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Address.

SIR JAMES PAGET AND PAGET'S DISEASE.*

By ELLIOTT C. CUTLER, M.D., BOSTON.

I. PAGET'S DISEASE.

My claim to talk on Paget's disease of bone, does not rest with any exceptional interest I may have, as a medical man, in this affection, for it does not seem to be within the realms of possibility that the successful treatment of this disease shall come through surgical efforts. But, as to all students of medicine imbued with sufficient curiosity and the values of a historical background, diseases appeal which are named after their discoverers, so in this instance, because of the name, I was led to a study of the man and his times. The effort was a thousand times repaid, for James Paget is one of the great men in modern medicine. I say modern, for he lived through the years when anesthesia was discovered and had as contemporaries Pasteur and Lister.

And to talk on Paget I have full right, because he was, first, a great surgeon, though much of his greatness was obtained because of his scientific efforts, his teaching, and his literary gifts. I found his life tremendously stimulating and interesting, and indeed it constitutes an ideal whose study will be of vast benefit to all medical

* Read at the meeting of the historical section of the Harvard Medical Society on Jan. 4, 1916.

students and a fine example to any who care to model their lives thereafter.

To clear up what may confuse some of you, I will merely recall that there are two diseases called Paget's disease. In 1874 Paget read a short report on "Disease of the Mammary Areola Preceding Cancer of the Mammary Gland." At the present time, cancer of the breast, beginning about the areola, usually as an intensely red, raw, finely granular skin lesion, is known as Paget's disease.

In Paget's disease of bone, called by him osteitis deformans, we are more interested, and it is in relation to this disease that Paget's name is most often recalled. His original communication I have here; it came out in 1876, when he was sixty-two years old, and is entitled "A Form of Chronic Inflammation of the Bones." Now this disease forms a definite clinical picture in its outward aspects and it occurs to me that, like Addison's disease, Parkinson's disease and Hodgkin's disease, it was the external manifestations of the disorder that attracted Paget's curiosity and observation and made him study further a group of cases so evidently unusual. Even now there must be many unrecognized disease entities amongst us which we may even see frequently, but doubtless their outward manifestations are obscure and vary so greatly that even our best observers fail to detect them.

Paget himself called this bony disorder a rare disease of bone and it still remains such, though some 200 cases have been reported in the literature. Since Paget pointed out the characteristics which we shall discuss, studies of the past literature and old museum specimens have re-

vealed many unrecognized cases. Jonathan Hutchinson himself claimed to have found a typical example in a mummy's skull from Egypt. Yet, that it is still a rare disease is shown by the fact that of 285,000 out-patient cases at the Massachusetts General Hospital, in the years 1903 to 1915, only 7 cases are recorded as definite examples of this disorder.

Now, as I have suggested, the clinical picture is pretty definite except in the cases where a single bone is affected. These cases are extremely rare and the diagnosis rests entirely with the x-ray findings. It is essentially a chronic disease of bone occurring in middle or late life and usually unattended by any symptom other than those of skeletal changes, except for grumbling rheumatic pains in the parts affected. Paget himself paints the picture clearly as follows: "The disease begins in middle age or later, is very slow in progress, may continue for many years without influence on the general health, and may give no other trouble than those which are due to the changes of shape, size and direction of the diseased bones. Even when the skull is hugely thickened, and all its bones exceedingly altered in structure, the mind remains unaffected. The disease affects most frequently the long bones of the lower extremities and the skull, and is usually symmetrical. The bones enlarge and soften, and those bearing weight yield and become unnaturally curved and misshapen. The spine, whether by yielding to the weight of the overgrown skull, or by change in its own structures, may sink and seem to shorten with greatly increased dorsal and lumbar curves; the pelvis may become wide; the neck of the femora may become nearly horizontal, but the limbs, however misshapen, remain strong and fit to support the trunk."

