Papers and Originals

Liverpool's Contributions to Medicine*

LORD COHEN OF BIRKENHEAD,† M.D., D.SC., SC.D., LL.D., F.R.C.P.

Brit. med. J., 1965, 1, 945-948

There has been assigned to me the honour, and it is a vastly appreciated honour, of inaugurating the lectures endowed by this Medical Society which will commemorate the life and achievements of Dr. Wilfrid Edgecombe, twice President of this Society, an outstanding physician, and one of Harrogate's most loyal and devoted citizens.

I first met Wilfrid Edgecombe nearly 40 years ago, when he was touring the medical schools of this country lecturing on medical hydrology and spa treatment in the hope of rekindling the fast-dying embers of Harrogate's earlier fame in the treatment of rheumatic and digestive disorders. He was the guest of my predecessor in the Liverpool Chair of Medicine—the late Professor John Hay. Both had been for a short period contemporaries at the Medical School of the then University College of Liverpool, for Dr. Edgecombe who was born at Huyton, only a few miles from the centre of Liverpool, had not only studied there, but had held house appointments and a surgical tutorship at the Liverpool Royal Infirmary, and had demonstrated in anatomy in the Liverpool Medical School. His London M.D. reminds us that it was not until 1903 that the University of Liverpool received its Charter and the authority to grant its own degrees.

I last saw Dr. Edgecombe in May 1959, when I was in Harrogate presiding over the Annual Congress of the Royal Society of Health. During the 30 years between our first and our last meetings I was privileged to know him well, and I shall ever be grateful for the friendship of a man with such rare and versatile gifts of mind and character, which were used for so long in the service of his fellows.

When he was over 80 he published a collection of quotations from literature concerning old age, borrowing Cicero's title, *De Senectute*. But he linked these quotations with gems from his own credo, from which I have culled the following two excerpts which strikingly illustrate his own outlook:

"In the course of a long life I have been brought into contact with all sorts of conditions of men and women, and among them I have been struck by the large number who make their lives a misery to themselves and a burden to others from the habit, ingrained or acquired, of worrying unnecessarily over trifles. They lack the philosophy to realise that a large percentage of their worries are of their own making, and the remainder not worth worrying about!"

"Worry over the past, and anxiety for the future, prevents concentration on the present. After all the great secret of happiness in this life is just to have a little more to do in the day than one can do comfortably; there is then no time to grieve over what might have been or to be fearful of what may come. Concentration on the thing in hand leaves no room for nebulous daydreams that fraught the mind and lead to 'vanity and vexation of spirit.'"

He found comfort and inspiration in his religious faith, and he was guided by the golden rule; never did he attribute motives

to others which he would not have wished attributed to himself. He did not harbour grievances, though these were sometimes well founded, and in him the quality of mercy was not strained.

Early Medical Associations

In view of Dr. Edgecombe's earliest medical associations I have chosen for the subject of this lecture, "Liverpool's Contributions to Medicine." It is amusing to recall, though I do not count it among these contributions, that nearly two centuries ago a physician on the staff of the Infirmary, Thomas Houlston, attempted to turn Liverpool into a fashionable spa. In 1773 he published an essay on the Liverpool spa water in which "the nature of the chalybeate water is fully and clearly explained, its virtues ascertained, and the manner in which it is to be used; together with the particular cases in which it is proper or improper pointed out, to which are added cases of persons cured by its use." The water came from a mineral spring in St. James's Quarry, the site of Gilbert Scott's Anglican cathedral. The spring was said to have had fine qualities, a cool and refreshing taste at first but afterwards austere and inky. It imparted warmth to the stomach, and an inebriating sensation. It was beneficial in almost all diseases, and excellent for those who "fell away" without cause. Its virtues had also been set forth in a pamphlet by James Worthington, surgeon, entitled, "Experiments on the Spa at Mount Sion near Liverpool," with a view to ascertaining its contents and to investigate its medicinal properties; and, doubtless to Houlston's annoyance, this pamphlet had anticipated his own by a few months. However, their combined efforts came to naught, for 20 years later the quarry was overgrown, the spring almost inaccessible, and the healing properties of its mineral water were forgotten.

The medical history of Liverpool recapitulates in broad outline the medical history of every large provincial city in this country. Doctors began to settle in them in the seventeenth century. Hospitals and dispensaries for the poor made their appearance in the eighteenth century, and to these were attached schools for the training of doctors which were the progenitors, in the latter half of the nineteenth century, of the university colleges which were later created independent and autonomous universities.

