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THE BEGINNINGS OF THE NATIONAL HOSPITAL, QUEEN SQUARE (1859-1860)*

BY

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As a background to the story of the opening of the National Hospital in 1860, the state of medicine, as it existed in London during the first half of the nineteenth century, may be briefly surveyed with special attention to neurology. In many ways it was a dull if not an arid period. It has been called "the age of medical degradation," as marking the lowest ebb in medicine for centuries. Physicians had largely neglected the nervous system, its structure, function, and pathology. True, a century and a half before, Willis had made many promising observations; but these were clues which others had failed to pursue, and many indeed were forgotten.

At about the mid-point of the nineteenth century the up-and-coming fashionable doctors were Sir William Jenner (b. 1815) and Sir William Gull (b. 1816). The heyday of Sir Samuel Wilks came a little later. None of these men, however, can be said to have greatly advanced the knowledge of organic nervous disease. The Guy's galaxy of talent proved a little more fruitful. Richard Bright (b. 1789) had interested himself in apoplexy, and his writings upon this topic were full of substance even though the attainment was patchy. From Dublin one nervous disorder at least had been explored through the brilliance of Robert Graves (b. 1796).

Foundations of London Neurology

In London the principal exponent of the lush, but obscure, symptomatology of nervous disease was Robert Bentley Todd (b. 1809), physician to King's College Hospital. Todd must be looked upon as one of the first precursor-neurologists, for he enriched our knowledge with his observations upon lead palsy, and especially upon post-epileptic hemiplegia, which we still speak of as Todd's paralysis. To him is due the credit for the earliest description of tabes dorsalis, made four years before Romberg, eight years before Russell Reynolds, and 11 years before Duchenne, who is usually, but wrongly, accorded priority. Todd's untimely and unnecessary death from cirrhosis of the liver at the age of 50 was a considerable loss to medicine, and to neurology in particular. It could almost be said of him that, like the Persian philosopher, he had been in the habit of deliberating each problem twice over, first drunk and then sober; or perhaps it was the other way round. Had Todd survived another year or two he would surely have been invited to join the staff of the

National Hospital. As it was, his pupil Julius Althaus founded in 1866 the London Infirmary for Epilepsy and Paralysis, afterwards known as the Maida Vale Hospital for Nervous Disorders.

The formative stage of neurology was also facilitated by work of an experimental character, carried out, as it so often was in those days, by part-time practitioners rather than by academic professionals. In this connexion Charles Bell (b. 1774) was pre-eminent. From his makeshift laboratories in Leicester Square and in Soho Square, and from the Hunters' old school of anatomy in Windmill Street, Bell gathered material for his *Essays on the Anatomy of Expression* (1806) and for his studies on the nature and function of the spinal roots (1810). Work upon the anatomy of the facial nerve and of the long thoracic nerve led to the publication of his book *The Nervous System of the Human Body* (1830). This was more than a simple anatomical atlas, for it contained illustrated accounts of morbid affections, later to be described more fully, such as Thomsen's disease and pseudo-hypertrophic muscular dystrophy. His final monograph was upon *The Hand* (1830), which he was commissioned to write by the Royal Society, supported by the Bridgewater Legacy.

Another great scientific figure of that time was the Nottingham physician, Marshall Hall (b. 1790). Moving to London at the age of 36, he became a tireless writer and researcher, though never lucky enough to attain the honour of a hospital appointment. His principal work was *The Reflex Function of the Medulla Oblongata and Medulla Spinalis* (1833). Although reflex action had already been envisaged by Descartes, by Boyle, and by Hales, it was Marshall Hall who really established this phenomenon as a cardinal property of the nervous system. Only tardily were his ideas accepted by his colleagues, put off perhaps by traits in his character or manner which were unattractive. Bentley Todd and Professor Carpenter opposed him: the Royal Society turned a deaf ear and refused to publish his writings. Abroad, he was acclaimed. In the City of York Thomas Laycock had, for one, realized the importance of Marshall Hall's work, and in due course he doubtless indoctrinated his pupils, Hughlings Jackson and David Ferrier.

Such, then, were the slender foundations of London neurology as it existed in 1860. Contributions from the Continent seeped in, it is true, but in a slow trickle. In Berlin, Romberg was 65 at the time of the birth of the National Hospital. Türck was 50, and Robert

*Based on an address given to the Osler Club on March 15, 1960.

Remak 45. Among French contributors, Magendie had died five years previously; Flourens was 66 and Claude Bernard 47, Cruveilhier had retired, being 69 years of age, while Baillarger was 51, Duchenne 54, Charcot 35, and Vulpian 34. Bouillaud, the Dean, was pontificating in Paris at the age of 64.

London at this time was therefore witnessing the false dawn of neurological science. Neurologists in the true sense of the word did not exist, and there were no neurological departments in any of the teaching hospitals. Epileptics and victims of paralysis lay in their own plight at home, if indeed they were not condemned to the semi-neglect of Poor Law hospitals and asylums for the insane.