Further, in describing his first case, he emphasizes strongly the postural defects. "The shape and habitual posture of the patient were thus made strange and peculiar. His head was advanced and lowered so that the neck was very short, and the chin, when he held his head at ease, was more than an inch lower than the top of the sternum. The short, narrow chest suddenly widened into a much shorter and broader abdomen, and the pelvis was wide and low. The arms appeared unnaturally long, and though the shoulders were very high, the hands hung down by the thighs and in front of them. Altogether, the attitude in standing looked strangely in contrast with the large head and handsome features."

The pathology is characteristic and borne out by the x-ray findings. It consists in a destruction and absorption of the bony tissue in the part affected; phagocytes and giant cells attack the bone, which disappears with confluence of the Haversian systems and trabeculation of cortical substance; but at the same time proliferation goes on, new bone is laid down in the mar-

row cavity, in the new spaces left by the destruction of the old cortex and also on the surface of the bones. The new bone at first is lacking in bone salts, and Paget himself found that phosphorus, calcium and magnesium were less than normal in affected areas. Thus the structure, though thickened up and larger, is less strong and gives way before the weight of the body, producing in the spine and lower extremities the characteristic deformities.

(Lantern slides were then shown, illustrating by photographs of patients and x-rays of separate bones from different localities, all the typical characteristics of the disease. In addition the plates from Paget's original case were reproduced and finally two portraits of Paget and an engraving of St. Bartholomew's Hospital, made in 1844, were shown.)

II. SIR JAMES PAGET.

James Paget was born in Yarmouth, England, in 1814 and died in London in 1899. These 85 years were filled to overflowing always with incessant activities, and indeed, it seems remarkable, to me, that a man could work so continuously and so hard and yet survive to such a ripe old age. It is interesting for those of you who are connected with the medicine of Boston to recall that it was in 1810 that Warren and Jackson started the foundation of the Massachusetts General Hospital, which received its first patient in 1821.

Stephen Paget, the father, was a brewer and ship owner, prosperous, temperate, refined, public-spirited and generous. The mother was a splendid woman of better social position. Paget speaks of her father as a real gentleman who left as a legacy only the gout, of which he himself inherited a most troublesome share. She was a handsome, strong-willed woman, best remembered for her intense love of her children, but also for her great industry and skill in writing, needlework, and painting. Such then were his parents and Paget boasts he was well born!

It was a large family, 17 children in all, nine growing to full age, of whom James was the seventh. All were well gifted, two being artists of considerable skill, and one an entomologist of note.

Paget speaks of his schooling as being fair. It took place in a small boys' school in Yarmouth, where he states they progressed in mathematics to the quadratic equation and to unknown depths in Homer and Zenophon after Caesar, Sallust and Euclid! Anyway he made the best of his opportunities and early distinguished himself by being head-boy in the school for his last two years there.

At 16 he was through this school and it was determined he should be allowed to enter the navy. Indeed, his father had already written a letter to a friend, asking for a commission, when thinking better of it, he kept the letter over night and destroyed it the next morning. There

was much turmoil and inward struggle for young Paget, but what a lucky bit of suffering it was!

Apprenticeship. 1830-1834.

So it was determined he should become a surgeon, and at 16 he was apprenticed to Mr. Charles Costerton, the active and energetic local practitioner. Here he was to assist for four and a half years and then be allowed to go to London to study. Paget at once set himself to work with great enthusiasm and energy. He kept the office, the accounts, learned to put up medicines, the dispensing of drugs and care in minor surgery. He writes of the time spent in this work as too long, but his interest was unflagging. He saw much work of our out-patient class type and speaks of varicose ulcers as being useful for bandaging, and the experiences in injuries, minor sicknesses, etc., quite valuable. He studied hard at books, taught himself French and learned considerable anatomy.

