

The Life and Work of

THOMAS LAYCOCK

1812-1876

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ABSTRACT

Following an introduction giving the reasons for writing on Thomas Laycock, there are two chapters of personal biography making use of his unpublished personal Journal.

An account is then given of his papers on hysteria and the thinking which led from hysteria to reflex brain function.

Next a chapter is devoted to Laycock's writings on public health and his involvement with Edwin Chadwick in the preparation for the City of York of The Report on the state of Large Towns and Populous Districts.

Laycock always had a special interest in medical psychology and extended reflex action to explain some of the phenomena of mental illness and memory. An account is also given of his various other writings related to psychiatry.

He was aware that extending reflex function to the brain would result in various philosophical and theological problems and Laycock's opinions are given on these issues together with a brief account of his classical work Mind and Brain.

Having a great interest in medical psychology, also being a lecturer at the York Medical School and later Professor of the Practice of Physic at Edinburgh, it was natural he should be a pioneer in the teaching of the subject.

Many fascinating ideas are to be found in Laycock's writings on general medicine, especially his use of neurology to explain oedema and certain types of pulmonary disease. A trophic nervous system was thought to cause tissue pathology which was a reversion to a lower evolutionary type.

In his last decade Laycock wrote consolidating many of his previous ideas but attempted to bring these into line with then current scientific advances. A selection of his unpublished writings is examined in the same chapter.

In his lifetime Laycock was not an influential person but he impressed a few of his more able students, several of whom were to become professionally distinguished. The careers of these are described.

After some conclusions a bibliography, with notes. is provided of published and unpublished works used in this thesis.

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

This is a biographical study of Thomas Laycock, physician, and examines his life and writings in the changing medical and social scene of the mid-nineteenth century.

Reasons for writing on Laycock

As a doctor he had an extraordinary career. Starting life as an apprentice in a small Yorkshire town, he rose, without wealth or patronage, to be Professor of Medicine in the University of Edinburgh.

At the time Edinburgh was the premier clinical teaching school in the United Kingdom and Laycock's rise was a typical Samuel Smiles self help story, a story well worth telling in its own right.

There can be few medical men of the period who wrote and contributed to such diverse fields of medical endeavour. Although not a topic for which he is widely known, Laycock was very active in the early days of public health, the City of York especially benefiting from his work. It was an issue on which he wrote and co-operated with that legendary figure of public health, Edwin Chadwick. Intimately related to public health is statistics and it was therefore appropriate that Laycock should publish on that subject and, at one time, be secretary of the Statistical Section of the British Association for the Advancement of Science. For Laycock public health embraced many matters of medical administration such as the registration of all medical practitioners and coroners' Courts.

The single most important work for which Thomas Laycock is remembered is the extension of reflex action from the spinal cord to the cerebral hemispheres, thereby initiating the movement of medical psychology. Beveridge (1) writes:

Laycock was the first to argue that a science of mental life was possible, that mind could be studied using the principles of medical psychology....he sought to develop a scientific cerebral psychology which would unite philosophy and physiology.

It is this which has led in recent years to a revival of interest in Laycock by those authors dealing with nineteenth century neurophysiological concepts (2 and 3).

The development of reflex brain function and unconscious cerebration had profound implications for philosophy and theology; implications which were not neglected by Laycock, for many of his writings relate to these matters. Controversies about the nature of the will, consciousness and the precise relationship between body, mind and spirit were to continue throughout Laycock's life, matters to which he gave considerable thought.

Reflex brain function was used to explain many obscure phenomena, hysteria, mesmerism, somnambulism, dreaming and much of psychiatry especially hallucinations. Insanity was a subject in which Laycock had a special interest, not only in its theory and practice but in its teaching. He was well acquainted with the asylum situation, he promoted the interests of asylum medical officers, was an early member of the Medico-Psychological Association and eventually its President. As a lecturer at the York Medical School and then as Professor of Medicine at Edinburgh Laycock was a pioneer in psychiatric teaching to medical students. This was not confined to lectures but integrated with asylum experience, neuro-anatomy and physiology and pathology. Although convinced that the brain was the organ of mind, environmental aspects of mental health were not neglected; alcoholism was of special concern.