Romberg's Work

Nor was neurological teaching the showpiece it was later to become. Even the literature of nervous disorder was sparse. Charles Bell had gone so far as to state that it would be a long time before combined efforts would enable a medical author to arrange and accurately describe the diseases of the nervous system. However, in 1840, M. H. Romberg endeavoured to do so. After asserting, in more sanguine vein, that "in no department of pathology had physiology exerted so great an influence, and that nowhere had free research achieved so glorious a victory over dull, traditional routine, as in the doctrine of nervous disease," he proceeded to issue the first part of his manual upon that subject. Dedicated to von Humboldt, the work was issued in serial form between 1840 and 1846. It was not until 1853, however, that E. H. Sieveking translated it into English.

Even when judged by contemporary standards, much of this bulky work of Romberg's makes disappointing reading. He deserves great credit, however, for the way in which he based his study of disease upon the lessons of physiology. In view of the present-day cult of brain-chemistry it is interesting to find him issuing a warning against the tendency which was even at that time prevalent in Germany and elsewhere—"to seek for all explanations of diseased action exclusively either in the chemical changes occurring in the fluids and solids during life, or in the manifestations of morbid change as presented in the dead house."

Though this work is often referred to as the first textbook of neurology, this statement is not quite accurate, for a few other specialized writings were also available prior to 1840. James Parkinson's *Essay on the Shaking Palsy* was written in 1817, but it stands, of course, in a class all of its own as being a monograph. Special mention should be made of John Cooke's *Treatise in Nervous Diseases*, which was published in two volumes, in 1820 and 1823, respectively, but which is now almost forgotten. In discussing what had been written upon neurological topics we must not forget the second volume of Bright's *Reports of Medical Cases* (1831); nor yet Benjamin Travers's *Constitutional Irritation and the Pathology of the Nervous System* (1835). Of a very special character was Robert Carswell's *Illustrations of the Elementary Forms of Disease* (1838), wherein we discover the first depiction of the pathology of disseminated sclerosis, made while the author was still a medical student in Glasgow. All these works antedated Romberg. His manual was shortly followed by Marshall Hall's dissertation *On the Diseases and Derangements of the Nervous System* (1841). A little later—but still in the pre-Queen Square era—appeared the popular treatise by A. L. Foville (1844); the *Traité Pratique des Maladies Nerveuses* by C. M. S. Sandras (1851); and Bentley Todd's *Clinical Lectures*, the second volume of which was largely devoted to nervous disorders (1857).

It was in such a climate of sciolism, coupled with lack of facilities for the care of the neurological sick and disabled, that our story opens.

Founders of the Hospital

In the Borough of St. Pancras, as it is now called, lived in modest circumstances a close-knit family comprising two sisters, Louisa and Johanna Chandler, and their brother Edward. A much-loved grandparent who had been responsible for their upbringing went into the country. She returned home paralysed, and remained so until her death. This serious illness drew attention to the utter lack of hospital provision and the inadequacy of specialist and nursing attention for such cases. The Chandlers were determined to correct these shortcomings, and from talks with their family doctor

The National Hospital in 1866.

The National Hospital in 1960.

they concluded that a special hospital was needed where victims of paralysis and also of epilepsy might receive humane and skilled investigation, management, and treatment. Undaunted by their slender resources, the Chandlers set out to interest their friends and to collect funds. The two sisters sold little trinket-boxes which they constructed from beads and cowrie shells, and by the end of two years they had collected the sum of £200. Of greater importance, they had also secured the sympathetic ear of the reigning Lord Mayor, Alderman David Wire, who himself had recently been afflicted with a hemiparesis.

Events now moved rapidly. A small working party formed itself, and a public meeting at the Mansion House was called for November 2, 1859. Here it was resolved to set up a special institution to be called the "Hospital for the Paralysed and Epileptic." A committee of management was formed, with the Lord Mayor as Chairman and Edward Chandler as Secretary. Suitable premises were sought, and early in 1860 an empty house was found and rented at No. 24, Queen Square. Its locality was suitable, and its size permitted an outdoor clinic, as well as accommodation for 10 in-patients.

A century ago Queen Square was steadily changing its character. Bloomsbury and Holborn had for many years been a favoured site for the town mansions of some of the nobility, which were set in open pastureland and marshes. Lamb's Conduit Fields was famed not only as a pleasure for city dwellers but also as a duelling-ground. At the end of the Stuart era the bracing air attracted wealthy invalids to settle here, and we find the ailing Duke of Gloucester, son of Queen Anne, building a house at what is now the southern aspect of Queen Square. To the north there was an attractive and uninterrupted view of Ken Woods and Highgate, and immediately in front was a streamlet which, taking origin in the spring at the Devil's Conduit, supplied with water the Christ's College in Newgate Street before joining the Fleet River. Retired East Indian merchants began to build near by in contemporary Old Gloucester Street and Boswell Street. In 1706 Sir Streynsham Martin, former Governor of Madras, was instrumental in founding the Church of St. George the Martyr close by. Gradually, from 1716 onwards, residences were built along the south, west, and east aspects of what was originally called Devonshire Square. It was afterwards renamed in honour of the reigning Queen Anne. The northern vistas were retained.

