Thorax, 1980, **35**, 483–489

Two forgotten pioneers

James Carson and George Bodington

R Y KEERS

From Port Erin, Isle of Man

ABSTRACT James Carson, a Scot, graduated from Edinburgh in 1799. He settled in Liverpool where he became a successful and respected physician and where he also found time to pursue a longstanding interest in physiology and to conduct certain important experiments. He read a series of papers on these experiments and their import before the Literary and Philosophical Society of Liverpool of which the two most important were *On the elasticity of the lungs* and *On lesions of the lungs*. In the first he clarified the mechanics of respiration while in the second he suggested that this knowledge might be employed to produce temporary collapse of the lung as a therapeutic measure. Two attempts at a clinical trial were defeated by widespread pleural adhesions but the first recorded attempts at artificial pneumothorax had been made. George Bodington, a Warwickshire man, after serving a surgical apprenticeship studied at St Bartholomew's Hospital and obtained the licence of the Society of Apothecaries in 1825. He later practised near Sutton Coldfield where he was known as an acute observer and a thoughtful and fluent speaker. In 1840 he published an essay *On the treatment and cure of pulmonary consumption* in which he roundly condemned the current therapy and advocated instead fresh air in abundance, gentle exercise in the open, an adequate and varied diet, and a minimum of medicaments. Violently attacked by the reviewers he became discouraged about tuberculosis and devoted the remainder of his professional life to the care of the mentally ill.

It may appear a futile pastime, suitable only for the reminiscent or the retired, to write about tuberculosis and its association with men and events dating back to the early nineteenth century, now that we have achieved our heart's desire with the introduction into routine practice of effective antituberculosis chemotherapy. To the present generation of physicians collapse therapy and sanatorium treatment lie buried in the vaults of history. Yet, until 1950, these two measures constituted the first line of attack against pulmonary tuberculosis, contributing mightily to the reduction of the appalling mortality which had previously accompanied that disease. Brehmer and Dettweiler are the names generally associated with the beginning of sanatorium treatment while Forlanini and Murphy are credited with the original work on artificial pneumothorax. Germany, Italy, and the United States are thus represented among the great innovators leaving, forgotten and unsung, two Britons who preceded them, two men who like Tennyson

> " . . . dipt into the future, far as human eye could see, Saw the Vision of the world, and all the Wonder that would be".

Address for reprint requests: Dr RY Keers, 50 Garth Avenue, Surby, Port Erin, Isle of Man.

James Carson (1772–1843)

The first of these Britons was James Carson who, although his name is generally associated with Liverpool, was Scottish by birth and, like so many of his fellow countrymen of a studious bent, was originally destined for the Church. Becoming disenchanted with divinity at an early stage he switched to medicine which he studied at Edinburgh, graduating MD in the autumn of 1799. His inaugural thesis was entitled *De Viribus quibus Sanguis circumvehitur*,[1] a choice of subject indicating that the interest in physiological study and research which was to dominate his life had already been aroused.

He wrote little about his student days in Edinburgh save for one or two passing references in the preface to the second edition of his volume of essays. Here he records a visit to the Royal Medical Society of Edinburgh where he

was introduced as a guest, adding, in extenuation of his guest status, " . . . I never became a member of any of the Medical Societies at Edinburgh having served what may be called my Society-time in the literary and theological societies of that place, and being indisposed to enter again the arena with students, generally by several years younger than myself."[2] The fare provided at the Society that evening consisted of a paper "advocating the inutility and even danger of an acquaintance with mathematics and the physical sciences, as a part of medical education." This dissertation affronted Carson who disagreed wholeheartedly with every word and made up his mind to oppose the proposition in the subsequent discussion but, as he pondered on the phrasing of his disagreement, the president declared the debate closed and so an opportunity was lost. But the incident remained fixed in his thoughts. "The subject took exclusive possession of my mind; and in the fancied oration, in which I was refuting the doctrine . . . I selected the circulation of the blood as a part of a medical education to which the condemned sciences were necessary."[2] This evening at the Royal Medical Society not only provided him with a subject for his graduation thesis but also for a later and more detailed essay, first published in 1815, and reprinted in a second edition in 1833.

