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SPECIAL ARTICLE

LAENNEC: A GREAT STUDENT OF TUBERCULOSIS

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Introduction

This year marks the bi-centenary of the birth of René Théophile Hyacinthe Laennec (1781–1826), one of the great figures in the history of medicine, and one of the greatest students of tuberculosis.

He was born at Quimper, in Brittany, and his first studies in medicine began at the age of $14\frac{1}{2}$ years at Nantes, under his uncle, Guillaume François Laennec, a learned physician of that town and Rector of its University. His influence on his young nephew was incalculable, as not only did he undertake his general care and education from early boyhood, but also guided his first steps in medicine. Théophile went to study in Paris in 1801, where one of his teachers was the great Baron Corvisart, who in 1808 was to translate into French Auenbrugger's largely neglected little work on percussion, which helped to popularise this method of diagnosis. Laennec was a brilliant student who carried off so many prizes that he had to be asked to withdraw from some competitive examinations in order not to discourage his fellow-pupils. Even before his qualification in 1804 he had already made a name for himself, and indeed one of his teachers had prophesied that if he continued to work as he had done, in the space of a few years he could establish himself as the first physician in Europe.

His life and work have been extensively studied, and this paper will only attempt to outline his work on tuberculosis: a disease which he understood so well, not only as a result of his profound clinical and pathological observations, but also in his own person, as he almost certainly died from it at the early age of 45.

Previous work on Tuberculosis

To grasp the full meaning and significance of his work it is necessary to look briefly at the work of some of his precursors. One of the standard works of the immediate 'pre-Laennec' period, by Bonnafox-Demalet, published in 1804, had described some 12 varieties of phthisis, and 6 years later Laennec's friend and one-time co-worker, Gaspard Laurent Bayle, had published the results of his researches. Based upon extensive pathological studies of 900 *post-mortem* specimens, Bayle concluded that there were 6 kinds of pulmonary consumption, which he listed as tubercular phthisis, granular phthisis, phthisis with melanosis, ulcerous phthisis, calculous phthisis and cancerous phthisis.

A recent historian of tuberculosis, Dr R. Y. Keers, has written of Bayle, that 'four of his six named varieties of phthisis represented, not separate diseases as he implied, but one disease, tuberculosis, in varying phases of development and in retrospect it is clear that he had failed to grasp the aetiological identity of one phase with another. Furthermore he had been unable to separate off the cases of bronchiectasis, lung abscess and carcinoma'.

Although Bayle had added something to the knowledge of the pathology of pulmonary lesions, the fundamental idea of the unity of tuberculosis had eluded him.

Pathology of Tuberculosis

Laennec's work on pathological anatomy was very important, and at one time he contemplated publishing a treatise on the subject. This, in fact, never appeared, although the precious 800-page manuscript still exists at Nantes and Paris; but only a small part of it has ever been published. In November, 1803, he started his courses of private lectures on the subject, in which he announced his own classification of anatomical lesions. He dealt with the work of Bayle, with whom he had worked at both La Charité and l'Ecole Pratique de Paris on the problem of tubercles.

At La Charité every patient who died was subjected to a *post-mortem* examination as a matter of course. All Laennec's predecessors had regarded the tubercle as one of the forms of consumption, and had seen it as exclusively pulmonary in form; but it was left to Laennec to correct Bayle's interpretation of the true facts and to define the true place of the tubercle and identify the various aspects or phases of pulmonary consumption. He showed that tubercles could be found in many other organs apart from the lungs, even in the bones. In November, 1803, while conducting an autopsy, he cut his finger while sawing through a tuberculous vertebra. He observed that the resulting swelling disappeared fairly quickly. This was not an isolated incident, but one which occurred some 7 or 8 times during his anatomical researches.

Invention of the Stethoscope

Over the next 10 years Laennec developed a special interest in chest diseases, and in 1816 he was appointed as Physician to the Necker Hospital.