The nineteenth century posed many problems for the church when many were teaching dynamic relationships in biology and anatomy which undermined age old views of God and Man (4). Physiological development challenged vitalism, and anatomy and

physiology of the nervous system had implications for mind and behaviour. New techniques were rapidly being developed in magnetism, electricity, chemistry and geology, all of which influenced biology and the way the world was viewed. Thomas Laycock, like many of his contemporaries had been brought up in the Christian faith which he did not entirely wish to forsake. An important part of Laycock's work and thinking was not only to unite physiology and psychology, but to reconcile them with a theological belief. The way he did this in his personal religion will be described.

In addition to reflex function of the brain, Laycock developed other ideas involving the nervous system, how neurological abnormalities resulted in tissue pathology and disease. These concepts, little known in the history of medicine, will be examined together with other of his writings in general medicine. A glance will also be taken at Laycock as a clinician and as a medical teacher.

Although Laycock is not generally regarded as an influential figure, he did impress a small number of his pupils and juniors, many of whom became famous and continued some of his ideas. The lives of these men will be described.

No overall biography of Laycock has been written and perhaps this is a valid reason for this attempt.

Finally a tentative attempt will be made to show that neuropsychology is of immense importance to us today and that Laycock was an early pioneer in developing that subject.

Structure of thesis

In general a chronological sequence will be followed, but some flexibility allowed to gather subjects under appropriate headings. Because Laycock was such a prolific writer, some three hundred publications, and because there is such a wealth of unpublished manuscript material, some selection has been necessary. However as many aspects of Laycock's life and work as possible have been considered, although many single subjects have been inadequately treated.

No man exists in isolation and Laycock was himself influenced by previous workers and by his contemporaries. The views of some of these will be noted together with reviewers of his works. Two valuable sources of opinions of Laycock are given by his colleagues, his testimonials submitted when applying for the Chair of Medicine at Edinburgh and the obituary notices at his death. These will be briefly examined.

In spite of his difficult literary style which placed him at a disadvantage with many contemporaries, Laycock was a man of great intellectual ability whose life and work are worthy of further study; it is likely the significance of his writings and ability as a teacher have been underestimated.

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CHAPTER 1

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CHAPTER 2

BIOGRAPHY

EARLIER YEARS

The biography of Thomas Laycock broadly falls into two parts, his school days, medical training and practice in York, and secondly, from 1854 covering his appointment to, and life as the professor of the practice of physic at Edinburgh. His school days, life as an apprentice and as a medical student set his moral and religious beliefs, and his early years in practice established his concern with social and professional matters.

Family Background and Schooldays

The year of 1812 is usually remembered as the year of Napoleon's retreat from Moscow and the beginning of the American War of 1812 while at home it was a hard time with poverty for many and great political unrest (1). It was also the year of Thomas Laycock's birth at Wetherby. His father, Rev. Thomas Laycock was a Wesleyan minister who was born at Keithley and entered the ministry in 1796. It was no coincidence that a Wesleyan minister should at that date come from Keithley as regular Wesleyan meetings were held there from 1744; further in 1779 a John Laycock, probably the grandfather of Dr.Laycock was a trustee of Wesleyan properties in Keithley.(2). At that time it was the practice for ministers not to remain in one place for more than two years, the Rev.Thomas having had ten stations before going to

Wetherby where the future Dr. Thomas Laycock was born on August 10th 1812. Almost immediately after the birth of the younger Thomas, the family moved to Ripon, in 1814 to Patrington, 1815 to Gainsbrough, 1817 to Addingham, 1819 to Todmorden and 1821, the year Laycock started school, to Holmf^{ir}th. This must have been a difficult time for Laycock's mother and during this period two more children were born. Five more postings followed before the Rev Thomas died on the 8th June 1833 at Doncaster where his widow remained for some time after his death (3). Laycock's mother was the daughter of a Cheshire squire named Cattle. A letter by Emma, a niece of Dr. Laycock and dated May 1937 reads

I'm sorry I cannot give him (my son) any satisfactory information about your father's grandfather. All I have heard about him was he was a country squire. owning large estates, fond of hunting and having dinner parties in the old style where wine and spirits were abundant and the butler would find gentlemen asleep under the table! The result of this generosity to his friends and himself was that he was obliged to part with most of his property. I think his name was Cattle and his estate was in Sealand, Cheshire. His daughter married a Wesleyan clergyman named Laycock. It was surprising the daughter of such a gay father became a Wesleyan. They had eight children of which only two survived. (4).