Hospitals grew in size and number, supported almost wholly by voluntary contributions, but the Local Government Act of 1929 gave an impetus to the development of municipal hospitals, and at the time of the passing of the National Health Service Act in 1946 the local authorities, who had always been wholly responsible for the provision of mental-hospital accommodation, were providing also a large part of general hospital needs.

Although for centuries no city was immune from those plagues of epidemic disease, such as cholera and typhoid, which often decimated their populations, it was not until the middle

* The first Wilfrid Edgecombe Memorial Lecture, delivered to the Harrogate Medical Society on 11 March 1964. (Abridged.)

† Professor of Medicine, University of Liverpool.

of the nineteenth century that preventive medicine was given its proper status by the appointment of medical officers of health, and the first of these, Dr. William Henry Duncan, was appointed by Liverpool in 1846.

Accepting this as a broad picture common to all large cities, what does Liverpool supply to the canvas? It is probably true to assert, and I do this in no narrow or parochial spirit, that every field of medicine or surgery has been enriched by pioneering and fundamental contributions which have been made by Liverpool practitioners, trained in or attached to our Medical School, but I propose in this address to limit my story to three major fields—surgery, including orthopaedic surgery, tropical medicine and hygiene, and neurophysiology.

Surgery, Including Orthopaedic Surgery

Henry Park

In the days when surgery was based on the primitive and barbaric concept—"if thy right hand offend thee, cut it off"—practically every serious injury or disease of a limb was treated by amputation. The first surgeon to rebel against this practice was Henry Park. He was born in Liverpool in 1744, when Percivall Pott was appointed to St. Bartholomew's Hospital, London, at the age of 30, and John Hunter was but 16 years of age. Liverpool at the time was rapidly becoming, next to London, the largest city in England. At the beginning of the eighteenth century its population was 5,000, but at its end it was 90,000. Shipbuilding and cotton were its two reputable pursuits, but fortunes were being built on the slave trade and privateering.

The Infirmary to which Henry Park gave lifelong service was where the famous St. George's Hall now stands. Park's father was a well-known physician and surgeon. At the age of 14 Henry Park was apprenticed to his uncle, Mr. Broomfield, a surgeon to the Infirmary, but at 17 he left Liverpool to spend three years with Percivall Pott at Bart's, and then studied for a season under M. le Cat at the Hôtel-Dieu in Rouen. He returned to Liverpool, and at the age of 23 was appointed surgeon to the Royal Infirmary. He advocated the surgery of *conservation*, and was the first to treat chronic infection of the knee- and elbow-joints, which had hitherto been treated by amputation, by excision. He urged that by total extirpation of infected joints limbs "might be preserved with such a share of the motions which nature had originally allotted to them as to be considerably more useful than any invention which art has hitherto been able to substitute in their stead." His work on the *Excision of Carious Joints*, which ran into many editions, made his reputation as a surgeon, though his methods found favour sooner in France than in this country.

As was the custom of surgeons in his day, he engaged in general practice and kept a record of all the midwifery cases he attended—the so-called *Book of Genesis*—which is preserved in the Liverpool Medical Institution. It registers 4,000 births, and included in these is, "on December 20th, 1809, at 62, Rodney Street, Liverpool," that of the future Prime Minister, William Ewart Gladstone. Park, who remained in practice until his 75th year, died when he was 86. Park had carried out many physiological experiments with Matthew Dobson, who was a physician-colleague at the Liverpool Infirmary and the first to demonstrate sugar in the urine of diabetics.

Edward Alanson

In 1770, three years after Park's appointment, Edward Alanson was appointed surgeon to the Infirmary and rapidly gained a high repute with his book on *Amputation*, published in 1779 when he was only 32 years of age. In this classic work he tells that of 46 amputations at which he had assisted 10 proved fatal. This experience led him to introduce the

"flap" amputation, so that the skin could be approximated over the severed bone, and he reports 35 amputations without a single death, and all but one healed perfectly, most by first intention.

Park and Alanson were the closest of friends; they lived together in Basnett Street, not far from where Hugh Owen Thomas, a century later, and then Robert Jones, were to be the progenitors of the most famous school of orthopaedic surgery in the world. Liverpool still remains the only School to give a registrable degree in orthopaedic surgery.

Hugh Owen Thomas

For many generations the family of Hugh Owen Thomas had practised in Anglesey as bone-setters. His father, however, seeking both fortune and wider scope for his skill, came to Liverpool, the then regarded capital of North Wales, and practised with such success that he evoked the violent opposition of the vast majority of regular practitioners. This led to a famous lawsuit in which he was accused of malpractices; from this he emerged triumphant. Yet because of this suit, which impressed on him how difficult and painful is the path of the unorthodox, he saw to it that his five sons became qualified medical practitioners.