In the same year the historic consultation with the stout, female patient took place, which led to the idea that by making use of some solid body, or medium, he might be better able to hear her heart sounds. His stethoscope quickly evolved from primitive, tightly rolled sheets of paper to a wooden model which was destined to go through innumerable variations of form and material right up to the end of the 19th century.

It has been written that if Laennec had done nothing more than invent the stethoscope, his fame would have been assured; but far more important was the way in which he was to use it and exploit it.

He started to investigate chest diseases by means of his newly found tool, and was able to describe or delineate most of them with far greater precision and clarity than anyone had ever been able to do before. In fact, by means of his stethoscope, and the use to which he put it, he was able to open up a new world of clinical medicine.

'De l'Auscultation Médiate'

By 1819 he was ready to publish the first edition of his 'De l'Auscultation Médiate, etc'. Although there were some who scoffed at his instrument, or seriously doubted whether it would ever really 'catch on', most discerning reviewers were quick to realise that the book not only introduced into medicine a diagnostic tool of great potential, the first it had ever had, but in addition it gave the most complete, accurate and clear account of chest diseases. Already, by 1825, one of Laennec's reviewers was referring to 'Laennec's immortal work'. Since then, generations of medical historians and medical men have hailed it as one of the great classics of medical literature, and the corner-stone of the modern understanding of chest diseases.

The book was translated (or rather rendered) into English by John (later Sir John) Forbes, who was then working at the Penzance Dispensary in Cornwall, in 1821. Forbes had heard

of Laennec's work through his friend Sir James Clark, who had visited Laennec at the Necker, and who in his private practice at Rome, which incidently included many consumptive patients, had been one of the first to adopt the use of the stethoscope.

Forbes undoubtedly took many liberties with Laennec's original work, and not only abridged certain parts, condensed others, and omitted some of the case-histories; but also drastically re-arranged the whole book, reducing it to about half its original length. Although he has been criticised for the way in which he rendered certain terms used to describe some breath sounds, he genuinely believed, as did most of his contemporaries, that he had actually improved upon Laennec's original arrangement and had made it more acceptable to English readers. He tried to restore it to what he thought it should have been: two independent treatises, one on pathology, the other on diagnosis. It was perhaps inevitable that Laennec's own first edition should have turned out the way it did, as he was naturally eager to emphasize the role of the stethoscope.

Forbes seriously under-estimated the role and influence the stethoscope was destined to have on medicine, but in the second edition of his translation he freely admitted that he had been wrong in this. If he had doubts as to the ultimate role of the stethoscope, he clearly had no doubts as to the great importance of Laennec's book, and the 4 editions of his translation which he brought out between 1821 and 1834 were hailed with enthusiasm by most contemporary reviewers. In retrospect we can see that his championing of the stethoscope and the teachings of Laennec, manifested through his successive translations, was of the very greatest importance.

In Laennec's first French edition, his account of tubercles appears in Volume 1, 1st Part, Chapter 2, Article 1, and occupies 40 pages. It was based upon his study of 200 patients, many of whom had been followed to the *post-mortem* room. In the Second Part he described the auscultatory signs by which the presence of tubercles in the lungs might be recognised.

Forbes re-arranged all this, and the first edition of his English translation began with his: 'Part First. Pathology. Book First. Of the Lungs'. The first chapter of this was entitled, 'Phthisis Pulmonalis', and occupied 44 pages. Section First, was titled 'Of the essential, or anatomical, character of Tubercles in the Lung'. As is the case with almost everything Laennec ever wrote, his views were expressed with the utmost clarity and precision. He began:

> *The existence, in the lungs, of those peculiar productions to which the name of Tubercles has been restricted by modern anatomists, is the cause, and constitutes the true anatomical character, of Consumption. (p. 1).*

Laennec then went on to describe the appearances of tubercles, tracing them from their first, observable state, in which he wrote they vary from the size of a millet seed to that of a hemp seed, and may be called Miliary tubercles—to the ultimate fibro-cavernous destruction of lung substance. Later on he wrote:

> *'There is perhaps no organ free from the attack of tubercles, and wherein we do not, occasionally discover them in our examination of phthisical subjects. The following are the parts in which I have met with these degenerations, and I enumerate them in the order of their frequency: the bronchial, the mediastinal, the cervical, and the mesenteric glands; the other glands throughout the body; the liver—in which they attain large size, but come rarely to maturation; the prostate—in which they are often found completely softened, and leave, after their evacuation by the urethra, cavities of different sizes; the surface of the peritonaeum and pleura, in which situations they are found small and very numerous, . . . the epididymis, the vasa deferentia, the testicle, spleen, heart, uterus, the brain and cerebellum, the bodies of the cranial bones, the substance of the vertebra or the point of union between these and the ligaments, the ribs, and lastly, tumours of the*

kind usually denominated scirrus or cancer, in which the tuberculous matter is either intimately combined with, or separated in distinct patches from, the other kinds of morbid degeneration existing in them.' (p. 11).

Second Edition of De l'Auscultation Médiate

In his first edition of 1819 Laennec had employed the analytical method, describing the different signs which could be elicited by percussion and auscultation and correlating these with the anatomical lesions. His approach to the second edition of 1826 was entirely different, and we know from his own words that he conceived of it as being an entirely new work, rather than a mere revision. Here, his material is treated synthetically, each disease being described in detail in respect of diagnosis, pathology and treatment. Nothing like it had ever been published before, and generations of physicians have commented on the modernity of the work.

By this time he had become famous, and in addition to his appointment as Physician to La Charité, he was Professor and Royal Lecturer at the Collège de France; his private patients included the Duchesse de Berri, and Cardinal Fesch, the uncle of Napoleon.

In the second edition of 1826 he elaborated on his views expressed in his first edition of 1819, and Volume 1, Section Three 'Des productions accidentelles developeés dans le poumon', contained his important chapter 'des tubercules du poumon ou de la phthisie pulmonaire'.

By 1824, Laennec's own first edition was out of print, as also was Forbes's first edition of his English translation of 1821. In fact, the latter had sold unprecedently well, all 500 copies having been exhausted by December, 1823.

When Forbes brought out the second edition of his English translation in 1827, he wrote in his preface that he regarded it as complete. However, he still abridged some of the case-histories, and in his own words, 'condensed, rather than abridged' the whole work. But as one contemporary reviewer remarked, *'The merits of the work of M. Laennec are neither to be understood nor appreciated by a review. The conscientious student will be satisfied with nothing short of a diligent perusal of the work; and even the most experienced pathologist will not disdain to consult a book in which he finds information so original, so copious so accurate, and so well arranged'.*

Laennec on Treatment of Tuberculosis

Laennec's ideas on the curability of tuberculosis are of interest, and Dr Keers has written: 'Amongst the many services bestowed upon the world by Laennec should be counted the restoration of hope and confidence to the tuberculous patient, which he expressed thus: "We are still entitled to hope for a cure of many cases of phthisis, or at least, for such a suspension of their symptoms as may be deemed almost equal to a cure".'

With regards to the curability of phthisis, something doubted by many of his predecessors, and indeed, by many of those who came after him, Laennec wrote: *'To many practical physicians, who are not anatomists, the possibility of a cure taking place after the formation of an ulcerous excavation in the lungs, may appear quite inadmissable. . . . It is now, however, the general opinion of all those who are acquainted with the actual state of our knowledge respecting the pathology of diseases, that the tubercular affection, like cancer, is absolutely incurable, in as much as nature's efforts towards a cure are injurious, and those of art are useless. Bayle, in particular, advocates the possibility of its being almost indefinitely prolonged. . . . Crude tubercles tend essentially to increase in size and to become soft. Nature and art may retard or even arrest their progress, but neither can reverse it. But while I admit*

the incurability of consumption in the early stages, I am convinced, from a number of facts, that, in some cases, the disease is curable in the latter stages, that is, after the softening of the tubercles and the formation of an ulcerous cavitation'.