Queen Square became a fashionable locality popular with senior members of the Bench. Among the distinguished residents one may enumerate Dr. Campbell (friend of Dr. Johnson and Mrs. Thrale), Dr. Burney, Edmond Hoyle, Jonathan Richardson, Lord Chief Justice Denman, Mr. Sergeant Hanbury, Lord Chancellor Bathurst, Lord Chief Justice Pollock, and Elihu Yale.

During the mid-nineteenth century the Square became less modish but perhaps more interesting. The houses in Guilford Street had now cut off the view of the hills of Hampstead and Highgate. An expensive girls' school now appeared in the Square, and also the annexe to the Great Ormond Street College for Working Men. William Morris set up his workshop, office, and residence at No. 26. Miss Louisa Twining, the

philanthropist, moved into what had been Dr. Campbell's residence at No. 20. St. Katherine's Convent was established at Nos. 32 and 33. The corner house, No. 1, became a tavern which took over the original title, "The Queen's Larder," Florence Nightingale instituted her St. John's Nursing Service in the Square, between the eventual Examination Hall on one side and the Alexandra Hip Hospital on the other. There was a time, too, when Queen Square showed signs of becoming a sort of Quartier Latin. Three taverns stood close by, patronized regularly by William Morris. The Square also contained, at one time or another, an antiquarian bookshop, Burr's Private Hotel, the town-house of a Gaiety girl, a spiritualist society, two doctors' surgeries, and even for a while a night-club. We recall, too, that in the eighteenth century two watchmen patrolled the Square by night to frighten away small boys and prowling harpies.

The National Hospital was the first of the various medical institutions which were later to find accommodation in the Square itself, though the Hospital for Sick Children had been founded a year or two before in Dr. Richard Mead's house close by in Great Ormond Street.

John Zachariah Laurence

The early fortunes of the National Hospital were considerably influenced by the support of four most unusual men. In the first place there was Dr. John Zachariah Laurence, born around 1829 in London. After graduating at University College Hospital he became a surgeon to the Farringdon Dispensary. Gradually his interests turned from surgery to ophthalmology, and in 1857 he helped to set up the South London Ophthalmic Hospital, now known as the Royal Eye Hospital. Two years later we find him joining the preliminary conferences instigated by the Chandler family, and, when at the Mansion House it was agreed to institute a special hospital for the paralysed and epileptic, Laurence became a member of the committee of management. In 1860, however, it was decided that a visiting surgeon should be elected to the National Hospital, and Laurence, desirous of this

Dr. Charles Edouard Brown-Séquard.

appointment, resigned from the lay committee so as not to embarrass the selection board. Laurence was successful, but he did not hold the position longer than a year or two. His professional interests were becoming more and more optical. He edited the ophthalmic review, and he also became eye surgeon to St. Bartholomew's Hospital in Rochester. To-day Laurence's name is perpetuated in the so-called Laurence-Moon-Biedl syndrome. Laurence lived and practised at 30, Devonshire Street, and died in 1870. Of the Jewish Faith, Laurence was a man of great gifts and versatility, a philanthropist, and a pioneer of new ideas. He was also a fine linguist, and was deeply interested in the Arts.

Jabez Spence Ramskill

The second medical influence stemmed from Dr. Jabez Spence Ramskill, who was born in 1824 and educated at Guy's Hospital. He became a physician to the Metropolitan Free Hospital, and it is probable that about this time he became acquainted with the Chandler family. Almost certainly it was because of this friendship that Ramskill was made the first physician to the National Hospital, even before any actual accommodation had been secured. In the same year Ramskill was also elected assistant physician to the London Hospital, practising from St. Helen's Place, off Bishopsgate. Ramskill never became a top-ranking neurologist, though the students at the London are said to have greatly appreciated his lectures on the nervous system. He contributed articles to Reynold's Encyclopaedia of Medicine. Ramskill is said to have been deeply interested in the drug treatment of epilepsy, and when he died in 1897 he had unfortunately not completed an elaborate inquiry he had started into the problem 35

years before. It is strange that Ramskill was never elected a Fellow of the Royal College of Physicians, but he received the rarer tribute of being posthumously declared "a very genial and kindhearted man . . . greatly missed by his colleagues, and by his many friends outside the profession."