During all these years he was a keen student of botany, in which he early displayed great interest. He was always walking about collecting and observing, and indeed an old lady of Yarmouth wrote, "that young Paget walks about the country too much to be a student of medicine." His thirst for knowledge in the things he was interested in was unquenchable, and he speaks of digesting fully a book on botany of 36 volumes, which he found in his father's library. The result of this botanizing was the joint publication with his brother Charles of a book entitled, "The Natural History of Yarmouth." This came out in 1834 when he was only 20 years of age and remains even today, because of its thoroughness and accuracy, a distinct authority on the local flora. It won him the recognition of Sir William Hooker, then the greatest botanist in England and a celebrated scientist. In looking backward from the prospective of his whole life, the value of this training in botany cannot be overestimated. In the first place it was self taught and next it made him an accurate observer. It gave him a scientifically inquisitive mind, taught him the value of going to books for reference and knowledge and by the success of the published effort brought him into contact and friendship with really scientific men and gave him a taste for the exposition of his work.

Hospital Pupilage. 1834-1836.

In 1834, when 20 years old, he went to London and entered the medical school of St. Bartholomew's Hospital. This had been for many years the greatest of the London Schools and through its great surgeons of the past, Abernethy, Percival Pott and others had become especially noted in its surgery. At the time Paget entered, the interest in the school and in teaching had somewhat fallen away and disorder was beginning to prevail in the staff and school. But Lawrence, then the surgeon to the hospital, was

at the height of his fame and his talks were the great mainstay in the school. He was an impressive speaker, knew his subject well and got perfect attention. From Stanley, the anatomist, Paget got much, and in after life he speaks of learning from him the value of dull, careful painstaking work. Paget himself became a beautiful dissector and was always at work on this subject. The museum of the hospital was well rounded and equipped and a constant source of enjoyment to the boy. He read a great deal; indeed he never seemed to sleep, and during the evenings of his first year taught himself German. This gave him much repute, for but one other student knew this language and but few of the staff. The result was that older men, clinicians, and even his teachers brought him foreign publications for translation and thus he came into contact with many more medical people with whom acquaintanceship was valuable. It was during this year that he made the discovery of the parasite "*Trichinella spiralis*." For years in the dissecting rooms the small white flecks had been noted in the muscles of subjects, but Paget's curiosity and thirst for exact truth led him on, even to borrowing the use of a microscope, then indeed a rarity. It was then that he observed the parasite, encysted in its capsule, made drawings and called the attention of others to his finding. One of his instructors, Owens, borrowed the drawings and reported the discovery, giving Paget full credit. At the end of this first year he graduated first in all four subjects and thus through his industry, ability and success was already a marked student.

Of the vacation at the end of his first term he writes, "I do not remember the occupation of the vacation time," but doubtless it was well taken up with work of some kind, for he never rested or let his interest slacken. During the second year he was more in the hospital and about the wards, seeing and studying actual cases, much as our clinical clerks do now-a-days. At the same time his interest in the Post-mortem room continued and he was busy at all odd moments with dissections. His knowledge of anatomy was excessive already. At the end of this term he was again first in all subjects studied and his success with his classmates was very popular, for his abilities and industry were well known and recognized. He himself writes that in those years he must have had a "great facility for cramming," for in his examination in medical jurisprudence, he afterwards found he had quoted almost verbally whole paragraphs from a book on this subject he had read just previous to the examination. During this year he passed for the College of Surgeons, and his accurate and comprehensive knowledge of anatomy is shown by the fact that when in this examination he was asked to tell about the fifth nerve, he gave a full description of the otic ganglion, a then little known subject.

Waiting Time. 1836-1843.

And now at 22 he was ready to practice surgery. The question at once arose of where to go. Two choices were open, local country practice or to stay on in London and to hope, with time, for a position on the hospital staff. Of course he chose the latter, despite the difficulties, and there were many obstacles, primary of which was his absolute lack of funds. His father was to send him ten pounds a month when possible, but as the latter had already entered on the years when his business steadily failed, this was a most precarious source of support. However, the die was cast and Paget had hopes that by tutoring, journal work and a rare case he could eke along. Curiously enough, he very soon became engaged to be married, of which he writes, "it is not to be pretended that wisdom, discretion, forethought or any method of sound judgment had anything to do with it," adding, however, later, "this indiscretion was the happiest event of my life." Certainly his marriage, fulfilled eight years later, was a very happy one.

