glottis is suddenly closed by the reflex action excited by the lodgment of the morsel of food in the œsophagus, the end in view being to produce œsophageal vomiting, by a smart blow on the thorax, or actual vomiting through the cardia by irritation of the fauces. There is also a peculiar dysphagia, in which morsels of food hang in the upper part of the pharynx, probably from some failure of the excito-motor power. Then, again, there is the rumination which sometimes occurs in dyspepsia, in which the cardia, failing in its function of retention, the food escapes through the orifice, and is returned to

the mouth by a reversed action of the œsophagus. Lastly, we have the morbid act of vomiting, which, simple as it may now be made to appear, was long an enigma in medicine. The act of vomiting, one of the purest instances of spinal action, may be excited by direct spinal action, as from mechanical irritation of the medulla oblongata, or as a reflex act. The excitors of vomiting, as a reflex act, are numerous, it being excited through the medium of the faucial branches of the trifacial; and by the pneumogastric in the stomach, the liver, the kidney, and intestines; it is also excited, in some instances, through the medium of the rectal nerves, and frequently through the influence of the uterine nerves, as in the sickness of pregnancy and parturition. The motor action employed in the production of vomiting is somewhat complex, involving not only the stomach and œsophagus, but also the respiratory portion of the spinal system in its most extended meaning.

In all these morbid acts connected with the orifices of the upper part of the body, the spinal centres concerned are seated in the medulla oblongata, the upper part of the true spinal marrow.

A similar congeries of spinal functions, with their morbid phenomena, relate to the orifices of the lower part of the body, and have their special seats in the lower portions of the spinal marrow, as may be proved by their continuance after the spinal marrow has been divided in its middle portions by injuries of the spinal column, or by limited disease.

Of these morbid actions strangury, incontinence of urine, and retention, belong to the bladder and its spinal connexions; certain forms of impotence, dependent upon hasty, or imperfect, or entire loss of action of the vesiculæ seminales and the ejaculatores, are caused by disordered states of the excitor and motor nerves engaged in the sexual function, or by disease of the spinal marrow; and many painful disorders affecting the rectum, as the intraction of the rectum bougie, the constriction of hæmorrhoidal tumours by the sphincter ani, entire failure of the power of the sphincter, and the tenesmus of dysentery, or from the action of aloes and other drastics, are referrible to

the spinal arcs which preside over the outlet of the alimentary canal.

But perhaps the most important of all the relations of the spinal marrow to abnormal motor actions is that which it bears to the disorders of parturition—in a word, to obstetrics —constituting, as it does, an entire department of the medical art. To this branch of practice, spinal physiology is the key and corner-stone. Dr. Marshall Hall has himself declared that it will one day "form the very basis" of a scientific midwifery. The range which the spinal system takes in practical midwifery is immense, including conception and certain forms of sterility; all the reflex motor disorders of pregnancy, the vomiting, cough, cramp, tenesmus, and other affections; all the varieties of abortion depending on extra-uterine irritation, as of the bladder, stomach, rectum, and vagina; all the varieties of difficult labour dependent on excessive excito-motor power, or partial or entire deficiency of spinal action; all the important accidents of midwifery, such as laceration of the perinæum, rupture of the uterus, puerperal convulsions or uterine epilepsy, hæmorrhage before, during, or subsequent to labour; all these, and a variety of other morbid states incident to abnormal parturition, have their pathology and their therapeutics made evident by a knowledge of the physiology of the spinal marrow; for it is upon this organ that all the motor actions belonging to healthy or morbid parturition essentially depend.

Thus, then, we have taken a hasty glance at the applications of spinal physiology to disordered states of the functions of ingestion, egestion, retention, and exclusion.

Applications to the Pathology of the Spinal Motor Actions which are combined with Voluntary Actions.—In the former section of the review, we spoke of the reflex motor action combined with the ordinary voluntary actions; showing that in all the ordinary acts of volition there was an excito-motor action aiding and subserving to the acts of volition. The disorders of this division of the spinal marrow form a very important and interesting portion of the pathology of the

nervous system. The obviousness of the dependence of the voluntary motions of the trunk, limbs, head, and neck, upon the brain and the nerves of volition, combined with entire ignorance respecting the existence of such an organ as the true spinal marrow, have caused medical men to consider that, in spasmodic diseases, the same motor power as that concerned in volition, is in operation, only in a morbid form. Hence, for centuries, all spasmodic diseases of the general muscular system have by common consent been referred to the brain, as the only known seat of nervo-motor power. But the new light shed upon physiology shows the entire fallacy of this. All the spasmodic actions are proved to depend upon physical irritation, while no amount of physical irritation of the cerebrum, whether of the most delicate or forcible kind, can be made to excite the most imperfect muscular motion. It is to another organ, and to another power, to the spinal marrow and its nerves, not to the brain and the nerves of volition, to the *vis nervosa*, and not to the *vis mentalis*, that we must attribute spasm. All spasmodic diseases of the voluntary muscles, as they are called, are not, then, dependent on the voluntary motor system or upon the voluntary motor power, but on the spinal system and the excito-motor power.

There are, of this kind, spasmodic affections of a local, and others, and more important, of a general nature. Among the local disorders may be ranked some of the varieties of stammering, strabismus, spasmodic tic affecting the face, and spasmodic torticollis. Among the more general motor disorders, the chief are chorea, which in some cases affects almost all the voluntary muscles; epilepsy; the convulsions of children; puerperal convulsions; tetanus; and hydrophobia: constituting some of the most fearful diseases to which the œconomy is ever liable. It would be impossible to enter here on the special pathology of these diseases; suffice it to say, that they are undoubtedly spinal in their nature, and that the discovery of the physiology of the spinal marrow, and its application to their pathology, lay their nature more clearly open to the comprehension of the physician, than, it need not be said, are

the nature of any other diseases of equal importance, but of any diseases at all. We can now better understand tetanus than we can typhus fever. One or two important points may be stated. Tetanus and epilepsy are both attended by general spasmodic action, but in the one there is spasm of the glottis and insensibility; in the other, there is sensibility, and the glottis remains open. Dr. Marshall Hall places these phenomena together in the relation of cause and effect. Another distinction, and one of the most beautiful to be found in pathology, is contained in the memoir placed at the head of the present article—namely, the pathological distinction between tetanus and hydrophobia. The distinction lies in the causes of the two diseases. Tetanus is caused by disease of the spinal marrow, or by irritation of a wounded nerve; hydrophobia is caused by a poison-wound, the poison being specific, and introduced into the blood. In one the blood is poisoned, and the intra-vascular poison is conveyed to the spinal centre; in the other, it is nerve-irritation, exciting the spinal marrow until the motor influence is radiated with terrific force through the reflex motor nerves to the general muscular system, and at length the patient is killed, in the one case by spasm of the larynx, in the other by spasm of the muscles of respiration generally. We repeat it, this distinction between the affection of blood, and nerve, in hydrophobia and tetanus, is one of the most subtle distinctions yet made in pathology.

Another branch of pathology implicating the general muscular system, to which the physiology of the true spinal marrow offers a satisfactory solution, are those affections to the relief of which orthopœdic surgery has, in recent times, been applied. All these contractions, some of which depend upon injury done to excitor surfaces of the limbs themselves, others to reflex motor contractions from irritation of excitor nerves in distant parts; others from the withdrawal of voluntary motion by paralysis, and the consequent surrender of a limb, or certain muscles, to the contracting influence of tone; all these affections require careful study by the light derived from the division of physiology we are considering. When

this has been done, the necessary operations will be performed on a scientific basis, and we confidently believe some at least of the operations will be spared.