Charles Edouard Brown-Séquard

The third medical personage who assisted at the birth of the National Hospital was a man of very different type—namely, the unpredictable Dr. Charles Edouard Brown-Séquard. Details of his strange career are well known. Born in 1817 in Mauritius of French-American parentage, Brown-Séquard carried out his medical studies in Paris. At an early age he showed interest in the physiology of the nervous system, and worked in the laboratories of Dr. Martin-Magron. While an extern on Dr. Trousseau's service he prosecuted researches, often using himself as a sort of experimental animal. When the coup d'état broke in December 1851, he deemed it expedient to leave France, and he settled for a while in Philadelphia. Here he did some of his best original work, including his well-known study of the effects of hemisection of the spinal cord. Incidentally, the familiar Brown-Séquard syndrome had already been demonstrated in 1700 by Ramazzini.

Brown-Séquard could never settle in contentment anywhere outside his beloved Paris, and, leaving Philadelphia, he married an American lady and then roughed it for a while in New York. Hopefully returning to Paris, he found no job available, and so proceeded to Mauritius to assist in controlling a cholera epidemic. In 1854 Brown-Séquard returned to America. His appointment at Richmond, Virginia, proved uncongenial and the facilities inadequate. Whispers went around that in his veins there ran a negroid streak. After a year he resigned and returned to Paris, for the death of Magendie had caused a vacancy at the Collège de France. Claude Bernard, however, was the successful applicant. In 1860 Brown-Séquard was invited to deliver in London a course of lectures at the Royal College of Surgeons. While in London he was approached—by whom we do not know—to join Ramskill as physician to the newly opened National Hospital, Queen Square.

Brown-Séquard enthusiastically agreed, and in a short while he prospered. Private patients flocked to him, while such honours as the Goulstonian Lectureship and the Fellowship of the Royal Society fell into his lap. He enjoyed his work at the National Hospital, and each week in the board-room he would hold clinical demonstrations which any medical man was welcome to attend. He set up house in No. 25 Cavendish Square, and he took under his wing young Dr. Victor Bazire, a fellow compatriot and later a colleague at the National Hospital.

Something went wrong, however. After four and a half years he resigned, and a little later he left London altogether. Perhaps it was because of the pressure of practice; perhaps it was because of his shattered health. Maybe it was the influence of his American wife that induced him to accept yet another disappointing job, a professorial chair at Harvard. Brown-Séquard's subsequent roving do not concern us, for he did not return to London. Let us simply recall that eventually he realized his life's ambition: at 61 years he was

Sir William Fergusson.

elected to the Collège de France. His latter-day researches were endocrinological, for he had outgrown the nervous system.

William Fergusson

The fourth man who influenced the fortunes of the National Hospital in its earliest days was the distinguished surgeon William Fergusson. Fifty-two years of age, he had left Edinburgh for King's College Hospital 20 years previously. Already his prestige was great, for he was Surgeon Extraordinary to the Queen, Surgeon in Ordinary to the Prince Consort, and later still Serjeant-Surgeon to Her Majesty. His Presidency of the Royal College of Surgeons and his baronetcy were a few years ahead. Fergusson's surgical repute lay in his technical expertness, for "he had the eye of an eagle, the heart of a lion, and the hand of a lady." Though a brilliant operator, he was better known for his judicious conservatism. He did not shine as a lecturer, largely owing to his reticence and his imperfect command over abstract subjects. He was a friendly, good-natured, and courteous man. Tall and handsome, the impact of his commanding presence was offset somewhat by a powerful East Lothian accent. Four years before the founding of the National Hospital he had been discreetly invited to visit Paris and attend the Emperor Napoleon III on account of a train of symptoms which, in retrospect, have a decidedly neurotic ring to them. Fergusson is remembered in yet another connexion. As a young anatomist in Edinburgh he had become acquainted with the notorious body-snatchers, Burke and Hare, at whose trial he was summoned to give evidence. Sir William Fergusson's acceptance of the invitation to serve as consulting surgeon to the National Hospital proved an invaluable asset, by endowing not only distinction but respectability to Queen Square.

Innovations in the First Decade

During the first decade of its existence the National Hospital had grown in wealth, capacity, and prestige. From the start it showed itself something of an innovator in hospital management. Thus it was the first to institute day-rooms, to employ male nurses, and to make modest subsistence charges in suitable cases. From its beginnings the hospital took pride in its home-like cosy atmosphere. Though bickerings went on between the Board and its employees—not excepting the resident doctors—from the patient's standpoint it was a friendly hospital. As a pioneer in electrotherapy it became well known for its department of physical medicine. Thus we read in 1866: "the electrical room—a model of its kind—it is, we think, the only room of the sort in English hospitals." Two years later the *British Medical Journal* wrote: "To each ward is attached the usual day-room—an improvement introduced in England by this hospital and which is found to exercise a most beneficial effect on the health and comfort of the inmates. In each day-room is a library and everything is furnished in the homely and tasteful manner which characterizes this whole hospital . . . the baths consist of hot and cold plunge baths, shower, douche, sitz, needle, Russian and sulphur baths, and are arranged in a comfortable and thoughtful manner."