Following his graduation from the school, seven hard years passed by before any promotion came, years of unremitting, colorless work. But with all the drudgery and hours of disappointment, there were bright moments, and the vast amount of knowledge acquired and work done was unquestionably the basis for his future great success. These seven years are best called his "waiting time" and they are necessary years for all who would rise to such heights. Of these years, Paget writes very haphazardly. He was waiting for a hospital appointment. He tried his hand at everything; teaching, museum work, had a very rare case, but mostly it was reading and abstracting and translating for journals. There was one trip to Paris from which he returned a bit broadened and with a wider range for thought and study, but he was not much stimulated. He learned Italian and Dutch so as to get more work and better positions on the various journal staffs for which he labored. He wrote for the *Penny Cyclopaedia* and the *Biographical Dictionary*. And he kept very long and late hours.

After a few years he became curator of the museum, where his time was taken up with arranging and sorting specimens, drawings, dissections, etc. It was a good apprenticeship for the position of Demonstrator of Anatomy, which came later, and also, it led to his writing the "Pathological Catalogue of the College of Surgeons Museum."

This all kept him from practice but he "had to live."

In 1839, he had typhus. Later in the same year he was made Demonstrator of Pathological Anatomy and in 1841, Demonstrator of Anatomy. He was very popular with the students and his vast amount of reading kept him so well informed of the most modern ideas in medicine that he talked easily on all subjects. He wrote

a general anatomy which was refused. It was a bitter disappointment but he consoled himself with the thought that he had learned much in preparing it. From now on papers followed in rapid succession. In reviewing a summary of his publications, I counted 147 publications of books, addresses and reports and there were many others. In 1842, came a paper on "The Chief Results Obtained by the Use of the Microscope in Anatomy and Physiology." And always he was a great pleader for the microscope. It was one of the most valuable inheritances from his botanical education.

These seven years of waiting were ones of the most confined, unremitting labors. He kept terribly late hours, was a tremendous reader, an enthusiastic student and became an admirable teacher. Of patients he had very few, his receipts for these seven years from patients being 94 pounds, something less than \$500. Think what dull years on the surface they appear to be, and yet they were unquestionably the most fruitful of all, for in these years he trained himself. He became the most widely read medical man of his time and his knowledge of French, German, Italian and Dutch put him in touch with all the scientific work going on. He, therefore, was more up to date than any of his contemporaries and admirably suited for whatever the future might bring.

I think these years, coupled with his wonderful start and his interest and training in botany, gave him the basis for all that came after; for in botany he learned the value of careful and correct observation, and in school, the advantages of dull, laborious study. In the seven years of waiting he added a fund of knowledge that made him the most resourceful and scientific medical man in England for the next thirty years.

Promotion. 1843-1851.

Finally in 1843, when he was 29 years old he was elected to fill the new chair in physiology and was made Lecturer in Physiology. For this position he was admirably suited and there was no contender for the position. His lectures were a great success. He had read everything and had tested out most that he had read. He spoke well, his lectures were well attended and perfectly listened to. The best of his pupils was Kirkes, a clear headed industrious boy, who shortly afterwards published a "Text Book on Physiology" which consisted practically of his notes of Paget's lectures. And indeed Paget became a really gifted speaker and gained much notoriety this way.

Soon after he was given this appointment, St. Bartholomew's established the collegiate system, chiefly through Paget's efforts. Quarters were taken in which many of the hospital pupils came to live and Paget was made regent of the college. This rapidly proved most successful, for boys studied medicine very young in those days and thoughtful parents at once saw the advantage of having their sons live in a college under

the guidance of some older and more thoughtful spirit. The fact that almost all the prizes in the school were taken by those boys residing in the dormitory or college building shows that the better class went thither and also that Paget's influence was indeed a stimulating one. He married shortly after this and for eight years lived in the college dormitory. His life now became much fuller and more happy but there was no remission or let down in his work. The cares of the college, the school and his lectures took all his time. He gave up his journal work.