Centric and Eccentric Diseases of the True Spinal System.—We have thought it convenient to separate the pathology of the acts of ingestion, &c., from the pathology of the reflex actions, mixed up with, and formerly disguised by, the voluntary motion. Dr. Marshall Hall has himself adopted another division of the subject, which equally applies to our own arrangement. He divides all the diseases of the spinal system into those of centric and those of eccentric or centripetal origin; the sources of disease, in the one case, being centric irritation of the true spinal marrow itself; in the other, eccentric irritation, or irritation of incident excitor nerves at some portion of their course. Thus, we remarked that tetanus might either depend upon irritation of an incident nerve from a wound, or upon irritation of the spinal centre. Epilepsy may depend upon gastric or uterine irritation, or upon pressure on the medulla oblongata. This idea of the centric or centripetal origin is applicable to all cases of disease occurring in the spinal system, according as the cause of the disease arises in the incident, or the centric and reflex motor portions of the spinal arcs.

Spinal Paralysis, and the Diagnosis of Paralysis of Cerebral Origin.—In the different forms of paralysis, the discoveries in spinal physiology are of vast importance to the initiated observer, as a means of diagnosis. It is indeed scarcely too much to say, that the knowledge of the reflex function is as much a key to the diagnosis of paralytic affections as the stethoscope is to the disorders of the heart and lungs. We have said that *all* spasmodic diseases *must* be seated in the spinal system, but paralytic diseases may be either cerebral or spinal, and there is a clear unmistakeable difference between the two. We were speaking, be it understood, of paralysis of motion only. The diagnosis of paralytic affections, simple as it may be now, could hardly have been perceived until the discovery of the true spinal marrow. The following

circumstances mask the diagnosis, and make it appear, at first sight, as though only one motor power, that of volition, was suspended. In simple hemiplegia, for instance, in which the brain is injured, but without pressure, or other injury, to the medulla oblongata, there is loss of voluntary motion in certain limbs which hang useless and motionless. Yet the spinal motor power still exists in the paralysed limbs, only it is not developed, because the power is purely physical, and is excited by the contraction of the muscles in volition, or by the volition placing excitor surfaces, as the palm of the hand or the sole of the foot, in contact with bodies capable of exciting appropriate reflex actions. That the motor power is there, is proved by the fact, that actual convulsion may affect the paralysed limbs. They may be contracted in convulsive action when the brain has been so far disorganized that they cannot, and never would, move again from volition. Again, in less ultra cases than these, when, if no excitation were applied, the limbs would remain perfectly quiet, we often see, that when the fæces or urine have accumulated so as to excite reflex actions of the rectum and bladder, reflex movements are excited in the limbs, which were not even excited in health, or were masked by volition. Or let the palm of the hand be irritated, or the skin of any excitor surface pinched, or let the sole of the foot be irritated, and reflex motions occur. All these things occur in uncomplicated cerebral paralysis; but in spinal paralysis from division or limited disease of the spinal marrow in its middle portions, below the origin of the phrenic, the spinal motor power still remains in the lower limbs, and the parts of the body in relation with uninjured portions of the spinal marrow. But here an important remark is required. In these cases, the reflex acts, the natural excitors of which remain, are performed the same as before; thus the bladder voids its contents, the rectum is emptied, and the fœtus expelled from the uterus, perfectly, as far as the actions of the bladder, rectum, and uterus are concerned. But in the case of the limbs, the natural excitors supplied by acts of volition are gone, and though reflex actions may be excited in the limbs with tole-

rable regularity, they are not precisely the same as those of health. Such actions are not physiological, but in the nature of experiment; they may be interfered with, too, by various causes, such as long-continued paralysis, and impaired nutrition of the muscles, or, in recent cases, by the influence of shock. Yet, in ordinary practice, and even in hospitals, if a case of paraplegia from disease or injury to the spinal marrow in the middle portion occur, and if the expected reflex actions are not manifested in the limbs by any stimulus the attendant chooses to apply, he forthwith rubs his eyes and puzzles his intellect in doubt. He looks for physiological actions where the physiological sources of action are gone. The natural reflex action of the bladder and rectum, where the physiological excitors remain, go for nothing. So, also, in cases of general cerebral palsy suddenly induced, often before the shock has been recovered from, the spinal system is teased for spasmodic actions in the limbs, and if they are not manifested, the case is set down as one in which there were no reflex actions, though respiration, deglutition, and, in fact, all the spinal functions are performed perfectly, excepting only those excited in the natural state by volition.

Spinal paralysis may depend upon causes seated in the excitor nerve, as in the case of paralysis from the irritation of teething; or upon injury of the spinal marrow, as in myelitis; or upon lesion of the reflex motor nerves, as in paralysis of the face from pressure on the fifth after its exit from the cranium. In all such cases—indeed, in all cases of paralysis—the seat of injury is to be ascertained by observing the manifestations of the *vis mentalis* and the *vis nervosa*. The minutiæ upon which a diagnosis should depend cannot be treated within the scope of a review—the whole subject must be studied; but what we have said will direct inquirers into the right path.

Condition of the Muscular Irritability in Paralytic Limbs.—Another source of diagnosis lies in the state of the irritability of the muscular fibre in paralysed limbs. Dr. Marshall Hall early stated, that where the paralysis was *cerebral*, the muscular irritability as tested by galvanism was

greater than in the natural state; but that when it was *spinal*, the irritability was greatly diminished. This was at first disputed, but recent experiments have confirmed it. A small number of plates must be used so as not to disturb the patient, and excite wincing, when, if the case be properly chosen, and is of a cerebral nature, the paralysed muscles will contract more forcibly than the muscles which are still under the influence of volition. This test is very readily applied in hemiplegia where the paralysed and sound limbs may be tested by the same amount of galvanic influence.

Relations of Emotion to the Spinal System.—The physiological and pathological influence of emotion have an important relation to the physiology and pathology of the spinal marrow. We can only here say, that the emotions, having probably their seat higher up than the boundary drawn by M. Flourens between the excitor and inexcitor contents of the cranium, yet influence the muscular system, for the purposes of emotional expression, entirely through the spinal marrow and its motor nerves. Many of the true spinal actions and functions may be induced through the influence of emotion; thus, the sensation of nausea may induce vomiting, &c. In an analogous way, many of the diseases of the spinal system are induced by emotion, as in the case of epilepsy from fear, puerperal convulsion from mental shock, and so forth. But these phenomena cannot be called reflex, "reflex actions of the brain," without a confusion of terms; for all the purely reflex actions are *physical*, excited by physical stimulus applied to excitor nerves; but in the case of spinal actions, morbid or physiological, induced through the influence of emotion, there are *psychical* phenomena in the emotion itself which draw a distinct line of demarcation between the nature of the emotional and the simply reflex actions, in health and disease.

Therapeutics of the Spinal System.—This is a subject as yet in its infancy; but as the knowledge of the spinal marrow is destined to revolutionize to a great extent physiology and pathology, so also will it inevitably alter our ideas of the action of remedies. The first subject naturally attended to after the

discovery of incident insentient nerves, was the effects of the removal of morbid ingesta, or retained matters, from excitor surfaces, as a means of preventing or curing disease. This, from the scientific knowledge of the subject being substituted for the empirical observation which formerly obtained, gives the practitioner at once a great power over all spasmodic diseases of local origin.

It will, in the nature of things, be many years before all its applications are satisfactorily made out. This must be the case from the very magnitude of the subject. But even from the outline we have here drawn, we may fairly appeal to the profession, whether there has ever before been made a discovery in physiology greater than that we have been considering in its practical applications to the advancement of our science.

In the next, and concluding portion of our review, we shall enter upon some general considerations relating to the progress and rank of the discovery of the true spinal marrow.

(PART III.)