Even Thomas Wakley, the firebrand editor of the *Lancet*, who—like some medical reactionaries still—heartily disapproved of special hospitals in principle, had

a kind word for Queen Square. "It cannot be doubted," the editor wrote, "that the principle of multiplying medical specialities is open to the serious objection that by favouring the isolated study of a particular disease, it tends to obscure the relations of pathology, and may thus even obstruct the knowledge of the very disease it is sought to advance. It is on this ground that we should oppose the establishment of any new hospital to be devoted to a special form of disease, unless a very strong and peculiar case of necessity were made out. We think no one can question that such a case exists for a special hospital for epileptics. . . . These were the views which, for several of the latter years of his useful life, occupied the sagacious mind of our great physiologist Dr. Marshall Hall. These views led him two years ago to propose the founding of a hospital for epileptics."

A more ambiguous note was struck by a visiting German physician who described the National Hospital as a "veritable jewel-box. The patients' rooms are furnished like the lounges of a first-class hotel, carpets, flowers, and pictures everywhere; everything is clean and elegant." He went on to say that one would search in vain here for bad epileptics or unclean paralytics, for such cases would certainly not be accepted. "The voluntary donors are well pleased with their beautiful work, but they are reluctant to have it disfigured and therefore steer clear of such elements whom they feel would tend to spoil their project."

There is also a reference to the National Hospital in *The Times* of 1873. "It differs from other special hospitals in owing its origin to no ambitious practitioner, and even to no medical instigation, but to the active and untiring benevolence of two ladies, who had witnessed, in a member of their own family, the suffering attendant

Dr. Hughlings Jackson.

upon paralysis, and who knew that the paralysed were admitted sparingly and with difficulty into general hospitals. It differs also in the number and eminence of the members of its medical staff, in the character of absolute publicity that attaches to all its proceedings, and in the general excellence of its management."

The academic reputation of a hospital does not depend upon fittings and furnishings. An international prestige is built upon the spirit of service within the wards, combined with a high level of teaching, of professional attainment, and of research. The National Hospital was indeed fortunate in its honorary staff. Men of outstanding ability—visionaries some of them; others of them patient observers—most of them brilliant teachers, such constituted the nineteenth-century staff. All were individualists and, as such, were occasionally at loggerheads, for mountain does not mingle with mountain. It would not be an exaggeration to say that of the leaders of the profession in the Victorian era many were honoraries at Queen Square.

From this company two stand out as supreme exponents—Hughlings Jackson and Sir William Gowers. Their place in the annals of the discipline of neurology is unquestioned. Very different in their personalities and achievement, they were complementary. Each held the other in high esteem. There were indeed certain common traits. Both came of humble parentage. Neither had the advantage of elaborate formal schooling, for they both finished at the age of 15. It would not be going too far to declare that both Jackson and Gowers were largely self-taught, in that they owed more to their personal exertions than to any schoolmaster. Both young men began their careers as apprentices to general practitioners. As graduates they both came under the influence of wise and experienced

sponsors—Dr. Thomas Laycock and Sir William Jenner, respectively. Jackson, who was 10 years older than Gowers, became the first assistant physician to the National Hospital, while the other filled the first appointment as medical registrar. In this way they began their brilliant yet divergent careers in neurology.

Both Gowers and Jackson were endowed with the same ability of close and accurate observation, combined with a sincerely honest method of recording. In most other professional respects, however, they differed.

Hughlings Jackson

Jackson is rightly regarded as the father of British neurology, for he inspired others by his thoughtful and interrogative attitude towards the problems of nervous function. Darwin had just published his *Origin of Species* when the National Hospital was founded in 1860, and exciting ideas were in the air. Herbert Spencer had coined the term "evolution." Jackson examined the notion in its possible bearing upon nervous function, and he was eventually led to a study of the phenomena of evolution and of dissolution within the nervous system. This doctrine was merely a single instance of Jackson's philosophic approach. It is not necessary to enumerate his many other important contributions, for they are well documented and well known. As might be expected, he was not acclaimed a pioneer at the time; he was, it must be confessed, not really comprehended even by his able colleagues. As Hazlitt has said, the chief disadvantage of knowing more and seeing more than others is to be not generally understood. Jackson seemed never to be addressing a contemporary audience. His ways of thinking became accepted only after a considerable interval, and then largely through the intermediary of such interpreters as Pick, Freud, Sittig, Head, and von Monakow. Neurologists, however, almost in spite of themselves, unwillingly became Jacksonians, and whatever we British exponents to-day possess in the way of a philosophy of neurology we owe mainly to Jackson.

Jackson himself was of course largely responsible for his intellectual isolation. Unlike most of his colleagues, he could not teach; neither could he write clearly or crisply. He did not attend medical meetings, for he was fidgety and quickly bored.

Though his work was not fully understood by his contemporaries, it was eventually realized that within their midst there was a genius. As Jackson grew older he found a secure place in the respect and even affection of his colleagues. He became a legend in his own lifetime.