After graduation Carson moved to Liverpool where he engaged in medical practice and where he remained for the greater part of his life. He appears to have been a successful and respected physician, acquiring his share of public appointments as well as an extensive private practice, for the fly-leaf of the 1815 edition of his essay describes him as "Physician to the Workhouse Fever Hospital and the Asylum for Pauper Lunatics at Liverpool, and in charge of the Military Hospital at that Place."[3]

In 1808 his name had come prominently before the public in connection with a notable trial at Lancaster when one Charles Angus, a Liverpool merchant, was charged with the murder of a Miss Margaret Burns in circumstances of peculiar atrocity. Carson, called on behalf of the defence, "stoutly maintained his opinion as to the cause of death against that of the four medical witnesses called for the Crown . . . In the result a verdict of 'not guilty' was returned." Some angry pamphleteering ensued, and Carson defended himself in "Remarks on a late Publication entitled 'A Vindication of the Opinions delivered in Evidence by the Medical Witnesses for the Crown in a late Trial at Lancaster.' "[1]

While his practice must have occupied a considerable and growing proportion of his attention he still found time to pursue his interest in physiology and a series of papers resulted, among them being probably his most notable work *On the elasticity of the lungs.* This was initially read before the Literary and Philosophical Society of Liverpool but as that organisation had not then begun to publish its transactions, the script, together with one or two other communications, was submitted to "The Royal and to the Medical and Chirurgical Societies of London, in whose transactions for 1820 they respectively appeared."[4]

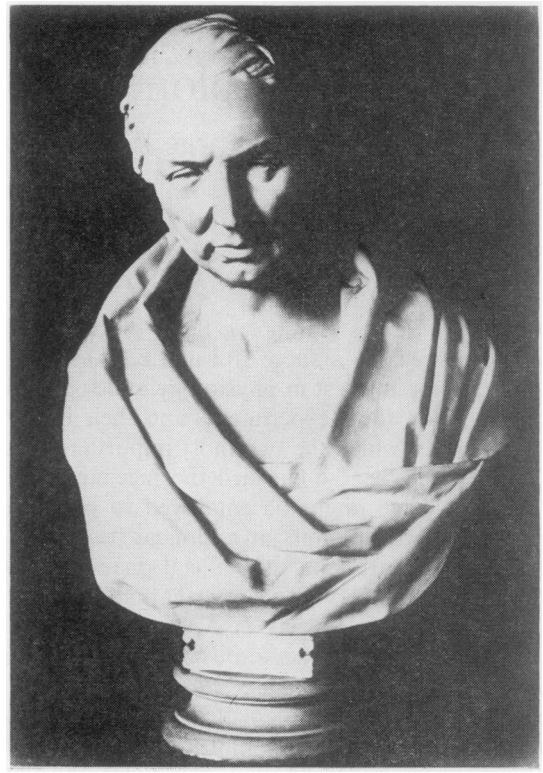

Fig 1 *Marble bust of James Carson (cast in Liverpool Medical Institution). Reproduced by courtesy of the Wellcome Trustees.*

In pursuing his researches Carson felt himself at a disadvantage, to which others had not hesitated to direct his attention, in being "a private practitioner, in a provincial town, debarred from those sources of information, and facilities of investigation, which are only afforded at the great seats of science, and with the co-operation of the learned . . . I have not been insensible to the disadvantages of my situation and have repeatedly endeavoured to render it more favourable. With that view chiefly I became a candidate for a