These two surviving children were the mother of Thomas Laycock and her brother Robert Cattle, Laycock's uncle.

The early nineteenth century was a time of change in education, from school riots and the flogging heads to the great reforming headmasters, Samuel Butler, Thomas Arnold, Edward Thring and others. It was also the period when new Anglican schools were being founded and Non-conformist schools established with a more liberal syllabus.(5). Because of frequent changes of ministry for Wesleyan clergy and consequent places of abode for parents, the provision of free boarding school facilities

for sons of ministers was necessary. This prevented disruption of schooling and children having continually to make and break friendships.

Woodhouse Grove School to which the future Dr Laycock went was the second Wesleyan school founded and was opened in 1812 to cater for the sons of ministers in the north of the country. For five or six years the school would be the boy's home and his life. Apart from a period of up to four weeks about May when a boy could return home there were no holidays, although school routine was suspended on Christmas day and Good Friday. Saturday was a half day and in the afternoon pocket money was distributed, 1½d supplied by the school and usually another 1d by the parents but ½d had to be donated to overseas missionary funds leaving the boy with 2d, although some of this may have been deducted for fines for misbehaviour. Opportunity of spending pocket money was limited to the spice man who had to stand at the gate with his basket while two or three boys at a time were escorted by a master to make their purchases.

Living conditions were spartan; after a night in narrow slatted beds boys had to rise at 5.45 am or 6 am. and after being ordered to kneel for a few minutes they were marched to the toilets to wash and then on to breakfast. The last meal of the day was at 5.30 p.m., dry bread and water, and no boy was allowed anything to drink then until breakfast and no talking was allowed at mealtimes. For the most part the boys were confined to the school or a small play area, and boys caught out of bounds were always severely punished. The chief game was fives or racquets played against an old bakehouse wall until a fives court was built late in the nineteenth century. Various punishments were given for misbehaviour including corporal punishment and sometimes expulsion from the school. Sundays must have been a welcome change, as in addition to Sunday School boys were escorted to a local chapel when they had the advantage of seeing something of the outside world. During the whole of Thomas Laycock's period at the school (1821-1827) the headmaster was Samuel Parker who proved himself a very competent head after a period of instability at the school. He is described "as a large man at least six feet tall and weighing seventeen stones; an intimidating sight to small

boys-----, a scholar quickly moved to emotion, a first rate teacher of boys who were prepared to learn and to keep pace with his own mental ability".(6)

Parker (Tommy to the boys) was an enthusiastic Methodist so that the religious and moral aspects of school life would not have been neglected. He also introduced many new subjects including science which he taught himself; at times there were explosions or very unpleasant smells when boys and master retreated laughing from the laboratory. It was probably a pleasant session for small boys! A time table of 1829, (and it was probably much the same in Laycock's time) included French, Geography, account keeping and philosophy as well as the usual Latin and Greek. The first lessons started at 7 a.m. and finished at 8 p.m. with a two hour break from noon to 2 p.m. and supper break 5-6.30 p.m.; several sessions were devoted to writing and exercises which would have given Laycock ample training in essay writing. An interesting aspect of school life at this period was that standards were monitored by external examiners who gave each boy a viva. In 1823 the examiner was the Rev. Patrick Bronte B.A. vicar of Howarth. It may have been the teaching of science which interested Laycock in medicine as a career. Another boy, John Draper, a contemporary (1822-1824) on leaving school emigrated to America, qualified in medicine and became a well known scientist and historian. He was also a pioneer in photography and improved Daguerre's method.