Gowers

Gowers was different. Whereas Jackson was inclined to be untidy, and at times vague, Gowers was obsessional, perfectionist, and exacting. Equally astute as a clinician, Gowers recorded punctiliously. He had a collector's eye, for he could note, appraise, sort, and docket all of the neurological scene that went on around him. He was the supreme natural historian of disease. As I have said elsewhere, the neurological sick were to him like the flora of a tropical jungle, and his keen eye and his flair enabled him to identify, arrange, and classify. He learned to recognize the divers modifications of the banal or everyday material, while he quickly detected the rarities. To quote Moxon, he can be said to have known his diseases not only like a

Sir William Richard Gowers.

zoologist would know his species and his genera and his orders, but as a hunter knows his lions and tigers.

Gowers possessed two other powerful assets. He was a magnificent teacher, whether demonstrating a case or delivering a set lecture. In the Victorian age of medicine news soon got around that the out-patient clinics at Queen Square were occasions not to be missed, especially when Gowers was in attendance. The other great accomplishment which Gowers possessed was a feeling for language and its proper employment. Both his lectures and his papers were couched in a most attractive and patrician style, yet austere and crystal-clear. So richly endowed, he brought out his *Manual of Diseases of the Nervous System* in two volumes, in 1886 and 1888 respectively. The *Manual* achieved an immediate ovation, as might be expected. Nothing like this work had been seen before; or has been seen since, for that matter. Gowers relied little upon the work of others, for all the subject-matter was garnered from his own case-notes and clinical experience. Even the illustrations were his own work, being drawings which he had made of his personal case-material. This book has affectionately but fittingly been termed the "Bible of Neurology," and there is still an axiom at Queen Square that no one who imagines he has stumbled upon something novel or obscure should neglect to consult the *Manual* before claiming originality or hurrying into print.

In 1871 Gowers, in his capacity as medical registrar, drew up the first nosological table recording the diagnoses of the in-patients at the hospital. This interesting list (see Table) has an almost modern appearance, and contrasts vividly with the neurological classification adopted by Romberg, with its emphasis on neuroses of motility, neuroses of sensibility, hyperaesthesiae, and spasms.

CEREBRAL PARALYSIS					
Hemiplegia, right	..	..	..	..	19
" left	..	..	..	..	9
Aphasia	..	..	..	..	2
NUCLEAR PARALYSIS					
Labio-glosso-laryngeal	..	..	..	..	2
Facial	..	..	..	..	1
TUMOURS OF BRAIN					4
SPINAL DISEASES					
Locomotor ataxy	..	..	..	..	4
PARAPLEGIAS					
Primary	..	..	..	..	22
Secondary to disease of vertebrae	..	..	..	..	4
SPINAL INFANTILE PARALYSIS					3
PROGRESSIVE MUSCULAR ATROPHY					2
Non-progressive muscular atrophy	..	..	..	..	2
DISSEMINATED PARALYSES					
Degenerative	..	..	..	..	1
Non-degenerative	..	..	..	..	4
TOXIC PARALYSES					
Diphtheritic	..	..	..	..	1
Lead palsy	..	..	..	..	5
PERIPHERAL PARALYSES					
Limbs	..	..	..	..	2
Face	..	..	..	..	1
EPILEPSY					65
Convulsions with chronic softening	..	..	..	..	1
Urinoemia	..	..	..	..	1
Local spasm	..	..	..	..	1
Chorea	..	..	..	..	5
Stammering	..	..	..	..	1
Cephalalgia	..	..	..	..	1
Neuralgia	..	..	..	..	1

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Jackson and Gowers were the benevolent Gog and Magog of the National Hospital, but there were other giants, too. Not far behind in brilliance and attainment were two other important figures, Victor Horsley and David Ferrier.

Ferrier and Horsley

David Ferrier was a perky and ambitious man of diminutive stature, who found his life-work only after one or two false starts. Psychology, general practice, forensic medicine, were for him the unlikely paths to neurophysiology. He was a clinician, too, and even secured a fashionable practice, but he was uneasy and undistinguished in that particular role. Again, he turned from one hospital to another until he settled at King's in 1874 and the National Hospital in 1880. Ferrier's great contribution lay in experimental physiology, and his researches were made at a particularly significant moment. They followed and confirmed the work which was being done in Germany, but, whereas Fritsch and Hitzig used one form of electrical stimulation of the cortex, Ferrier used another. The timing was also propitious in that Hughlings Jackson had propounded on theoretical grounds a conception of brain function which Ferrier was able to substantiate in the laboratory.