One of the five was Hugh Owen Thomas, born in Liverpool in 1834. From the age of 17 he served a four-year apprenticeship with his uncle, Dr. Owen Roberts, in St. Asaph. He then spent two years at the University of Edinburgh, followed by a year at University College Hospital, London, and Paris, and became a member of the Royal College of Surgeons. This was a few months before the passing of the Medical Act of 1858, which established the *Medical Register*. After spending a short period with his father, he practised for 11 years at 32 Hardy Street, and then at 11 Nelson Street, where, in an adjacent house, he established his hospital and workshop. This was the house later to be occupied by Sir Robert Jones and Professor T. P. McMurray until it was destroyed in the second world war. Thomas died in 1891 at the age of 56, but few then realized what had been accomplished by this dark, thin, short, fragile, bespectacled, and prematurely aged man, who employed his own printer and was his own publisher.

What was Thomas's contribution? John Hunter in the eighteenth and John Hilton in the nineteenth centuries had urged rest as the most powerful of therapeutic agents. But for Thomas rest was a creed and ritual which had to be applied with the utmost rigour. His main experience was derived from accident cases at the docks; he was no pathologist as were Hunter and Hilton, but he was a wise student of living pathology. He wrote: "If any person, with a part diseased, possesses sufficient vitality so that there be a tendency to reparation in the diseased locality, then Nature always has a mode of operation, and in very many instances, the natural method of reparation has become known to us. Indeed, the practice of medicine and surgery mainly consists of either aiding or controlling or supplementing this natural effort to resolution."

To ensure rest he devised and made his own splints in his blacksmith's shop. Although some were more or less standard—for example, the Thomas splint, which was to save thousands of lower limbs in the first world war—most of his splints were fashioned for each individual case, on the principle of an exoskeleton in order to maintain a free circulation. Only in this way, he felt, could complete rest be assured. He held also to the doctrine of "unsoundness"; for him an "unsound" part was the site of disease or injury which could then be manipulated or moulded. Hence, in diseased parts he would induce "unsoundness" by wrenching, percussing, or, anticipating Bier's hyperaemia, damming. We owe to his anatomic reasoning such simple measures as the crooked heel in flat-foot; the metatarsal bar in metatarsalgia; the gauge-halter for ensuring immobility of the upper limb; wiring in lower-jaw

fractures ; and innumerable other aids to the management of bone and joint affections. He concerned himself with "movements" and not "muscles" ; and with the functional capacity of a limb rather than its aesthetic appearance. He had that genius which is an infinite capacity for taking pains. His day began at 5.30 a.m. ; he then carried out visits until 8 a.m. ; there followed a surgery from 9 a.m. to 1 p.m. ; then came his afternoon round and evening surgery, followed by a further round ; and then he was busy making splints and other devices in his workroom from 9.30 p.m. till midnight. On Sunday he held a free clinic.

Sir Robert Jones

Sir Robert Jones was Hugh Owen Thomas's nephew. In 1922 he wrote of his uncle: "I lived with him in close and affectionate communion for over 20 years of the most strenuous period of his professional life . . . when he preached as one in the wilderness, when his work was either ignored or discountenanced, when only one surgeon in Liverpool of scholastic attainment and vision realized the importance of his work." This surgeon, I might interpolate, was Rushton Parker, who was still Professor of Surgery when I was a student at the University.

Robert Jones's contribution to orthopaedic surgery is perhaps best summed up by John Ridlon, of Chicago, who had first visited Hugh Owen Thomas in 1887, and wrote of Robert Jones in 1933: "To go from Thomas by the same road was not an easy matter. To my mind, one of the greatest things Robert Jones ever did was to make the main principles of Hugh Owen Thomas acceptable to the medical profession."

Robert Jones was born in 1857 in Rhyl, North Wales. He followed the family tradition and qualified as a doctor, after which he joined Hugh Owen Thomas. In a short time he was appointed as surgeon to the Stanley Hospital, and a little later to the Royal Southern Hospital. In 1888 the Manchester Ship Canal was being constructed and on it were engaged 20,000 workmen. Robert Jones acted as consultant surgeon to this undertaking, and during the course of five years he treated 3,000 accidents. This meant experience in the organization of hospital services which was to stand him in great stead when he was called upon to be the architect of the orthopaedic services in the first world war.