Soon promotion and new offices came. First the assistant surgeoncy to the hospital and then Professor of Surgery and Anatomy to the College of Surgeons. He now completed his catalogue of the hospital museum and also the pathological catalogue of the College of Surgeons, at which latter work he writes he was at work "every day for seven years." In 1843, he was one of the original 300 Fellows of the College of Surgeons. His lectures there, as Professor of Anatomy and Surgery, formed the basis of his book, "Lectures on Pathology," published in 1853. In 1861, he became a Fellow of the Royal Society. Again, in a lecture on "Recent Progress in Anatomy," he emphasizes the great strides due to the use of the microscope,—"The microscope must be used before we can approach the knowledge of one of those truths for want of which we are still constantly practicing in doubt."

In 1851, he resigned the wardenship of the college, moved into a new home and began to practice medicine. During this second period of seven years, his so-called academic years, Paget had worked almost without intermission, usually till 1 A.M. Lectures, school administration, publications and writings left no time for anything else. It is remarkable that he could have kept up the pace.

Private Practice. 1851.

Paget was now 37 and his life as a great and very successful surgeon began. For those of you who are already, as students or internes, desirous of getting into private practice and chafing at the passing years, there is much philosophy in these fourteen years of Sir James Paget. And none of you can afford to miss the opportunities to study them well.

If up to now his work had been hard and laborious, it may be said there was no diminution in the hours at work in the years to come. He was always working at top-speed. Besides a tremendously active practice there were lectures, offices in multitudes of societies, public positions, publications and duties end on end. His success in practice is well shown by his income. This rose rapidly to 700 pounds a year, then gradually to exceed 10,000 pounds, (over \$50,000), till at 64, he gave up his hospital appointment and active operating, from which time it decreased. He had the very best practice in London and his attendance on the Royal Family as

Lieut.-Surgeon to Her Majesty and the Princess of Wales brought him a great reputation as well as a baronetcy. He acquired an immense consulting practice, which he speaks of as the most interesting because it brings "the largest number of interesting cases, the least work, the greatest responsibility, the most agreeable associations and the best position and relation with one's brethren in the profession." He was very popular with both the profession and patients, but always considered the former as by far the more valuable and important.

In time he succeeded to the Surgeoncy and the position of Lecturer on Surgery in the Hospital. He was constantly overworked and run down, averaging 16 hours at work a day, year in and year out. As a result there was some sickness, including six attacks of pneumonia between 1851 and 1870, of which, he writes, "had they been cared for would have made hard work almost impossible." To me, as I have said before, one of the most extraordinary things is that Paget did live to be 85. In 1871, when 67 years old, he poisoned himself during a post-mortem examination. After an illness of three months, which doubtless was greatly prolonged because of this past overwork, he resigned his hospital appointments to his great regret. He says of himself, "I was very heavily overworked, was liable to trouble in my lungs, and not unlikely to break down in such rush and haste as I sometimes lived in." He continued in private practice for some years still and worked even harder than ever, fearing lest people should think him about to retire.

Now throughout all these years ran his constant gifts to medical knowledge. He was a most prolific contributor, and the numbers of lectures he gave and meetings of societies he attended is extraordinary. He belonged to most of the medical and scientific societies of Great Britain, the Continent, and America. (Among them the Massachusetts Medical Society). He was on all sorts of boards and committees and held many active and honorary offices. There were few vacations and he cared little for sports or animals.

He had numerous friends, many of them of wide repute. Gladstone, Newman, Ruskin, Ten-nison, Lowell, Tynsdale, Oliver Wendell Holmes, Huxley, Pasteur and Darwin were among his intimate acquaintances, and what a group it was!

In 1895, Lady Paget died, and from this time he seemed to fail. But he fought his old age with good spirits, and up to his last year, when the Bible was his constant source of reading, he kept at his medical readings, studies and the analysis of his past work and cases. Finally, while at a children's party at his son's home Christmas Day, 1899, he caught cold and within a week succumbed to broncho-pneumonia.

It had been a remarkable life, very full, very active and satisfactory and led him in his old

age to a position from which he could with real satisfaction look back on the fruits of his labors. A close study of it reveals much of interest to all, but particularly to those of the profession interested in something above ordinary success. It is a revelation of the advantages of connecting scientific learning with the practice of medicine, and a model of many of man's best qualities, and highest ideals.