Reasons for the Tardy Reception of the Discovery.—There have been peculiar reasons why the spread of this discovery has lagged so singularly. In the first instance, the conduct of the Royal Society was a buffet of no ordinary kind. A discovery which claimed to be great, and which would condescend to no lower designation, was placed under a bitter ban, when the Royal Society, the proper home of "natural knowledge," drove it forth as unworthy a place in its *Transactions*. The powerful bias thus created against it, prevented the fair play of the medical mind, and the matter was obliged to wait till it could be set right by that resilience which belongs to truth, and which is always developed by anything like injustice. Then, again, the notes of derogation proceeding from the Royal Society were taken up and re-echoed by several among the medical journals. Another cause for the slow reception of the reflex function has lain in the material studies of medical

men. The tendency of the present medical era has been towards a new form of humoralism ; the studies of the times —morbid anatomy, pathology, and organic chemistry—are all material in their objects, and render men's minds inept to the study of the phenomena and the laws of action of a vital force or imponderable, such as the excito-motor power. Other reasons are, that very many have taken their views of this department of physiology from polluted sources: it is not unfrequent to see persons writing upon the matter, and dogmatizing upon its merits, who evidence by their productions, and candidly confess, that they draw their knowledge from the writings of partial reviewers rather than from the works of Dr. Marshall Hall himself. Another reason for its slow growth lies in the logical and inductive nature of the thing itself. To understand and master the matter as far as it is at present known, requires close and earnest thought; the study of nervous action may be called the purest branch of physiology, and, like the higher mathematics or optics, it requires an effort even from the prepared intellect. How many are there who clearly comprehend the discoveries of Bell? and the spinal marrow and its functions are very much more complex than the voluntary nervous circle, the cerebral nerves of sensation and motion, or the arrangement of the respiratory nerves. Other causes might be enumerated, but these seem, to our view, to have been the most obvious hindrances to the sharp and clear comprehension of this department of physiology.

But it may be said by some, that Dr. Marshall Hall has met with nothing of which he can justly complain, that the opposition has only been proportioned to the extent of his innovation on long-received opinions. Our opinion is, that his case stands alone in the modern history of real and legitimate discovery; for the virulence of his enemies, their consummate meanness in paring down the matter to the smallest possible degree when forced to admit its truth, and for their vain, but intense labour to give a little here and a little there, a hint to this observer and a fact to that, away from the true and lawful source, so as, if possible, to make it the labour of the age in-

stead of the man, or, at all events, as one of our correspondents remarks, to pass it quietly on into the next generation, without greeting or reward in this. Sir Charles Bell's discovery met a better fate; he had his plagiarists, but the truth soon swept them away; he had to complain, not of blackballing, but that his papers appeared one after the other in the *Philosophical Transactions* without exciting attention; but his time came, and suddenly, as he says, after reading a paper no better than the rest, a cumulative reputation, worthy of all his labours, burst upon him, and he stood confessed the head of anatomy and physiology at that time. Knighthood followed—a knighthood rendered more illustrious by the scientific names in whose company he received the honour, those of Herschel, Ivory, and Brewster.

It has always been the fashion in late times to magnify the impediments thrown in the way of Harvey, and to exaggerate the discouragements he received from his contemporaries, on first broaching his immortal discovery. For this, a little reflection will point out various reasons. For instance, pseudo-discoveries, systems, and sciences are continually coming up to the ordeal of truth, and passing back to oblivion, and their cry, in their origin, and at their death, is always to magnify the persecutions great men and great truths have generally met with. Besides, for a present age to condemn the judgment of an age that has passed away, is somewhat in the nature of a compliment to its own judgment. We do not here mean to say that Harvey had not to battle with his full share of that opposition which awaits all new and diffusive truths. Such opponency is almost inevitable, perhaps necessary; some philosophic writers have maintained that the opposition which confronts a new discovery is, from its tendency to winnow the chaff from the grain, one of the proper elements of its establishment. That Harvey's practice was injured by his discovery there can be little doubt, still less that he was derided by many of the learned of his time. As regards practice, Sir Charles Bell had the same story to tell; he has left it on record, that after every step in his discovery he was obliged

to work harder than ever, to preserve his reputation as a practitioner. We have heard Dr. Marshall Hall say, that if he had been devoted to physiology before establishing himself in practice, he should never have succeeded at all. But look at another phase of the comparison between Harvey and the physiologist of our own day. Twenty-five years after the discovery of the circulation, its reception was universal, the name of Harvey was revered wherever science was known, and as the greatest honour they could bestow, his "loving colleagues," as he calls them in the preface to his Exercitations, the Fellows of the College of Physicians, laid the Presidency of the College at his feet. In the case of Dr. Marshall Hall a very different state of things obtains; it was ten years from the time of his discovery before he was even elected to the Fellowship; and perhaps it is not too much to say, that at the present time there is not within the College another Fellow who thoroughly comprehends the advance which has been made in the physiology of the nervous system. Certainly this might be proved to be correct of every one who has committed himself to print upon the subject. It tells very much for the envy and jealousy of immediate contemporaries, that in no country in which medicine is cultivated, France, Germany, Italy, America, are the labours of Dr. Marshall Hall so little appreciated as in his own. Yet, in his case, more than half the quarter of a century for which Harvey waited has passed away since the detection of the true spinal marrow. In the great diffusion of scientific knowledge, our societies for the cultivation of science, our teeming press, and the constant communication between men of science in distant countries, it might have been expected that the new steps of knowledge would have had a fleeter progress than of old.

Estimate of the Discovery.—In estimating the importance of the discovery of the true spinal marrow, we have but two legitimate subjects of comparison in the history of physiological science—namely, the discoveries of Harvey and of Bell. The discovery of Harvey, embracing the whole microcosm, probably stands alone, considering the era at which it was made, and

the extent of this great advance in physiology. It was a discovery in animal mechanics, and the first great induction that had ever been made in science. The discoveries of Sir C. Bell and Dr. M. Hall, on the other hand, are in their nature dynamical. Sir Charles Bell's was the first step in the decomposition of the nervous system into its elements; for the separation by Bichat of the ganglionic nerves from the cerebro-spinal, as they were, and are still, erroneously called, was a mere classification based on morphology, rather than on experimental decomposition. Sir Charles Bell's discovery may be characterized as the decomposition of the cerebral nerves into nerves of volition and nerves of sensation. It explains the channels of sensation and volition, and is of great use in the diagnosis of some forms of paralysis. But its rare merit is, that it was the first great step in neurology. The discovery of the true spinal marrow by Dr. M. Hall is grander than that of Sir C. Bell, inasmuch as it is a decomposition of what was considered the great cerebro-spinal centre itself, into two parts, the cerebral and the spinal. By analysis, these two elements of the nervous system were separated, and the spinal marrow made the subject of observation and experiment; by synthesis, the different parts of the spinal system were recomposed; the anatomy; the nervous force concerned, and acting within this anatomy; the laws of action of the nervous force; the functions it is intended to perform in the œconomy, were all harmoniously arranged, so as to form the excito-motor system, or the anatomy and physiology of the spinal marrow; and it is not too much to say, that these sciences offer no other such perfect example of analysis and synthesis.