In dealing with the accidents which occurred during the construction of the canal, Robert Jones applied the orthopaedic surgical principles of Hugh Owen Thomas, and his warm, friendly personality and less aggressive advocacy, when contrasted with those of his uncle, led to their wider acceptance. Both Robert Jones and his medical colleague at the Royal Southern Hospital, Dr. C. J. Macalister, believed that there were hundreds of children suffering from chronic diseases who could be cured by prolonged residential treatment in a suitable institution in the country where they could enjoy rest, fresh air, sunshine, and good food. Thus was born the Royal Liverpool Country Hospital for Children, at Heswall, the prototype of many of its kind later to be built throughout the country. Still later, with Dame Agnes Hunt, with whom Sir Robert Jones worked during the first world war, was established the now internationally famous Orthopaedic Hospital at Gobowen. In 1909 Robert Jones was appointed Lecturer in Orthopaedic Surgery in the University of Liverpool ; this led to the School of Orthopaedic Studies and later to the degree of M.Ch.Orth awarded by the University.

Thus before the first world war Robert Jones's reputation had been consolidated, and orthopaedic surgery firmly established in this country, but it was in August 1914 that the hour struck for the revelation of how Hugh Owen Thomas's principles could be applied with the genius of Robert Jones to serve the Allied cause. When war broke out Robert Jones was 57 ; but he joined the Army, was horrified by what he saw, sent a most

damaging report to the War Office on the standards of treatment, and was authorized to establish orthopaedic centres. He introduced the Thomas splint for the treatment of compound fractures of the femur in France, and immediately the death rate from this injury fell from 80% to 20%. Both before and after the war he never ceased to preach the principles of rehabilitation. In several classical papers he urged that the repair of injury or disease, and the minimizing of crippling or disability, was not the final objective of treatment ; not until the patient was restored to his maximum capacity to work and enjoy life had the aim of treatment been achieved.

When Liverpool University conferred its Honorary LL.D. on him, the public orator declared :

"Just as in the sixteenth century Ambroise Paré revolutionized the treatment of war wounds so has Robert Jones in the twentieth. He has been the means of saving to the Empire and to our allies a vast number of lives ; to him and to his practical teaching and influence we owe it that our streets to-day show relatively so few war cripples."

His disciples were to spread his gospel throughout the world, so that crippling and deformity, from nature or nurture, were no longer to be major contributions to human helplessness and misery.

F. T. Paul

There were other surgeons on the Liverpool scene who in the latter part of the nineteenth century were to achieve international fame, and among these was Frank T. Paul, whose tube, described in 1891, is as well known as Thomas's splint. His contributions to the surgery of the colon and to the operations of gastroenterostomy and of thyroidectomy in Graves's disease (he had in 1897 operated on six cases without a death) are now classic. Moynihan regarded Paul as the neatest operator he had ever seen, and Frank Jeans, when presenting to the Liverpool Medical Institution a bronze cast which he had commissioned of Paul's hand, said, "Paul operating in the hey-day of his career always made me think that he did with his hands what Pavlova did with her feet, only Paul's work was much more useful." In his reply Paul reminded Jeans that "the gentle touch comes from the heart rather than from the hands," and if proof of this were needed one can quote Paul's record of 1,000 amputations of the breast for cancer without a death, and 1,000 operations for appendicitis with three deaths, all with general peritonitis before operation.

Tropical Medicine and Hygiene

The next major contribution which I must mention stems from the primacy of Liverpool as a port in close association with tropical zones. In 1898, Joseph Chamberlain, then Secretary of State for the Colonies, urged the need for scientific inquiry into the causes of malaria, and for special education in tropical medicine for medical officers of Crown Colonies. In the same year the shipowner Sir Alfred Jones founded the first school of tropical medicine in Liverpool (London was to follow), and the first dean and lecturer appointed was Ronald Ross at a salary of £200 a year. A year earlier Ross had made the prodigiously fruitful discovery of the transmission of malaria through the anopheline mosquito. After his appointment there were many expeditions to West Africa on mosquito control, and malaria was eliminated in areas where Ross was allowed to destroy the breeding-swamps of mosquitoes. Following this, research centres were set up in West Africa and on the Amazon, and many fruitful discoveries for the control of tropical diseases were made. In 1913 Ross was succeeded by James Stephens, the discoverer of the fourth malarial parasite—*Plasmodium ovale*. Stephens's successor in the chair was Warrington Yorke.