An early list of pupils shows a James Laycock who entered the school in 1817 and became a Wesleyan minister and a Robert Laycock who entered in 1825; these were brothers of Thomas Laycock. Another Thomas Laycock entered in 1848 and may have been a nephew of Thomas Laycock. (7). The same record notes that while Dr. Thomas Laycock attended school he was with a group of boys bathing in the river Aire when he was carried off by a large volume of flood water being suddenly allowed to enter the river, but fortunately he was saved by some of his school fellows. Thomas Laycock was probably a lonely boy at school who experienced difficulty in making relationships but was fortunate in having his brother James already at the school when he entered and who possibly looked after his younger brother. Later Thomas was to write ".....James, a faithful kind monitor, thoughtful and affectionate etc. as a brother

or to sum up all in one emphatic word my only friend" (8). His family background and early life would be such as to lead to his disciplined character with decided moral values and his education which, including classics, philosophy, essay writing and science would result in his interests and style of writing in later life.

Laycock had a good relationship with his family in spite of rarely being at home after starting school. His mother wrote to him in London in April 1834 informing him of the words she had put on his father's grave stone:

Rev.T.Laycock who for 36 years diligently and faithfully discharged the duties of a minister of Jesus Christ in the Wesleyan Methodist connection. He closed a laborious and useful life June 8th 1833 in the 64th year of his age.

Laycock commented

Father was consistent, was laborious and was useful. What a providence blessed me with such a father. Mean in the eye of the world, lame, little, deformed and benevolent, gentle, loving, forgiving - what parent could equal him - none except my mother, she knew how to manage him, she knew him. And how assiduously unweariedly, intelligently did she attend him during a long and trying illness. Nay the whole family has, more or less, a portion of the virtues of our dear parents. (9).

Profession and Professional Training

The choice of a career for Thomas was rather limited especially as his older brother James was entering the Wesleyan ministry and in addition to Thomas's own interests the following would have been considerations. Entrance to the Army or Navy would have meant the purchase of a commission and there was no such family or school

tradition in that direction. The calling of the surgeon apothecary was becoming a respected one; one which offered the chance of earning a living and this would certainly have been required in the case of Thomas Laycock. The Wesleyan Church may well have been inclined to sponsor boys for whom it had a responsibility in that direction; John Wesley had recognised the shortage of medical men and to help the situation had himself written a book on medicine, Primitive Physic, in 1747 which went through some thirtytwo editions.(10) Except for graduates of Oxford and Cambridge, who had no supervised clinical training, apprenticeship was the usual mode of entry to the medical profession in the early years of the nineteenth century. The situation in England and Wales was exceptional in that London drew the vast majority of medical students, for unlike Scottish and Continental towns there were no universities with hospitals for teaching. The Royal College of Surgeons and the Society of Apothecaries both recognised apprenticeship and conducted their own qualifying examinations, joint qualifications M.R.C.S. and L.S.A. becoming the accepted ones for general practice. Since the beginning of the nineteenth century moves had been afoot for legislation to restrict the vast number of irregular practitioners, those without any qualifications or recognised training. These moves eventually led to the Apothecaries Act of 1815, which stirred both surgeons and apothecaries to tighten requirements in order to sit for their qualifying examinations. The Royal College of Surgeons made several changes to their regulations; in 1834 those of 1829 would have applied; these required in addition to apprenticeship one year at a provincial hospital or six months at a London hospital. The Apothecaries Act (which applied to all who dispensed physicians' prescriptions) required attendance at two courses in medicine, two in anatomy and two in anatomy and physiology. The effect of the surgeon's regulations was to draw candidates to London while those of the Apothecaries stimulated teaching in provincial centres.(11) Such were the regulations Laycock would have to meet.

Apprenticeship at Bedale

This process was reflected in the training of Thomas Laycock who, at the age of fifteen was apprenticed to William Spence and his son John Spence, surgeon-apothecaries of Bedale, a small Yorkshire town.(12) The change from school life to that of an apprentice must have been a tremendous one yet it was made quite successfully. John Spence was a well qualified man; he was born in Bedale, educated at the Manchester Grammar School and after his apprenticeship to his father attended the dispensary at Ripon before travelling to London to attend St. George's Hospital. He qualified L.S.A. in 1825, M.R.C.S. 1828 and L.R.C.S.(Ed.) in 1828 and was thus continuing his studies and gaining qualifications after Laycock started his apprenticeship which is dated from 16th August 1827, a situation that may well have helped in the instruction of the young apprentice. John Spence continued to study becoming an L.R.C.P. (Ed.) in 1860 and F.R.C.S. (Eng.) 1861 by election.(13) He started to practise in Manchester but later returned to Bedale. William Spence retired to Manchester but John Spence's name appears in the Medical Register until 1878, indicating he outlived the young apprentice Thomas Laycock.