medical chair in the University of Edinburgh, on the death of Dr Gregory; and subsequently, and with more reasonable prospects of success, as the medical professors of that Institution, by whose opinion the Chancellor might have been disposed to have been guided, were generally favourable to my pretensions in the University of Glasgow, on the death of Dr Freer."[2] His lack of success in these two applications did not deter him from pursuing his researches and his persistence was rewarded when, on 1 June 1837, he was elected to the Fellowship of the Royal Society. The conferment of this distinction was largely attributable to his paper *On the elasticity of the lungs* in which, using a series of well-conducted and original physiological experiments, he was able to demonstrate clearly the part which such elasticity played in the mechanics of respiration. Presenting his conclusions in his favourite forum, the Literary and Philosophical Society of Liverpool, he described his experiments and then continued: "Two powers are therefore concerned in regulating the movements and in varying the dimensions and form of the diaphragm. Of these powers the one is permanent and equable, the other variable and exerted at intervals. The contractile power of the diaphragm, when fully exerted, is evidently much stronger than its antagonist, the resilience of the lungs; but the latter not being subject to exhaustion, takes advantage of the necessary relaxations of the former and, rebounding like the stone of Sysyphus, recovers its lost ground and renews the toil of its more powerful opponent. Breathing is in a great measure the effect of this interminable contest between the elasticity of the lungs and the irritability of the diaphragm."[5]

In a subsequent address to the same Society in November 1821 he dwelt on the possibility of putting this acquired knowledge of the mechanics of respiration to practical use in therapeutics. Entitling his paper *On lesions of the lung* he first stated his belief that the difficulty observed in the healing of pulmonary lesions was caused by the elasticity which kept the lung permanently on the stretch and he suggested that, if the organ were to be reduced to a state of collapse, the difficulty would be overcome. "For in this stage the diseased part would be placed in a quiescent state, receiving little or no disturbance from the movements of respiration which would be performed solely by the other lung, and the divided surfaces would be brought into close contact by the same resilient power which before had kept them asunder. A wound or abscess in this lung, would be placed in circumstances at least as favourable to the healing process, as the same affection in any other part of the body." He explained the experimental work which he had carried out and described how, when an artificial lung collapse had been produced in rabbits, the animals quickly recovered. He then continued "It not infrequently and in the early stages perhaps generally happens that the deplorable disease termed consumption has its seat in one lung only . . . The means we possess of reducing this lung to a state of collapse, or of divesting it for a time of its peculiar functions are equally simple and safe."[5] As his lecture proceeded he mentioned the need to collapse the lung gradually "by admitting a small quantity of air into the cavity of the chest at one time, and allowing an interval to exist between the successive admissions", and he even spoke of establishing pneumothorax successively on both sides for the management of bilateral disease. In the concluding portion of his address he made a special plea for the tuberculous. "No disease has been inflicted on mankind that is more to be deplored than consumption; whether we consider the number of its victims, the length, and frequently the severity of their sufferings, the age at which they are usually selected, or the moral and intellectual qualifications with which they are commonly endowed. It crops the flower of the human race. In no way, therefore, could man be supposed to approach more nearly to an exercise of the divine functions, or to render a higher and more enduring service to the world, than by discovering a cure for this disease." Having thus defined his target he then disclosed his thoughts regarding the attainment of his goal. "It has long been my opinion that if ever this disease is to be cured, and it is an event of which I am by no means disposed to despair, it must be accomplished by mechanical means, or in other words, by a surgical operation. Whether the method proposed will be found practicable, or if practicable, to the desired extent beneficial or whether, as will be supposed by far most probable, it may amuse for a moment then like all its predecessors sink into deserved neglect, are questions which must be left to the decision of time. Whatever may be the event, I shall have this consolation, that I incur no risk in this case by any proposition that may be made, of diverting the current of enquiry into a channel that shall be less productive than any of those in which it has hitherto run."[5]