If we compare the difficulties of making the three great discoveries, we doubt whether the palm must not be given to Dr. M. Hall. The *preludes*, as they are termed, of all great advances in physical science are more or less obscure or intelligible. In the case of the circulation of the blood, the valves were known, and the flux and reflux of the blood between the heart and lungs—the pulmonary division of the circulation—had, in fact, been described. From these imper-

fect data, Harvey made such a sure and gigantic step that he left scarcely anything to be added to the doctrine of the circulation. In the case of Sir Charles Bell, the *prelude* was, perhaps, more clear and precise; the idea of separate nerves of sensation and volition issuing from the spinal canal had undoubtedly been put into currency by Mr. Alexander Walker; only in his hypothesis sensory nerves were mistaken for voluntary nerves, and *vice versâ*. From this idea,—and we do not, in writing thus, imply that Bell worked after Mr. Walker's idea,—but, speaking historically, from this, the true theory of the nerves of sensation and volition was developed and proved. And we think Sir C. Bell completed a sufficient amount of scientific proof of this discovery for himself. There has been a great disposition to consider that the only irrefragable proof has been supplied by Professor Müller. With the profoundest respect for the vast attainments of this physiologist, we demur to this, and consider that Sir Charles Bell's dissections of, and experiments on, the motor and sensitive nerves of the head and neck, but especially his observations on cases of paralysis, had already supplied the proof; that of Professor Müller, however valuable, being only complementary. In the case of Dr. M. Hall, the *prelude* to his discovery were the experiments of Haller, Whytt, Redi, and Blane, and the speculative ideas of Prochaska. The experiments of these anatomists we have already termed unfruitful; they led to nothing in the way of physiological induction or physiological principle. The speculations of Prochaska, though extremely ingenious, were entirely wanting in scientific precision; physiological, experimental, and pathological phenomena, actions dependent on the will, actions which we now know to be spinal, and ganglionic actions—were all mixed together heterogeneously; but in none did the leading idea of Dr. Marshall Hall—that of the existence of incident spinal nerves—exist. The term *reflex* was, it is true, used by some, but it was in the same sense as the word is now used in morals or politics, as something secondary or dependent, but not in its full scientific meaning as used in optics, or at the present time in physiology, and im-

plying *incidence*. Of the contemporary names, who, by their own egotism, or the vanity and partiality of their friends, have been placed in competition with our author, it is scarcely necessary to say a word. For any actual competition there never was any chance—Dr. Marshall Hall has always been too lynx-eyed, and too far in advance of his contemporaries, for this.

When the subject was still less understood than at present, there was a disposition to cede some of the merit of the discovery to Sir C. Bell. In an able article in the *Quarterly Review*, the nervous circle of Bell was treated as the germ of the discovery of excito-motor action. The truth is, nothing in the nature of nervous action can be further apart than the two things; the one depends upon sensation, the other is independent of sensibility; the one is voluntary and psychical, the other is involuntary and physical. Where Sir Charles Bell approached the subject most nearly was, in his arrangement of the respiratory nerves separately from nerves of ordinary voluntary action. In this part of his labours he saw the motor portions of what we now know as the reflex arcs of respiration, but these nerves did not appear to Sir C. Bell in the light of reflex motor nerves, as we now understand them, because reflexion implies incidence; and the idea of a reflex motor arc, composed of incident, centric, and reflex motor portions, had never entered the mind of man. Sir Charles Bell saw the spinal motor nerves of respiration, and referred them to a supposed tract in the medulla oblongata. Legallois, as we have seen, proved the dependence of respiration upon the medulla oblongata, but the two portions were physiologically unintelligible, and of little use, without the third and most important fact, the existence of incident nerves, which gives light and meaning to the other two. It was upon respiration that this portion of the researches of Bell was limited; and as regards this single function, the ideas of Sir Charles Bell bear about as much comparison to those of Dr. Marshall Hall, as an isolated pillar bears to a perfect arch, or rather, indeed, to a series of arches, combined so as to form a magnificent edifice.

The mutual obligations of Sir Charles Bell and Dr. Marshall Hall deserve to be succinctly stated. The motor portions of the respiratory system had been observed by Sir Charles Bell, but without any knowledge of the incident nerves in connexion with them. On the other hand, the discovery of incident excitor nerves explained the apparent anomaly of the motions excited by division of the posterior nerves in Sir Charles Bell's experiments.

In estimating the extent of the originality of any discovery, great care and conscientiousness is required, particularly when comparing it with the ideas upon the same subjects by which it has been preceded. To appreciate the real worth of the doctrines of Whytt and Prochaska, we must take them as they would exist in the mind of a person who was familiar with them alone, and not as they may *seem* to be to the mind of a person already informed in the doctrine of the true spinal marrow. It must never be forgotten, that when any actual advance in the path of discovery has been made, we look upon old ideas with a new flood of light thrown upon them. We do not see them as they were in themselves, and as they appeared to those who were conversant with them when they existed alone; and we are very apt to consider the illumination thrown upon them by the new light, as their own natural brightness.

The Discovery dynamical in its Nature.—We have already insisted upon the circumstance, that both Sir Charles Bell's discovery and that of Dr. Marshall Hall are discoveries in animal dynamics—the only ones as yet accomplished—the highest form of discovery of which we have any conception. The perfectness with which it came from the author's mind is no mean element for consideration in computing its scientific rank. On this ground the true spinal marrow takes a high standing. In the "Idea of a new Anatomy of the Brain," there were many errors mixed up with great genius and originality. Sir Charles Bell, it must be stated, almost stopped at its first induction. Division of the anterior nerves destroyed motion, of the posterior, sensation. The induction is obvious,

and Sir Charles Bell applied this induction a step further, and in a beautiful manner, in his proof of the existence of a nervous circle, combining volition and sensation, a point, the importance and subtlety of which has never been adequately noticed; but Sir Charles Bell never inquired what power it was in the nerves by which this circle was completed; whether, in fact, mind—the *vis mentalis*—be present throughout the cerebral system, from the extremities of sensory to the extremities of voluntary nerves, or whether the mind be confined to the brain, and some other *vis* be not the agent in the nerves of volition and sensation. But the discovery of the true spinal marrow resembles that of the circulation, in the completeness with which it came from the mind of its discoverer. Succeeding ages have left all that Harvey did untouched and uncorrected; only one new point has been added in the better knowledge of the capillaries, the *vasa intermedia*, as they have been termed by Dr. Hall, to whom we owe this addition. Amidst all the scrutiny to which Dr. Marshall Hall has been exposed, he has only been moved from his original positions on one or two limited points, such as in the question of whether the optic nerve contains incident spinal nerves or not, and whether the action of the œsophagus is reflex or peristaltic, or both. The discovery, then, under consideration, is doubly extraordinary, in its dynamical nature, and in its perfectness. It is as though Galvani, or Volta, or any other of the subtle Italian minds, should not only have discovered a new imponderable, but should have traced it in its various relations.

Conclusion.—We have already dwelt on the extensive range of the applications of the spinal system to the theory and practice of medicine in their widest signification, and we have mentioned some of the departments it is destined to revolutionize in its progress. The discovery itself has taken many years to make its way even in physiology; and its complete application to diagnosis, pathology, and therapeutics, and the other branches of medical science, to which it will ultimately extend, will probably be the work of a still longer time.

In all that relates to the knowledge of the nature and treatment of nervous diseases, there can be no doubt whatever that Dr. Marshall Hall is far in advance of his contemporaries. He has been left to labour almost alone in the magnificent track he has had the genius and good fortune to bring within our comprehension. Yet this matter, as all great discoveries must in their nature be, is *patent*, in the good and noble sense of that word, to the whole world.

Still, though as yet so imperfectly accounted of, it is a point gained—a step in science, a new fundamental idea for all future cultivators of natural knowledge—a new formulary to work with, and lead on to the conquest of other difficulties. The author's writings, the Euclid of the nervous system, as we have elsewhere called them, will be worked out, problem after problem, until the knowledge of the nervous system and its diseases is rendered certain and scientific in place of the uncertainty and chaos which inevitably obtained before. That this will, as it ought to do, build up a great fame for the man who has given medicine this important acquisition, there can be no doubt: but it will also have another value to medicine and to medical men. It will be the first great application of physiology to practice, the new basis upon which our art must hereafter rest, and which will be the final means of delivering it from the hands of the ignorant and empirical; for when it has once been shown that a knowledge of the physiology of the nervous system is the great key to the comprehension of its diseases, the same modes of investigation will be applied in other departments; the physiology of the circulation and its developments, in the chemical physiology of the blood, and the subsidiary animal fluids, will be pushed on to their fruits, which Harvey indistinctly foresaw, but which as yet have never been realized into positive knowledge to any great extent. In how many points of view, then, are these modern discoveries in neurology important?