Hird's Annals of Bedale (14) gives a curious history written in the form of poetry and extending to the year 1841. The population in 1821 was 1,137 in 214 houses. Although there are several references to the Spences it is difficult to trace an exact chronological order of events. In 1841 there were "three doctors shops, Mr. Bowes who built Glaister's house; Mr Fothergill who died in the Akstone's house and Mr. James Hutchinson who rebuilt Mr John Spence's house". There were also two druggist shops so that there were a number endeavouring to make a living in medicine in a small market town and its surrounding neighbourhood. This ratio of three or four qualified people to two unqualified is consistent with the findings of Marland (15) for the towns of Wakefield and Huddersfield where in 1837 there was one unqualified person to 1.5 and 1.9 qualified medical practitioners respectively. It is probable that Mr. John Spence had a satisfactory practice, and in 1839 he was presented with a silver star and green ribbon

as President of the Ancient Order of Foresters. Bedale had a strong Methodist tradition and it is possible this was a factor in the Methodist Church selecting Bedale for Laycock's apprenticeship, although both William and John Spence are buried in the Parish Church graveyard. In his apprenticeship period Laycock lived as one of the family and did not sleep under the counter or in a garret as is sometimes thought of as being the lot of an apprentice. In all probability living in a family was a very welcome change from the school life he had known so long. Memories of the Spences returned from time to time and on the 17th November 1833 Laycock recorded that he was passing through Russell Square when he heard the tune "Sunflower" being played on a barrel organ and he recalled

I remember how often I had sung the verses with Mary I
remembered how often I had heard the good natured old Mr.S(pence)
call upon Mary 'Come Mary my lass, let's have the Sunflower

As he went by Laycock heard another passer-by use surly expressions towards the old withered organ grinder to whom Laycock gave a penny for which the old man heartily thanked him. Laycock commented

it was a penny well spent. No cordial could have been as agreeable as the remembrance of early friends when all was gay and smiling.(16).

Doubtless many menial tasks had to be undertaken, such as washing instruments and bottles but Laycock would have learned the techniques of bleeding, cupping, giving enemas/catheter passing, wound dressing and bone setting. He also had experience as a horseman, as many outlying villages and farms had to be visited, the roads or tracks being muddy and in poor condition. Unfortunately little is known of this period in Laycock's life but when commencing his London studies (September 1833) Laycock started his journal in which he referred to members of Mr. Spence's household and a subsequent visit there. Laycock had a special relationship with Mary Spence and expected marriage, although at times he wondered if it had been a true love. On February 28th. 1834 he received a letter from Mrs.O. of R. saying:

You will perhaps have heard of M----- S---- marriage which has to

take place next month to Mr. Prest of Masham.

Laycock wrote

Is this true ? What M. marry that unprincipled fellow, a man reckless of all consequences, no God, no heaven, no religion? A man who has boasted of his conquests over the opposite sex?---- I did not fail to warn M. of the insidious ways of that man.---- -I loved her well - she knew I loved her well---- · she promised to wait one year, and this was at parting with me.(17)

Laycock then went on to recall that Mary wrote her name in his copy of Manual of Pathology (18) to remind him of her when he was in London, but he consoled himself that she would have been a worse than useless partner. Nevertheless his thoughts returned to M. from time to time.(19). Masham was only five or six miles south of Bedale, would have been in the area served by the Spences, and several entries in Hird's Annals refer to various members of the Prest family. Laycock continued to correspond with his old master whom he visited in 1835 and when Laycock applied for the chair of of the Practice of Physic at Edinburgh in 1855, Mr.John Spence wrote a testimonial saying:

Having heard that you are a candidate for the Professor's chair of Physic now vacant in the University of Edinburgh, I feel extreme pleasure in conveying to you my congratulations and sincere good wishes for your success.