Although Carson's thesis and his suggested procedure were based entirely on animal experiments he had sufficient confidence in his idea to feel justified in proceeding to a clinical trial. The

report of this trial was recorded in a later publication. The chief participant was James Sloan, an eminent merchant of Liverpool and the sole survivor of five brothers. His four siblings had all died from "consumption" and he also had contracted the disease and had betaken himself to the West Indies in an unavailing search for health. Returning to Liverpool, disappointed and depressed, he heard of Carson's novel proposition which, in his mood of black despair, seemed to offer him some hope of cure. He determined to have the operation, as Carson puts it "without any solicitation on my part," and the necessary arrangements were made. On 26 September 1822 the procedure was carried out by "Mr Bickersteth an eminent surgeon of this place, in presence of the late Dr McCartney and myself. An incision calculated to admit air freely into the chest, was made between the sixth and seventh rib. As the sound, usually heard upon an opening being made in the chest, and produced no doubt by the rapid passage of the air through the opening, was not perceived in this case, it was suspected that the lung did not collapse, and that an adhesion had prevented the entrance of the air . . . At our visit next day, when the wound was examined, our suspicion of adhesion between the lungs and the chest at the place, was confirmed at the first aspect . . . An examination by the finger ascertained an adhesion of the lung to the ribs, both above and below it; a probe found admission to a greater length across in both directions, but at length met with an obstacle. Mr Sloan suffered no inconvenience from the operation . . . The orifice was kept open, and he suffered no inconvenience from it till the day of his death, which happened about a month after the operation, and which had been deferred as far as it was suspected it could be at the time he arrived from abroad."[2] Postmortem examination showed extensive adherence in all areas: there were also large cavities in each lung.

Disappointed at the outcome Carson turned his agile mind to the devising of some alternative form of surgical procedure. If the lung was widely adherent he could see no contraindication to establishing drainage of an intrapulmonary cavity through the chest wall, and he looked for a suitable patient on whom he could try out his idea. A Mr Johnstone, "an intelligent merchant of this town", believing himself to be on the brink of the grave, asked for the operation which had been explained to him by Carson. The services of Mr Bickersteth were again called upon while Mr Samuel McCulloch, the patient's own surgeon, was also present. Extensive adhesions were found and "an incision was made into the lung." A pretty profuse haemorrhage took place, which the operator had considerable difficulty in stopping. No abscess had been reached, no purulent matter was discharged, the disease pursued its course, and in a few days terminated with the death of the patient.[2] At postmortem a widely adherent pleura was found together with a large intrapulmonary cavity which the surgeon's knife had just failed to reach.

As far as we know this ended Carson's attempts at collapse therapy or any form of surgical treatment of tuberculosis. In the pre-Listerian era in which he practised it was fortunate for his patients that he failed in what he was attempting to do, for he had proposed, in the event of success in producing lung collapse, to maintain it by keeping patent the external opening in the chest wall. Lack of practical experience hid from him the infected horrors which would have resulted while he clearly had not realised what a protracted process the healing of tuberculosis could be. This, however, is not to decry his genius or the originality of his observations and thoughts for it is difficult to deny that the first scientifically-based enunciation of the principles of collapse therapy came from the pen of this Liverpool physician who anticipated the work of Forlanini by nearly 60 years. Carson's merits were recognised and honoured by his contemporaries as his election to the Fellowship of the Royal Society shows, but his work was ill-understood and conveniently forgotten by his successors.

In the end justice was done when, in 1909, Daus triumphantly resuscitated Carson's papers,[6] and his name was rightly added to the list of those who have made notable contributions to the history of tuberculosis.

George Bodington (1799-1882)

Throughout the first half of the nineteenth century the treatment of tuberculosis, on any sort of rational basis, was non-existent. Even in Europe where Paris, Vienna, Berlin, and London represented the "centres of excellence" of the period, therapeutics was largely based on the cautery, the blister, and the lancet while the general misery of the patient was increased by the free use of purges, emetics, a near-starvation diet, and the careful exclusion of fresh air from the sick room.

In 1840 George Bodington, a country practitioner from Sutton Coldfield in Warwickshire, rose in rebellion against this horrendous regime and, in rebelling, sowed the first seeds of the

sanatorium idea. Bodington was descended from an old Warwickshire family of yeomen who had tilled their own land since the time of Henry VIII—the Bodingtons of Cubbington. He was educated at Magdalen College School at Oxford and, at the age of 16, was apprenticed to a Mr Syer of Atherstone by whom he was transferred a year later to a Mr Wheelwright, a surgeon in the City of London. He afterwards became a student at St Bartholomew's Hospital and obtained the licence of the Society of Apothecaries in 1825. Armed with this qualification he began to practise in Birmingham but, in a short time, moved to Erdington where he remained until 1843. Known to all as an acute observer and a thoughtful and fluent speaker, Bodington was always prepared to take that share in public argument and debate which he felt was required from one in his position.