There is not a man in the profession now who understands the subject, or who will in times to come, but owes, or will owe, a debt of gratitude to Dr. M. Hall. The well-educated

physician or surgeon stands at the side of the sick, not in his own strength alone, but in the strength of the great names who have done most to furnish him with weapons against disease—he stands in the strength of the ancient sages, and of Harvey, Jenner, Laennec, Hunter, Bell, and the rest of the glorious band of discoverers who have ennobled our profession. And now the name and labours of Marshall Hall, second, as we said at the commencement of these articles, and we repeat at the close, only to the immortal Harvey, will be added to the roll; his name, in spite of envy and "detractions rude," another honour to the medical escutcheon—another word of power in the republic of science; and his labours another and victorious weapon in the armoury of medicine. For such individual minds, the world must wait in successive generations for the further steps which shall carry our science and our art onward. Every step once made can be repeated by the feeblest mind; mysteries that have kept the human mind for ages in suspense, their key having been found, are mastered by the diligent student in a few hours; and thus knowledge is prepared for other advances towards truth.

> as the sea
> Waits ages in its bed, till some one wave,
> Of all the multitudinous mass, extends
> The empire of the whole; some feet, perhaps,
> Over the slip of sand which should confine
> Its fellows so long time. Henceforth, the rest,
> Even to the meanest, hurry in at once,
> And so much is clear gained.

III.

DURING the eleven years of Marshall Hall's life, subsequent to the appearance of the foregoing, the additional applications of his discoveries to practice, and particularly to the whole class of convulsive diseases, were numerous and important. These are chiefly to be found in his "Synopsis of the Dia-

staltic Nervous System," published by Messrs. Longman and Co. In 1848, in his essays on convulsive diseases, he first made the suggestion of tracheotomy in certain laryngismal forms of epilepsy, and some other convulsive affections. The whole subject is discussed in his "Synopsis" of 1852, pp. 14-38; in the *Comptes Rendus* of October 18th, 1852; and in his "Aperçu du Système Spinal," p. 229, &c. Having communicated this suggestion to M. Louis, the latter wrote to him the following remarkable words:—

"Courage, donc, mon cher ami, continuez à interroger l'expérience avec la sagacité que vous apportez en toute chose; et si vous êtes dans le vrai, vous ne serez pas plus heureux que moi de votre invention—grande et magnifique invention! —qu'on pourrait placer à côté du problème résolu par M. Leverrier."

No long period elapsed before the adoption of his plan by several practitioners with perfect success; and in a short time twelve cases occurred in which the results were most satisfactory. A thirteenth is recorded at p. 367 of this volume.

The following remarks on this subject are made by Dr. Marshall Hall ("Aperçu," p. 229):—

"Je n'ai pas du tout proposé de faire l'opération de la trachéotomie pour *guérir* l'épilepsie. Mais il arrive *deux* cas, dans le cours de cette maladie effroyable, dans lesquels je crois que la trachéotomie peut être d'un grand secours: le premier est celui où le malade est jeune encore, et où la maladie n'est pas encore invétérée; il y a alors dans les accès un laryngisme spasmodique, ou constriction du larynx bien prononcée, avec efforts violents *d'expiration*, gonflement du cou, de la figure, des yeux, et congestion encéphalique comme *effets;* la mémoire et l'intelligence commencent à être menacées. Qui ne s'aperçoit pas que la trachéotomie peut, dans ce cas, apporter un secours des plus précieux, et qu'elle peut sauver l'intelligence et donner le temps pour le traitement? Cela est, en effet, arrivé.

"Le deuxième cas est celui où, après des accès très forts et très répétés, le malade tombe dans un état d'apoplexie simple ou de congestion cérébrale, avec stertor, asphyxie (laryngisme paralytique), et danger pour la vie. La trachéotomie prévient cette asphyxie, d'abord toute laryngienne, et a sauvé la vie à plusieurs malades. Seulement il faut avertir que si l'opération est faite trop tard, le malade, secouru d'un premier danger (l'asphyxie laryngienne), peut succomber à un second, c'est-à-dire à une asphyxie bronchiale. Ces deux événements sont aussi arrivés. Ces formes d'asphyxie dépendent de la paralysie du nerf pneumogastrique : c'est l'asphyxie laryngienne lorsque le rameau récurrent est paralysé ; c'est l'asphyxie bronchiale lorsque, après que le malade est secouru du premier danger par la trachéotomie, ce sont les rameaux bronchiaux qui restent paralysés, d'où des accumulations de mucus dans les bronches, asphyxie bronchiale et mort.

"Telles sont les deux circonstances dans lesquelles la trachéotomie peut, je crois, être d'un grand secours pour conserver l'intelligence et sauver la vie. Je n'ai pas besoin de dire que dans les cas invétérés, organiques d'origine ou dans leur progrès, ce n'est que dans les circonstances toutes particulières qu'on peut songer à la trachéotomie. Il faut qu'il y ait de l'espoir. Il faut aussi que le diagnostic du laryngisme et de ses effets soit bien établi. Il faut, enfin, que l'ouverture de la trachée-artère soit bien ample, bien maintenue ; ce qui est bien loin d'être toujours arrivé."

The cases are then quoted, and the following remarks added :—" Il serait difficile, je crois, de rencontrer des cas plus encourageants pour une nouvelle méthode de traiter des maladies aussi graves. Les accès ont été changés, de haut mal qu'ils étaient, en petit mal ; l'intelligence, déjà affaiblie, a été réstituée ; la vie a été sauvée. Je me permets seulement de dire : 1° Que la trachéotomie a notablement diminué la force des attaques ; a converti, pour ainsi dire, le haut mal en petit mal ; 2° Qu'elle a *arrêté* le cours de la *perte de l'intelligence*, et a même *ramené* le malade *de la démence* à l'intelligence ; 3° Qu'elle s'est interposée pour *empêcher la mort*."

IV.

ON THE

MARSHALL HALL METHOD

IN

DROWNING AND OTHER FORMS OF APNŒA OR SUSPENDED RESPIRATION.

By CHARLES HUNTER,*
Late House-Surgeon to St. George's Hospital.

THE Marshall Hall Method or Treatment for Drowning is daily spreading over the globe, and ever adding, in its onward course, fresh lives to those it has already saved, joy to those to whom the lives are dear, and fresh honour to the memory of Marshall Hall.

The development of this method is a memorable event in the annals of physiology, for from the time when it was originated *rational science* may be said to have made its most important start in the treatment of the *drowned:* reason then stepped in where routine and error had always held the sway. The conflict in the minds of the profession generally was short indeed; and although the *old*, the universal, and the routine plan of treatment was previously engrafted in the minds of all, yet no sooner did the sound physiology and the efficacy of the *new* method become apparent than the old system was generally rejected; the veil of error was

* Mr. Charles Hunter, of Wilton Place, Belgrave Square, whilst studying at St. George's Hospital, was one of three gentlemen who, as expressed in the dedication to them of the last work of Marshall Hall, "with such zeal, ability, and perseverance worked out the problem of postural respiration;" the other two gentlemen being Dr. E. L. Fox and Mr. R. L. Bowles. Mr. G. Webster, of Peckham, had previously assisted in another department of the investigation.

Dr. Marshall Hall himself performed many experiments, and amongst others, some relative to the inhalation of the various gases, ably assisted by Mr. Lloyd Bullock, of Hanover Street. In detailing these in his work on "Prone and Postural Respiration," he adds, "Dr. J. W. Ogle and Mr. Bullock have kindly repeated them, and have arrived at the same conclusions."—C. HALL.

removed, and true physiology and sober judgment now guide the minds of thinking and unprejudiced men.