To Ferrier, too, credit is due in a rather unexpected way. He can be regarded as the inspirer of neurosurgery, for he repeatedly urged that certain morbid conditions of the brain were within the competency of surgical intervention. Over and over again he proclaimed that there was nothing sacred or untouchable about the coverings of the brain and that the dura was no more a barrier than the peritoneum. His beliefs were soon supported; for in 1884, at the Maida Vale Hospital, Rickman Godlee performed the first surgical removal of a growth from the brain. As a correspondent to *The Times* wrote shortly afterwards:

"It was not until Professor Ferrier had, by his experiments on animals, demonstrated the localization of sensory and motor functions in the cerebral

Sir David Ferrier.

hemispheres that the position of any diseased process by which they might be invaded could be definitely determined. . . . Dr. Hughes Bennet, under whose care the patient was, guided by Ferrier's experiments, skilfully interpreted the palsies and convulsive movements which the man exhibited, and deduced from them that a small tumour was lodged at one particular point in his 'dome of thought.' . . . Not more surely do the fidgetings of the electric needle intimate their origin and convey a meaning to the telegraph clerk than did the twitchings of this man's muscles announce that a tumour of limited dimensions was ensconced at a particular point of a particular fold or convolution of the brain—the ascending frontal convolution of the right side."

Nor was this all. It was Ferrier, too, who realized that the appropriate treatment for intractable facial neuralgia was an ablation of the Gasserian ganglion, and it was he who persuaded his surgical colleague at King's, Mr. Rose, to perform this operation.

If Ferrier inspired neurosurgery, it was Victor Horsley who was its first grand executant. The recent centenary of this great man was the occasion for a considerable amount of appreciative writing, and repetition would be out of place. It is obvious from studying the biographical studies made by Paget, MacNalty, Jefferson, Sachs, and others that Horsley was something of a **superman**. Surgery aside, he would have attained pre-eminence whatever walk in life he had chosen. He combined a powerful drive with the habits of a cold perfectionist, and a crusading zeal which bordered on the fanatical. Perhaps his true *métier* would have been that of a dedicated politician, had it not been that an uncanny manual dexterity determined a career wherein art, science, and technique were combined.

Sir Victor Horsley.

Thereafter came a succession of notable physicians and surgeons to the National Hospital, but time will not permit me to do more than recite their names. Russell Reynolds (President of the R.C.P.); Thomas Buzzard, Crimea surgeon and close friend of Jackson; Charlton Bastian, erudite but dull; Beevor; Tooth; Batten, who, like Adie and Riddoch some years later, was to have his promising career prematurely terminated; James Taylor; the mercurial Risien Russell; Farquhar Buzzard, son of Thomas; and that complex figure who deserves a biography all to himself, Kinnier Wilson. Among the surgical and specialist staff there was Brudenell Carter, Marcus Gunn, and Leslie Paton as ophthalmic consultants; Felix Semon (courtier and man-about-town), Charles Ballance, Donald Armour, Percy Sargent, and, for a year or two, Hugh Cairns.

A Flourishing Medical School

For a hundred years the National Hospital has been famed for its teaching. Instruction in the board room by the original physicians was replaced by regular extempore teaching in the out-patient clinics, where picked men would be taken on as clinical assistants. Later still, ward rounds conducted by the full physicians became popular, and "clinical clerkships" became available to aspirants of a neurological career. These valuable appointments were much prized, and many of the leading neurologists of the world had at one time served as "clerks." In addition, set lectures were held from time to time; often they were published in the medical press. Gowers's famous address on pseudohypertrophic muscular dystrophy is a conspicuous example, and it actually constituted his first lecture at Queen Square. In the last century it was unusual to invite "guest lecturers": that practice did not become the vogue until after the last war. Within the first decade of its foundation, however, we find Dr. Duchenne on a visit to London, lecturing at the National Hospital.

By the turn of the century the National Hospital constituted a flourishing medical school, with a world-wide prestige. It operated, however, as a purely domestic concern, for it was not until the post-war reorganization of the University of London that it became an integral part of the British Postgraduate Medical Federation, and became known as "The Institute of Neurology."

Organic nervous disease lends itself to the teaching art, and certain among the staff became famous exponents. Gowers, the first of the great out-patient teachers, was followed by others, including that polished but unorthodox figure Risien Russell. It was he who excelled at making lightning diagnoses, the uncanny accuracy of which evoked astonishment among those who did not observe the sequence of clues nor emulate the rapid deductive thinking.

Two other names, though green in the memory of many physicians to-day, really belong to history. These were James Collier and Kinnier Wilson. Both were superb showmen in the best sense of the word. Both were endowed with an intellectual freshness which would often light up in a revealing fashion what had previously been a thing of obscurity. Unpredictable, both of them; originals, minor eccentrics, a little flamboyant. But whereas Collier was an enthusiastic man of affairs, Wilson was not. Collier attracted a local following rather than an international one; it was

otherwise with Wilson. Both wrote in an individual style, and what they had to impart was always important. Wilson's disciples formed a small band of votaries who would meet on a Saturday in the R.M.O.'s sitting-room to meditate upon the most puzzling clinical problems in the hospital. Wilson was a lone wolf, and if there were sections to be cut, photographs to be prepared, or recordings to be made, he would do the job himself. He gave the impression of aloofness except to those few who could penetrate his detachment.