Original Articles.

A SKETCH OF THE ORGANIZATION FOR THE CARE AND TRANSPORTATION OF THE SICK AND WOUNDED IN THE BRITISH EXPEDITIONARY FORCES IN FRANCE.

BY ROGER I. LEE, M.D., BOSTON.

THE following little sketch must in no sense be regarded as authoritative. It includes only what came under my own eyes in a recent trip to France as a member of the Harvard Unit. This unit took complete medical and surgical charge of a British Base Hospital and was a part of the organized Medical Department of the British Government. For a little over six weeks I participated in the activities of the unit in a so-called British Base Hospital, No. 22 General Hospital at Camiers, Northern France, and was able to see the intimate details of the workings of a base hospital. At the end of my stay there I was fortunate enough to be permitted to visit a number of the casualty clearing stations, field ambulances and advance dressing stations near and at the front.

For descriptive purposes it is easier to follow the course of patients from the firing line to the rear. At the front itself one finds the so-called advanced dressing stations. The nature of these depends entirely on the configuration of the ground and the personal ideas of the medical and military officers of the regiment. The advanced dressing station that I saw reminded one of a rabbit's hole in the side of a hill. It was a dark dug-out made of the roughest possible material, an oblong space with room for 12 stretchers on the floor. A rough wooden table and a very few simple instruments completed the equipment. The personnel consisted of two doctors and two orderlies. Wounded cases were usually seen on the field and merely brought there as a place to rest before they were transported. One was told that little or no surgery was attempted here. One must remember that outside of a big action the usual activity of an advanced dressing station is very like the accident ward in a large hospital. Soldiers come with fever, scabies, middle ears, skin trouble, sprained ankles as well as the wounds incident to desultory artillery fire.

Every disabled soldier is sent to the dressing station, and if his condition is at all serious is kept under observation over night. Here begins the preliminary sorting of cases. A fair number of minor ailments may return to the trenches. All the others are promptly transported, evacuated it is called, in ambulances which are summoned by telephone. We saw in the trenches themselves a stellate arrangement of trenches and dug-outs which was designed as a sort of hospital bay in the actual trenches. We were told that this had never been used and probably never would be used, because in any severe action sufficient to justify the use of this hospital bay, the chance of a shell exploding in the ramifications of this arrangement and killing everybody in it was too great. In times of severe action patients are merely laid on stretchers and placed in a protected spot to await their removal. From the advanced dressing stations patients are removed either to a field ambulance or to the casualty clearing stations, nearly always the latter.

A field ambulance is usually situated about five miles back of the front line and may be well compared in appearance to a gypsy encampment. The several that we saw were all the same. They were located usually on the border of a little wood. Only the actually necessary tents were in place. The three or four tents for the officers were up, and perhaps a large tent or two for patients. In case of pressure a considerable number of tents could be erected at short notice. Since five miles is within easy shelling distance, every attempt was made not to suggest to scouting aeroplanes the presence of a military encampment. The field ambulances draw their patients mainly from the reserves who are billeted in the nearby houses and villages. Patients who were not seriously sick or wounded may be sent here for further observation or treatment from the advanced dressing stations. Only a relatively small proportion of an army is actually in the trenches at any one time. The artillerymen, the reserves, the men resting after their stay in the trenches and the large number of men furnishing supplies, ammunition, etc., form a large majority. The field ambulance cares for this group. In the field ambulances there was no set operating room, but in case of emergency operations could be done. Cases remaining over two or three days were evacuated to one of the casualty clearing stations by ambulance.

The casualty clearing station is the most interesting unit of this whole organization. That is situated usually ten or fifteen miles back of the front lines and consequently out of the usual range of shells. In the casualty clearing stations one finds nurses. This is the nearest to the front they are allowed to go. We saw two fairly typical casualty clearing stations. One was in an old military prison and the other was in tents in the open. A casualty clearing station usually accommodates 600 to 800. The reason for this number is that it is the usual complement of a