Within the last few years no greater practical benefit has been conferred on mankind than this ready method of Marshall Hall, to whom all the greater honour is due because the treatment as now employed was worked out—not guessed at by chance—by a careful consideration of the physiological processes of Nature herself; and still more are respect and honour due to Marshall Hall, because the investigations, which lasted some months, were carried out by him when he was suffering great bodily exhaustion consequent upon disease of long standing, and whilst he even knew that death was not far off. But these circumstances did not deter the English physiologist, as long as he had power to think, or strength to write, from perfecting as much as possible his scheme for the welfare of future generations; in fact, seeing that he had but a short time left him still to carry out his favourite maxim, that "England expects every one to do his duty," he appeared each day, as his own life drew towards a close, the more anxious on this question of vitality for others.

Various are the designations by which this new process is known. Many at once proposed to call it by the name of its author. Dr. Marshall Hall himself sometimes described it as the "Ready Method," as indicative of its independence of all apparatus or special appliances; and sometimes as the "Postural," or the "Prone and Postural" method. The latter two names more or less express the nature of the plan. The term now generally adopted by the Profession is "The Ready Method of Marshall Hall:" its simple, ready, and *unencumbered* beauty will be seen as we proceed.

Although Marshall Hall had for years given great attention to the subject of Respiration, chiefly with regard to reflex action and to certain physiological phenomena, it was not till about the year 1855 that he more particularly investigated the *treatment of the drowned*. His attention was then drawn to the subject by one of the Annual Reports of the Royal Humane Society. He there found that all the instructions of the Society were directed to the application of *heat*,

and that the main point the treatment seemed to aim at was to restore the *heat* of the cold and breathless body.

Marshall Hall then questioned whether heat *was* the great thing to be desired; he reasoned that drowning occasioned asphyxia from carbonic acid gas, and that clearly the first thing we ought to do was to give the system an opportunity of throwing off the poison (carbonic acid gas), and the lungs the opportunity of breathing pure air—in other words, to replace at once the impure by pure *air*.

Common sense suggests that where death is impending from cessation of lung-action, and the consequences of that cessation upon the system, death can only be averted by restoring lung-action.

One would think that this very simple view of the matter had always been the rule of faith for the treatment of the drowned; but no, incredible as it may appear, the rules of the Royal Humane Society which Marshall Hall had been perusing in 1855, set aside all mention of restoring the respiration both in their "cautions concerning" and their "restorative means for persons drowned."

The vital theory of Marshall Hall is this:—A person submerged is deprived of *air;* without air he cannot live, for he cannot respire; give him air to breathe, and he will, if he has still the *power* to breathe, yet live; and, in the second place, if he has not the power, give him the power; perform respiratory acts for him, and he will yet live.

Such is the Theory of the ready method, and the Practice acts thoroughly up to the theory.

For impending death from want of breath, give breath and avoid death—is the gist of Marshall Hall's argument.

For impending death from want of breath, the Royal Humane Society used to do *nothing to the point;* they found the body cold and insensible, and therefore considered warmth the all-important remedy.

But *why* is the body cold and insensible? It is because

Nor does the Society even *now* practise any other than the heating process.—April, 1861.

ceased, and so has the purification of the blood by oxygen, and so has the elimination of impure air from the lungs—for the most vital process, the respiration, has been arrested, and in consequence of that, the coldness and insensibility, which are *secondary effects*, occur. Those, therefore, who recommend warmth as the main treatment for the cold and insensible body are only treating the effects of a cause, whilst they let the cause itself remain; they are striving to cleanse the muddy river below, instead of preventing the further access of the contaminating agent higher up.

But the postural method strikes at once at the root of the evil, and whilst removing the cause of the symptoms, it obviates further ill—it effects respiration; and in doing so, it slowly, surely, and physiologically abates and removes the insensibility and the other consequences of the temporary suspension of respiration (apnœa). We have thus seen what the process is to effect, and the reason why it does effect it. Let us, then, read the rules themselves, as they occur in Marshall Hall's work on "Prone and Postural Respiration," p. 100.

Rules for Prone and Postural Respiration.

Rules to be Applied in Every Case.

1. Treat the patient instantly, on the spot, in the open air, exposing the face and chest to the breeze (except in severe weather).

I. *To Clear the Throat.*

2. Place the patient gently on the face, with one wrist under the forehead.

[All fluids and the tongue itself then fall forwards, leaving the entrance into the windpipe *free*.]

If there be breathing—wait and watch; if not, or if it fail—

II. *To Excite Respiration.*

3. Turn the patient well and *instantly* on his side, and—

4. Excite the nostrils with snuff, the throat with a feather, &c., and dash cold water on the face previously rubbed warm.

If there be no success, lose not a moment, but instantly—

III. *To Imitate Respiration.*

5. Replace the patient on his face, raising and supporting the chest and abdomen well on a folded coat or other article of dress.

6. Turn the body very gently on the side and a little beyond, and then briskly on the face, alternately; repeating these measures deliberately, efficiently, and perseveringly fifteen times in the minute, occasionally varying the side.

[When the patient reposes on the chest, this cavity is compressed by the weight of the body, and expiration takes place; when he is turned on the side, this pressure is removed, and inspiration occurs.]

7. When the *prone* position is resumed, make equable but efficient *pressure*, with brisk movement, along the back of the *chest*; removing it immediately before rotation on the side.

[The first measure augments the expiration, the second commences inspiration.]

THE RESULT IS—RESPIRATION; AND, IF NOT TOO LATE, LIFE!

IV. *To Induce Circulation and Warmth.*

8. Rub the limbs *upwards*, with firm grasping pressure and with energy, using handkerchiefs, &c.

[By this measure the blood is propelled along the veins towards the heart.]

9. Let the limbs be thus dried and warmed, and then clothed, the bystanders supplying coats, &c.

10. *Avoid the continuous warm bath and the position on, or inclined to the back.*

In regard to the above rules of Marshall Hall, it may be asked—Why treat the patient in the open air, exposing the face, &c.? Why is this better than the warm room, or the warm bath? It is so for two distinct reasons,—first, we thus obviate the danger of delay; and in the next place the cold air or breeze is an undoubted excitant of respiration. Who does not inspire freely as he passes into the cold fresh

air from a hot and close room? And does not every one know that the cold bath excites rapid breathing more than the warm?

The second rule tells us how to clear the throat; that our patient may breathe—we are to place him on the face, the forehead being supported or rested on the wrist.

Adoption of this position may alone save the life of the patient, for the following important points are gained by this simple movement:—

1. The chest is compressed and expiration effected;
2. Fluids in the mouth, the nose, and the top of the throat, flow away;
3. The glottis or upper extremity of the windpipe is opened; for the tongue falls forward by its own weight.

It has been objected that the Marshall Hall method begins with expiration instead of inspiration; but by the three reasons just given, in favour of beginning the process with pronation, the objection is more than answered: for if you start with *in*spiration, you may draw fluid into the lungs; whilst, on the other hand, if you start by producing *ex*piration, you open the glottis, clear the air-passages of fluid, and get rid of some of the poisonous air before the pure air is inhaled—three great points gained by a single movement.

Having thus enabled air to enter the lungs under the most favourable circumstances, we can turn the body on the side, and observe whether any sign of life exists, any breathing or gasping; if it appears that feeble breathing *does* exist, or has recommenced, we may proceed to excite it till the breathing is freely restored (by Rule II.); but if *no* sign of breathing be manifested, then we at once proceed mechanically to *imitate* the acts of respiration (Rule III.).

The reader will recollect that it is a "ready method" we are describing—a method ever ready, useful at all times, and not dependent for its success on cumbrous or huge machinery, or blowing apparatus, appliances which are always being invented, but never at hand when wanted, and perhaps out of repair when found. No, the ready method requires nothing

save the observing eye and the active hands of the bystander, who would thus proceed to employ the method. He would free the neck and chest and let the cool air blow upon them; then quickly rub the face with his hand, and as quickly dash it with cold water; a start, or gasp, if any life remained, might follow; an inspiration, deeply-drawn, might even then occur, and, if it did, the excitation might then be followed up by friction of the face and hands and arms, by dashing of cold water on the just warmed face, by snuff, perhaps, or the tickling with a feather of the back part of the throat.