Collier was different. Always approachable, he revelled in the admiration of the crowd. It was he who instituted the weekly clinical demonstrations which have become so famed. His technique of teaching was unconventional and even startling. He was easily seduced into tricks of hyperbole, when, as Oscar Wilde said, "facts fled before him like frightened forest things." In the lecture theatre Collier would resort to every device of display, eloquence, gesture, and emphasis. Overemphasis, too, was not despised. Collier would imitate a faulty articulation, or mimic an abnormal attitude, posture, or gait.

These were but a few of the great teachers at Queen Square. Some of them are still living. Others, prematurely deceased, are still remembered—like Adie and Riddoch, both of whom could hold an audience enrapt by their power of making simple sense out of intricate and confusing data. Listeners were shown a glimpse of the fascination which lies behind the art and science of neurology.

Sometimes it is asseverated darkly that "Queen Square is not what it used to be." First said in the 'eighties, it has been whispered consistently ever since. Doubtless it will still be murmured when the National Hospital is celebrating its second century.

The ninth annual statistical report to be published by the World Health Organization sets out in some 700 pages the demographic and health conditions of the countries of the world. It contains a number of innovations. In the first part, for instance, statistics of causes of death have been expanded. In the tables on causes of death figures have been given for deaths among young children by sex and by each year of age up to 4 years. Also a new table on the cause of infant mortality by age has been included. Among the other subjects which have been either expanded or newly introduced are cardiovascular diseases, malignant neoplasms, maternal mortality, and accidents according to the nature of injury. In the second part of the volume seasonal statistics of notifiable communicable diseases are given, with the distribution by sex and by age for certain of these diseases. The third part, which relates to statistics of health personnel, hospital establishments, and vaccinations, has also been rearranged and extended. A distinction is made between physicians proper and other practitioners entitled to provide treatment under particular and prescribed conditions in certain territories of Africa, Asia, and Oceania. The data also distinguish between private practitioners and physicians in the public health service. The number of inhabitants of each country or territory per physician is also given; the figures show vividly the still urgent need for medical personnel in certain areas of the world. Statistics of nurses and midwives have also been expanded. Statistics on vaccinations cover six major communicable diseases. An attempt has been made, for the first time, to give details of the population groups vaccinated and of the units to which the figures refer—i.e., primary vaccination or revaccination. (*Annual Epidemiological and Vital Statistics, 1956*, W.H.O., Geneva, 1959. Bilingual, French and English. H.M.S.O., P.O. Box 569, London, S.E.1, price £3.)

EXPIRATORY PRESSURES AND AIR FLOW DURING SPEECH

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All wind instruments require a suitable supply of air. For speech, this air is collected under pressure in the lungs and allowed to escape through the larynx and mouth in short bursts. Roos (1936) suggested that the muscles of the larynx, soft palate, and lips are the only mechanism for controlling this outflow of air, but there is evidence that the expiratory muscles provide not a steady expiratory pressure but varying pressure pulses (Stetson, 1951). By recording tracheal pressure and the electrical activity of the diaphragm and other respiratory muscles we have confirmed Stetson's view that expiratory muscles play a large part in producing the fluctuating pressures found in speech. We have made our measurements during the speech of normal persons and of patients with complete spinal transections.

Expiration during singing and the playing of wind instruments has been studied by Floyd and Silver (1950) and Campbell (1958). Buchthal (1959) has reviewed the recent work with similar electromyographic techniques on the activity of the laryngeal muscles during speech and singing. Some of the phonetic aspects of the present research have been discussed elsewhere (Ladefoged, Draper, and Whitteridge, 1958; Draper, Ladefoged, and Whitteridge, 1957, 1959).

Methods

In order to leave the mouth entirely free, the volume-changes in the chest were measured when the subject was standing in a body plethysmograph connected to a Krogh spirometer. The plethysmograph was made by welding together two 40-gallon (182-litre) steel drums and incorporating in the lid a yoke of sponge rubber as a neck seal.

Tracheal pressures were estimated from oesophageal pressures, recorded from a small latex balloon, about 1.5 cm. in diameter and 2.5 cm. long, sealed to the end of a "polythene" catheter of 2 mm. bore. The balloon was passed through the nose until it lay about 34 cm. from the external nares. Radiological examination showed that this corresponded approximately to the level of the bifurcation of the trachea in subjects about 1.8 m. in height. The balloon in the oesophagus was filled with 2 ml. of air and, as can be seen in Fig. 1, an approximate sphere of air was held between the thin posterior membrane of the trachea and the vertebral column. Thus any changes of pressure in the trachea can be transmitted to the air in the inflated balloon. The catheter was connected to a rubber tambour, and records of the membrane excursion were