Laennec then proceeds to discuss some of the many measures proposed in the past for the cure of phthisis, such as blood-letting, the use of leeches, the actual cautury, and moxas. He also discusses the many 'empirical means' in use in his day, such as mercurial salivation, emetics frequently repeated, or continued for a long time in doses sufficient to excite nausea; acorns, charcoal, different kinds of mushrooms, red cabbage, the conserve of roses in large doses, crabs, oysters, frogs, vipers, chocolate, wine and spirits, sudorifics, electricity, millipedes, opium, wolfsbane, cinchona, preparations of lead, hydrocyanic acid, and the use of the swing.

It cannot, of course, be claimed that much of this has anything of a modern air about it; some of the so-called remedies mentioned above had been in use since the days of classical antiquity, and for most of them quite extraordinary claims had been made at various times in the past. If one examines this section of Laennec's work in detail one finds that, unlike so many of his predecessors and contemporaries, he makes no great claims for any particular drug or regimen. As is usual in all his writings, he speaks from direct experience: *Of all the measures hitherto recommended for the cure of phthisis, none has been followed more frequently by the suspension of or complete cessation of the disease, than change of climate.* And he goes on to say: *'Indeed, I am convinced, that in the actual state of our knowledge, we have no better means to oppose to this disease, than a sea-voyage, and a residence on the sea-coast, in a mild climate; and accordingly I always recommend these when practicable'.*

He also recounts his attempts to establish what he termed an 'artificial atmosphere', by means of sea-weed, placed under the beds of some consumptive patients who came under his care at La Salpetrière Hospital at Paris. *'Twelve . . . patients were subjected to this treatment for four months. In all of them, the disease remained stationary; and in some, the emaciation and hectic fever were sensibly lessened. Nine of them, considering themselves cured, left the hospital, although I must admit that only one of these affords any real hope of cure'.*

Unfortunately, the supply of fresh sea-weed ran out, and Laennec writes: *'the disease, from this time, assumed a rapid progress in the three remaining patients and speedily carried them to the grave'.*

Although Forbes, in one of his footnotes, referred, in the somewhat frank manner of the times, to the 'imbecility of this statement', Laennec made no great claims for sea-weed, but merely recounted his experiences with it.

Some of Laennec's critics, both French and foreign, regarded his therapeutics as being the weak part of his teachings, but Laennec never embraced any system, either of medicine, pathology, or therapeutics. He was content to describe what he had actually seen, and any conclusions he drew were based upon his own experience. If he followed any system at all, it can be said that his approach to medicine was Hippocratic; although to the spirit of observation which had justly made the Hippocratic Corpus famous, he added, of course, material and information gleaned from his own detailed pathological observations. Very little about treatment appeared in his first edition, but as we have seen, his second edition contained a full account of the subject.

One has to remember that all his clinical observations were made with his own keen senses, heightened by the way in which he exploited the use of his great invention, the stethoscope. His pathological observations were based in the main upon the use of the naked eye, although he sometimes made use of a magnifying glass, but no effective microscopes were available at the time.

Laennec's influence

His influence was very great, and although his followers or disciples never founded a school, or sect, as his great adversary Broussais did, we know from the preface to his second edition that over 300 young medical men, physicians, surgeons, or students, mostly what we would now call post-graduates, had attended his formal lectures at the Collège de France, his ward-rounds at La Charité, and his pathological demonstrations. Most of all, they had had the opportunity to learn the art of the stethoscope under the eyes of the master himself.

Although the work of Villemin, the identification of the tubercle bacillus and the discovery of modern chemotherapeutic drugs all lay in the future, Laennec's work can be said to have changed the whole picture of tuberculosis, just as it had changed the whole approach to chest diseases in general. After the publication of his truly immortal work, a book which has been published in more than 30 editions in various languages, the study of tuberculosis was never to be quite the same again.

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