In the 1920s Warrington Yorke had pioneered the malarial treatment of G.P.I. and neurosyphilis. It was Warrington Yorke who foresaw the dangers of Japanese intervention in the last war, and the overrunning of Java, the major source of the world's supply of quinine. It was his enthusiasm and energy which led the Governments of the U.K. and U.S.A. to provide mepacrine, which had been developed as an antimalarial drug in the inter-war period, so that by 1942 there were adequate supplies to forestall disaster. Warrington Yorke played an important part in the testing of Paludrine, and it was his method of maintaining trypanosomes alive in culture which led the way to the treatment of sleeping sickness and kala-azar with the diamidine group of compounds. Indeed, Wenyon, in the obituary notice on Yorke written for the Royal Society, observed: "He had been instrumental in introducing for the treatment of two of the most intractable tropical diseases remedies which will lead to the saving of many human lives."

Neurophysiology

Measured in terms of fundamental contributions to knowledge the brightest star of the Liverpool firmament was Charles Scott Sherrington—the greatest physiologist since Harvey and "the philosopher of the nervous system." I have described in my monograph on *Sherrington* how, between 1895 and 1913, when he occupied the George Holt Chair of Physiology in Liverpool, he laid the foundations of neurophysiology. His work is so well known as physiologist, philosopher, and poet that I do not propose further to refer to it. But one of his predecessors in the Chair of Physiology, Richard Caton, who was a physician on the staff of the Royal Infirmary, Lord Mayor of Liverpool, and one of the founders both of University College, Liverpool, and of the Tropical School, carried out fundamental work on the electrophysiology of the nervous system which anticipated modern electroencephalography. I

have paid a tribute to his contributions in a paper to the Section of History of the Royal Society of Medicine.

Conclusion

Time has permitted reference to but a tithe of those in the history of the Liverpool School of Medicine who have made lasting contributions to knowledge. In any comprehensive survey it would have been necessary to mention that in Liverpool was started by William Rathbone (aided by Florence Nightingale) the first District Nursing Association; that in 1902 Liverpool established the first chair of biochemistry in the world, and appointed to it Benjamin Moore; that in Liverpool diagnostic radiology was very early established by Thurstan Holland, who became the first President of the International Congress of Radiology, and established the first diploma and degree in radiology; that the Royal College of Obstetricians and Gynaecologists owes its birth to Blair Bell, who was its first president. Indeed, the pioneering spirit of Liverpool in medicine is almost endless.

A pessimistic critic at the end of the eighteenth century wrote of Liverpool: "Art and science are inimical to the spot; absorbed in the nautical vortex, the only pursuit of the inhabitants is commerce. Liverpool is the only town in England of any pre-eminence, that has not one single erection or endowment for the advancement of science, the cultivation of the arts or promotion of useful knowledge. It may truly be said with the son of Sirach, that wisdom cries out in the streets and no man regards it."

Enough, however, has now been said of Liverpool's medical achievements in the past 150 years to obliterate the stain, and to pardon the inordinate pride that Wilfrid Edgecombe must have felt at being an alumnus of a School to which humanity owes so great a debt.

Surgical Treatment of Carcinoma of the Bronchus

J. R. BELCHER,* M.S., F.R.C.S.; R. ANDERSON,* M.B.

Brit. med. J., 1965, 1, 948-954

During the past 15 years the incidence of carcinoma of the bronchus has more than doubled in Great Britain. Although lamentably few patients are found to be amenable to any sort of treatment, resection still offers the best hope of cure. A study has therefore been made of the patients who were admitted to hospital with bronchial carcinoma under the care of one of us (J. R. B.), and who had a thoracotomy done during this period.

These patients have been reviewed to see how the pattern of the surgical treatment has changed in these 15 years, whether there has been any change in some aspects of the disease itself, what the survival rate has been, and some of the factors that might have influenced it.

Policy

The policy on which the surgery was based changed little during the 15 years under review. Apart from general metastases, the contraindications to surgery were, with few excep-

tions, as follows: phrenic-nerve paralysis and recurrent laryngeal paralysis (but not Horner's syndrome or Pancoast's syndrome); superior vena caval obstruction and radiologically visible right paratracheal glands in left-sided lesions; blood-stained pleural effusions (but not clear effusions), the assumption being that these were due to widespread pleural secondaries; and invasion of the trachea by tumour, but not invasion of the chest wall.

Apart from these phenomena, due to the disease itself, respiratory insufficiency was the commonest reason for advising against thoracotomy. A forced expiratory volume in one second of less than 1,200 ml. and a forced expiratory ratio of less than 50% were regarded as the "borderline," and in general it was felt that if a patient's respiratory function precluded pneumonectomy it probably made the risk of lobectomy too great as well. It is in this field chiefly that the indications for surgery have narrowed in the period under review.

Advancing age was no bar to surgery, although, as the figures show, the results in patients over the age of 70 were poor, and increasing awareness of this recently led to more hesitancy in recommending surgery in this age group.

* London Chest Hospital.