His first sally into print was an essay, published in 1831, entitled *A letter on a case of asiatic cholera addressed to the President and Council of the Central Board of Health, London,* which, in essence, was a spirited attack on the treatment—bleeding and calomel—prescribed for the cholera. This was a foretaste of things to come for his second essay followed in 1840, *On the treatment and cure of pulmonary consumption,* in which he condemned current methods of treatment and suggested an alternative regime which he himself had already tried out. In unleashing his attack he wrote of "the helpless and meagre system of medical treatment of consumption in general use at the present day, the utter uselessness of which is so well-known and so obvious, that the members of the medical profession in the towns are in the habit of dismissing their patients to some far-off sea-port or watering-place where, falling under precisely the same mode of treatment, they there commonly die."[7] He deplored the use of the two popular drugs of the day, digitalis and tartar emetic, as well as the practice of shutting patients up in a close room from which fresh air was as far as possible excluded "thus forcing them to breathe over and over again the same foul air contaminated with the diseased effluvia of their own persons . . . This is, indeed, a treatment founded on the most erroneous principles, and is much more deserving of reprobation than is even the apathetic indifference and desperate hopelessness generally entertained with regard to this disease."[7]

He then introduced his own proposals for a vastly different scheme of treatment based on "the most important remedial agent in the cure of consumption, that of the free use of a pure atmosphere; not the impure air of a close room, or even that of the house generally, but the air out of doors, early in the morning, either by riding or walking; the latter when the patients are able, but generally they are unable to continue sufficiently long in the open air on foot, therefore riding or carriage exercise should be employed for several hours daily, with intervals of walking as much as the strength will allow of, gradually increasing the length of the walk until it can be maintained easily several hours every day . . . The cold is never too severe for the consumptive patient in this climate; the cooler the air which passes into the lungs, the greater will be the benefit the patient will derive. Sharp frosty days in the winter season are most favourable. The application of cold pure air to the interior surface of the lungs is the most powerful sedative that can be applied, and does more to promote the healing and closing of cavities and ulcers of the lungs than any other means that can be employed."[7]

Bodington took a house at Maney close to his own home, for the reception of tuberculosis patients who had been "recommended to remove from their homes for the benefit of change of air" and spoke of "the advantages to be derived from systematic arrangements with regard to exercise, diet, and general treatment, with the watchfulness daily, nay, almost hourly, over the patient of a medical superintendent . . . in comparison with those to be obtained by the removal of such a one to a boarding home or hotel merely for a change of scene."[7]

In addition to fresh air he allowed his patients "a nutritious diet of mild, fresh animal and farinaceous food, aided by the stimulus of a proper quantity of wine, having regard to the general state and condition of the patient." He made little use of drugs other than for sedation and for this purpose he preferred morphine.

Bodington's humane and innocuous regime was bound to prove superior to the bleeding, blistering, purgation, and starvation which was the recognised treatment of the day and he cites a series of five successful cases. Two of these may have been cases of lung abscess but the remaining three bear the hallmark of tuberculosis; all made good recoveries.

In his concluding pages he looked to the future and suggested that "there should be a certain class of practitioners who should exclusively pursue this practice as a distinct branch, to whom those in the larger towns should confide their consumptive patients, instead of sending

Fig 2 *Portrait traditionally thought to be of George Bodington, although the likeness has not been authenticated. Reproduced by courtesy of the Wellcome Trustees.*

them, as many now do, to take their chance, or probably to fall into the hands of mercenaries at some distant seaport where they commonly die, far away from friends and home. With respect to the consumptive poor patients, those who cannot afford to pay for a proper treatment of this sort, hospitals should be established in the vicinity of large towns, in fit situations, and properly appointed in all respects for their reception and treatment. In these there should be provision made for affording them carriage or horse exercise; and gardening, and farming occupations for the convalescent. The common hospital in a large town is the most unfit place imaginable for consumptive patients, and the treatment generally employed there very inefficient, arising from the inadequacy of the means at command."[7]

In these paragraphs Bodington was unknowingly sketching some of the outlines of Sir Robert Philip's Edinburgh Co-ordinated Scheme of 1886 on which the National Tuberculosis Scheme, recommended later by the Astor Report of 1912, was based.