But should the nervous system be too far deadened for excitation to avail, then, as laid down in Rule III. §§ 5, 6, 7, the bystander would, without the delay even of a minute, perform artificial respiration; he would pronate, make pressure on the spine, semi-rotate, and then again pronate, and continue these movements till respiration had become spontaneous and life was safe.

The pronation is the most important part of the process, for the three reasons just given: to the physiologist its value cannot fail to be apparent; for others it may be well here to state that one great result gained by the pronation is that the tongue falls forward from the top of the breathing tube, whilst in the supine position it does not drop away, but in many cases helps to kill the patient (in the paralytic apnœa from chloroform, for instance), because it prevents air from entering the lungs.

The prone and postural method must be carried out with care, with forethought, not hurriedly, but quietly and steadily, the mouth being kept clear of the ground by placing the wrist beneath the forehead. We must recollect that to hurry the process is only to half do the thing; that to half do the thing is to furnish the patient with only half the air he would otherwise have, and ought to have.

Having established good respiratory action, we can more particularly look to the skin and the bloodvessels; and, by the means indicated in the rules, complete the recovery of the patient.

We have thus far looked on the Marshall Hall method as the treatment *par excellence* for Drowning; and had it no other use than that, it would be deserving of the wide celebrity it is now receiving; but this plan, like most other practical suggestions, has rapidly received a far more extensive application than was originally anticipated; Marshall Hall himself proposed it in convulsion, epilepsy, recovery of the still-born, and some other cases (see pp. 36, 91, 93, 94, &c., of his work on "Prone and Postural Respiration").

The various kinds of cases, in which this treatment has now been instrumental in restoring life, may be arranged into *three* classes:—

I. Those of impending death from accidental causes;
II. Those of impending death from the effects of disease;
III. The cases of still-born children.

In the first class of cases the object of the treatment is to save life; in the second, to prolong life, or restore it, if possible; in the third, to give life.

I. *Among the Accidental Causes, Drowning must rank as the Chief.*—Many glorious instances have been recorded where life must have been sacrificed but for the timely adoption of the Marshall Hall method.

The cases of Dr. Alexander of Dundonald, of Dr. Hadden of Skibbereen, of Dr. Legat of South Shields, and those of other gentlemen, published at various times in the *Lancet*, and recorded in the work on Drowning (Part II.), are well worthy of perusal, and are full of interest to the inquiring mind. They show how other methods, previously tried, failed to produce any effect, how a good result was at once obtained by the *Ready* Method, and how, in the bad cases, if the postural measures were for a time discontinued, the untoward symptoms would again supervene, and only be completely removed by further use of the *Ready Method.* The case by Dr. Alexander admirably illustrated this last point.

Mr. James West has related a case of suffocation from being buried alive, a well-marked instance of the value of the method

in cases where the patient is dying from the effects of impure blood, and yet has no power to breathe, and so to purify it.

Then again, in the apnœa from narcotic poisoning, this method is invaluable. A most admirable instance of perseverance, in an apparently hopeless case of poisoning from opium, is recorded by Mr. Blades of Tattershall, who for *several hours* kept up respiration by the Marshall Hall method, until, in fact, the effects of the poison had passed off.

The value of the method in this class of cases is especially great, for most narcotics kill by stopping the respiration; if, therefore, the respiration can be kept up till the effect of the poison has passed off, the patient, as in Mr. Blades' case, may be saved. Life often appears in danger during the administration of chloroform for surgical operations. Now if there be any treatment that will restore the vital functions in this alarming condition, it is the Marshall Hall method, whether the danger threaten from the heart or from the lungs; for, if from the lungs, we have every reason to look for success, but if from the heart, I know of no *more* effectual plan of restimulating that organ than by establishing, and that instantly, free respiration; and respiration, in *this* kind of case, where the danger is due to a narcotic in the system, can only be freely and thoroughly effected by the Marshall Hall pronation and rotation, because of the paralysis of the tongue by the narcotic vapour.*

Cases of recovery from danger by chloroform have been recorded by Mr. Curran and myself. In these, the Ready Method succeeded after other plans had failed.

II. *The Second Class of Cases are those of threatening Death by Apnœa from Causes dependent upon Disease.*

Marshall Hall himself suggested the employment of the ready method in the spasmodic exacerbations of chronic laryngitis, of convulsion, epilepsy, and choking. No cases that I am aware of were published during his lifetime, in which the method had been used in the above-mentioned

* It is true the tongue may be pulled forwards by a pair of forceps, the instrument may *not be at hand*, and such a process is clumsy unphilosophical.

diseases; nor has it been so much resorted to in the department of disease as in that of accident. But still many lives have already been saved where death would have won the victory, had not the Marshall Hall method, humanly speaking, turned the scale. Thus, in certain spasmodic affections of the respiratory passages, or obstructions of the same by fluids or solids, the results of disease, the breathing may fail, and without assistance, cease altogether. Mr. White, of Warwick Street, tells me that he more than once saved the life of his child, during croup, by the Marshall Hall method.

In a case of rapid effusion into the breathing tubes, when both pulse and respiration seemed gone for ever, prone respiration and the ready method, after long persistence, *saved* the man.

In diseased conditions, such as I am speaking of, the *prone* position for respiration is of itself highly important, as in the case just mentioned. It is, alone, as valuable in disease, as the Marshall Hall method in full is for accidental cases, such as drowning.

Thus, in cases of apoplexy and of serious injury to the head, death is always to be feared from the effect upon the lungs. Prone respiration has in these cases greatly improved the symptoms and prolonged life. The prone position may also be used to nullify that inharmonious sound called *stertor*, which is made by people in deep sleep and on other occasions, as elaborately detailed and classified by Mr. Bowles; the death rattle may also be prevented by it.

III. *To Animate Still-born Children.*—Whatever may be the number of lives added to the population by the Marshall Hall method, in the two classes just described, they fall very short of that of the infants apparently dead that have been brought to life by the long and persevering efforts of a vast number of the professional men of England.

Great indeed must have been the satisfaction to Marshall Hall as day by day he read in the *Lancet*, or in letters addressed to himself, the numerous cases in which, through his instrumentality under Providence, infants were saved which would

otherwise never have lived at all. No mere speculations or vague assertions, of perhaps scientific but unpractical men, can NOW shake the faith of the large body of medical practitioners, in town and country, who have witnessed many, many practical exhibitions of the great value of the method both to restore and to start life in apparently the most hopeless cases, and after lengths of time hardly credible; nor do I doubt that ere long the Marshall Hall method will be with all practitioners and nurses familiar in their mouths as household words.

Where, I may ask, will the practical value of this method end? Time alone will develop. It is to me only as the other day that I was one of those assisting in the first experiments, made at the suggestion of him who now has left us. Yet since that day *five* years have passed away, and we who live can see the working of his great idea at home, abroad, among the highest and the lowest, starting the youngest into life, prolonging the vitality of the oldest, and saving all humanity between those ages from accidental dangers.

Who, of late years, has left mankind a legacy so universal, a boon so widely spread? Not a diminishing or daily wasting gift, but one growing every day, enriching new inheritants. *Magna est veritas—veritas prevalebit;* and so shall prevail the true and physiological method of Marshall Hall.

The recent experiments of Dr. Waters, of Liverpool, as well as my own, lately recorded in the *Lancet*, confirm the truth of Dr. Marshall Hall's views. In fact, the evidence in favour of these is daily accumulating.

With great truth has it been said by R. Ellis, Esq., of Newcastle-upon-Tyne, that "the name of Marshall Hall will be remembered, and his labours appreciated by unborn generations. In the meantime the profession in *our own day* will not readily abandon a mode of treatment which is every day yielding such happy results. If Dr. Marshall Hall had devoted his great intellect to means for the *destruction* instead of the *preservation of life*, doubtless he would have been publicly honoured and rewarded."

In every quarter of the globe grateful parents are acknowledging the life-restoring boon they have received, by bestowing upon their children the honoured name of Marshall Hall as that of a great benefactor, not only to their own families, but to the whole human race.

In conclusion, I would say, the original name "Ready Method" was adopted by Marshall Hall at my suggestion; but I entirely coincide with the sentiment of the Editor of the *Lancet* in the quotation with which I close this notice:—"Anything more simple, philosophical, or beautiful, could not have been devised. It is proposed to call the plan the *Ready Method* of treating the drowned. Infinitely preferable, in our opinion, would be the title of the Marshall Hall method. This designation is due to the discoverer; and the method would thus be benevolently associated with his name to the end of time."

LIST OF THE WORKS

OF

MARSHALL HALL, M.D.*

1812.—Thesis, on Irregular or Slow Fever.

1815.—1. Case of Painful Subcutaneous Tubercle. 2. Case of the Effects of Tobacco.—*Ed. Med. and Surg. Jour.*

1816.—Contributions to Diagnosis (four Papers).—*Ed. Med. and Surg. Jour.*

1817.—The Diagnosis of Diseases. 8vo. Longman and Co.
Contributions to Diagnosis.—*Ed. Med. and Surg. Journ.*

1818.—On the Mimoses. 8vo. Longman and Co.
1. Description of an Aërometer for Pneumatic Experiments. 2. On the Achromacy of the Human Eye. 3. A Mode of preserving Vegetable Remedies. 4. Spontaneous Combustion of Cotton imbued with Linseed Oil.—*Jour. Roy. Institution.*

1819.—On a Peculiar Species of Gangrenous Ulcer, which affects the Face in Children.—*Ed. Med. and Surg. Jour.*
Case of Chronic Inflammation of the Larynx, in which Laryngotomy and Mercury were successfully employed.—*Med. Chir. Trans.*
1. On the Oxidation of Iron. 2. On a Mode of producing Intense Cold.—*Jour. Roy. Institution.*

1820.—The Effects of Irritation and Exhaustion after Parturition, Abortion, &c. 8vo. Longman and Co.
1. On the Mimoses. 2. On Scorbutus, &c.—*Ed. Med. and Surg. Jour.*

1821.—Four Cases of Children who had attempted to drink Boiling Water from the Spout of a Kettle.—*Med. Chir. Trans.*

1822.—On the Symptoms and History of Diseases. 8vo. Longman and Co.

1824.—Medical Essays. 8vo. Longman and Co.
On the Effects of Loss of Blood.—*Med. Chir. Trans.*

Notwithstanding every endeavour to render this list accurate, it is probable that some among the numerous writings of my husband may have escaped me.—C. H.

1825.—Destructive Inflammation of the Eye in the Puerperal State. —*Med. Chir. Trans.*

1. On the Physiology of Speech. 2. On the Movements of the Barometer.—*Jour. Roy. Institution.*

1826.—Commentaries on the Diseases of Females. Plates. 8vo. Seeley and Co.

1828.—1. On the Due Administration of Bloodletting. 2. On a Hydrencephaloid Affection of Children, arising from Exhaustion. (Read at Med.-Chir. Soc.)

On the Rationale of Vomiting.—*Jour. Roy. Institution.*

1829.—1. On the Use of the Ergot of Rye. 2. On Puerperal Mania. —*Lancet* and *Med. Gaz.*

Case of Perforation of the Stomach and Œsophagus.—*Ed. Med. and Surg. Jour.*

1830.—Observations on Bloodletting, founded on Researches on the Morbid and Curative Effects of Loss of Blood. 8vo. Seeley and Co.

Commentaries on Diseases of Females. 2nd ed. Sherwood and Co.

1831.—On the Anatomy and Physiology of the Minute and Capillary Vessels. (Read at Roy. Soc.)

An Experimental Essay on the Circulation of the Blood. 8vo. Seeley and Co.

Eupœdia, or Letters to a Mother on the Watchful Care of her Infant. 12mo. Sherwood and Co.

1. New Operation for Nævus. 2. New Operation for Prolapsus Uteri, Cases, &c. 3. Mania from Exhaustion.—*Med. Gaz.*

1832.—1. On the Inverse Ratio between Respiration and Irritability in the Animal Kingdom. 2. On Hibernation.—*Phil. Trans.*

Experimental Investigation of the Effects of Loss of Blood. —*Med. Chir. Trans.*

On a Particular Function of the Nervous System.—*Proc. of Zool. Soc.* (This was the germ of the Diastaltic Nervous System.)

On the Nature of Inflammation.—*Med. and Phys. Jour.*

1833.—On the Reflex Function of the Medulla Oblongata and Medulla Spinalis.—*Phil. Trans.*

1. On Œsophageal Vomiting. 2. On Tetanus.—*Med. Gaz.*

1836.—Lectures on the Nervous System and its Diseases. 8vo. Sherwood and Co.

On the Observation of Diseases of the Nervous System.

1837.—Principles of the Theory and Practice of Medicine. 8vo. Sherwood and Co.

1837.—On the Functions of the Medulla Oblongata and Medulla Spinalis, and on the Excito-motory System of Nerves. (Read at Roy. Soc., and afterwards published with the Memoir of 1833.) Illustrated by Plates. 4to. Sherwood and Co.
Lect. on Pract. of Med.—*Lancet.*
On Spasmodic Tic.—*Brit. Annals of Med.*

1838.—1. Lect. on Pract. of Med. 2. Lect. on Nerv. Sys.—*Lancet.*

1839.—Principles of Pathology in the Nervous System.—*Med. Chir. Trans.*
1. Phagedæna Oris. 2. Acute Anasarca.—*Lancet.*

1840.—Three Papers on Nerv. Sys.—*Med. Chir. Trans.*
On Irritability.—*Cyclop. Anat. and Phys.*
Cerebral Disease, &c.—*Lancet.*
Oration.—*Brit. Med. Assoc.*
Papers on Excito-motory System of Nerves.—*Müller's Archiv.*

1841.—Diseases and Derangements of the Nervous System. 8vo. Baillière.
Letter to Sir R. Peel on Medical Reform.
1. On the Difficulties in the Study of the Nervous System. 2. On the Use of Setons, especially in Paraplegia.—*Lond. and Ed. Monthly Jour. Med. Sci.*

1842.—Gulstonian Lectures. 8vo. Baillière.
1. Cause of Contractions of Uterus. 2. Apoplexy and Hemiplegia. 3. Respiration of Birds. 4. Stridulous Convulsions in Infants. 5. Neuritic Sciatica.—*Lancet.*

1843.—New Memoir on Nervous System. Illustrated by Plates. 4to. Baillière.
On the Circulation in the Acardiac Fœtus.—*Lond. and Ed. Monthly Jour. Med. Sci.*

1844.—1. On the Treatment of Lateral Curvature of the Spine. 2. On a Means of Diagnosis in Cases of Ovarial Disease. 3. On Aphoria or Sterility. 4. Diagnosis in Paralysis of the Face. 5. Use of the Alcoholic Lotion in Phthisis. 6. Motive for Scarification of the Gums in Dentition. 7. On a Warm and Moist Atmosphere in the Sick Room.—*Lancet.*
1. On the Mechanism of Vomiting. 2. On the Irritability of the Muscular Fibre in Paralytic Limbs.—*Lond. and Ed. Monthly Jour. Med. Sci.*

1845.—Practical Observations and Suggestions in Medicine. 12mo. Churchill.
On the Influence of the Mind on the Body.—*Ann. Orat. Lond. Med. Soc.*

1846.—Practical Observations and Suggestions in Medicine. 2nd Series. 12mo. Churchill.

1846.—Three Papers on Nerv. Sys.—*Lancet.*
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