Gazing back through the arches of the years and using all the benefits of hindsight George Bodington's essay now appears as an oasis in an arid therapeutic desert. The reader is offered a misty vision of things to come and the immediate path to be pursued is gently pointed out. In writing it, however, he had committed the cardinal sin of striking at orthodoxy. This the medical establishment was not disposed to tolerate and it closed ranks resolutely. The *Lancet* published a biting review which effectively administered the coup de grace: "The modest and rational preface with which the author introduces to us his pamphlet on pulmonary consumption has so far influenced us that we shall merely give an outline of his principles, without expending any portion of our critical wrath on his very crude ideas and unsupported assertions."[8]

Disheartened by the reception of his ideas and methods Bodington relinquished his interest in tuberculosis and thereafter devoted his whole time to mental diseases at Driffold House Asylum at Sutton Coldfield, of which he had become the proprietor and where he remained until his retirement in 1868.

He died in February 1882 when the *Lancet* made its amends for the hostile review by acknowledging its earlier error in an obituary notice. After outlining his career the writer went on to speak of his essay on *The treatment and cure of pulmonary consumption*: "In his little book Dr Bodington anticipated by many years the modern view of the treatment of phthisis . . . It is remarkable that a village doctor should have arrived in 1840 at these conclusions, which anticipated some of our most recent teachings. It is less remarkable that he met with the usual fate of those who question authority. He was severely handled by the reviewers, and so discouraged from pursuing observations which might have been of the greatest value. In 1857 . . . a writer in the *Journal of Public Health* unearthed Dr Bodington's treatise and did him tardy but ample justice. We are glad again to claim for a general practitioner the high credit of having been the first, or among the first, to advocate the rational and scientific treatment of pulmonary consumption."[9] An almost identical notice, clearly from the same pen, appeared in the corresponding issue of the *British Medical Journal*.[10]

It can fairly be asserted that George Bodington was the progenitor and pioneer of the

sanatorium treatment which for so many years was to constitute the main line of defence against the disease. The credit for its introduction is usually given to Brehmer and Dettweiler but it would be an act of gross injustice if one did not spare a thought for the Warwickshire practitioner whose humanity and common sense allowed him to assess at their true value the excesses which in the name of therapy were being perpetrated daily by his seniors and his contemporaries. His only error lay in being wise before his time.

References

1 Dictionary of National Biography. **ix:** 186–7.
2 Carson J. *An enquiry into the causes of respiration.* London: Longman, 1833: ix, vi–viii, 53–4, 57–8.
3 Cummins SL. *Tuberculosis in history.* London: Baillière,Tindall and Cox, 1949: 69.
4 Carson J. *Physiological essays.* Liverpool, 1821.
5 Carson J. *Essays: physiological and practical.* Liverpool, 1822: 23, 58–9, 64–5.
6 Daus S. 1909. Quoted by Brown L. *Story of clinical pulmonary tuberculosis.* Baltimore: Williams and Wilkins, 1941: 240.
7 Bodington G. *An essay on the treatment and cure of pulmonary consumption.* 1840. Reprinted in London by Simpkin, Marshall, Hamilton and Kent, 1906: viii, 2, 4, 16–17, 44–5.
8 Review of Mr Bodington on consumption. *Lancet* 1840; July: 575.
9 Lancet. Obituary: George Bodington MD. *Lancet* 1882; 11 March: 417.
10 British Medical Journal. Obituary: George Bodington MD. *Br Med J* 1882; 11 March: 362.