I have often dwelt with pride upon your zeal and indefatigable application to the study of your Profession when a pupil of mine and felt confident that your aspirings would in future life secure for you (if spared) as they already have done, a wide celebrity. Passing over the honourable and extensive curriculum of your studies, the value and extent of your literary works have secured for you undying fame, attesting

as they do the Herculean character of your mind. The enviable position to which as a candidate you aspire, would be the more valuable to you and the Profession by giving scope to the exercise of those rare qualifications by which as a Lecturer on Medicine you have for a length of time been distinguished, and employing still more extensively those invaluable qualities, which as a Consulting Physician you have long been held, and which have gained for you the confidence not only of myself but of a wide connection of medical as well as private friends (20).

The London Visit and Examinations

Thomas Laycock moved to London after having spent all his life within a small area of North Yorkshire. When twenty one years of age, in the year 1833, he arrived to study medicine and surgery at the newly founded University College. The journey was described in his Journal as being made in a high flyer coach, part of the time being spent inside and part outside. His fare was paid by his uncle Robert Cattle and Laycock noted he had £48 in his pocket but he did not reveal its source (21).

The change from Bedale to London must have been very great. In addition to the great buildings such as the Tower of London and Royal Palaces, there were a number of private houses of an imposing nature. Socially, financially and commercially London was the hub of the Kingdom, nevertheless outside the City there were disgraceful slums, to the East at Stepney and Bethnal Green and the West the King's Cross and St.Pancras districts. Paving, street cleaning, street lighting and sanitation were in a primitive condition. In addition to the great churches, Westminster Abbey and St.Paul's, there were numerous churches and chapels of various denominations; religion was very much a power in national life. Theatres were popular and there were secular institutions such as the Royal Academy and the Royal Institution (22).

Laycock lodged at 49 London Road and the first morning he awoke feeling very depressed and alone, knowing only one person in a city of one and a half million (23), but he soon made other acquaintances, joined in University life and visited various attractions. At the time University College Hospital had not been established and under flexible arrangements students could attend other London hospitals. In the first half of the nineteenth century there were still private medical schools in London but whether Laycock attended any of these is unknown; his certificates for the Society of Apothecaries recorded he attended for fourteen months at the Westminster General Dispensary. (24).

Thomas Laycock recorded his assessment of introductory lectures at University College. The professor of medicine, Anthony Todd Thompson, is reported as a pompous conceited old man who gave his lectures as a set oration; a later lecture was so wearisome and unengaging as to repel attention and it was only with great difficulty Laycock could keep his mind on the subject. Towards the end of his first term, Laycock breakfasted with Thompson and acted the bashful man. The doctor was exceedingly affable, his two daughters very silent and Mrs Thompson very talkative. Laycock described his favourite countryside, Hamilton Hills, Richmond, Airedale and Swaledale, to them. (25). Elliotson was indistinct and almost inaudible, Dr Davis, the midwifery professor, was exceedingly minute in his explanations so that the merest tyro could understand him, Dr. Turner was an admirable lecturer and an excellent chemist while Professor Quain was second only to Turner. Samuel Cooper, professor of surgery hemmed and shuffled his feet, his voice faltering and his lecture written on both sides of the page so that he frequently confused the page and repeated sentences two or three times. He talked as if his tongue was too large for his mouth.(26).

An optional class that Laycock enjoyed was one conducted by Robert Grant in comparative anatomy. Grant, a medical graduate of Edinburgh, had a great influence on Charles Darwin when he was studying medicine at Edinburgh; Desmond and Moore have written "nothing was sacred for Grant. As a free thinker he saw no spiritual power behind nature's throne. The origin and evolution of life were due simply to physical and

chemical forces, all obeying natural laws" (27). In 1827 Grant was appointed to the chair of comparative anatomy at London University and continued to teach in the same manner in London.(28). Sitting on the same bench at Grant's lectures was one with whom Thomas Laycock was to remain in contact for the rest of his life, namely William B.Carpenter. Laycock considered himself to be Grant's favourite pupil (29). Arriving in London on his own caused Laycock at times to be depressed and homesick, but he quickly rallied with work; depression recurred from time to time but never for long. It might have been expected that being surrounded by medical radicals teaching evolution from a study of comparative anatomy would have come as a shock to one who had been brought up as Laycock had, but this does not appear to have been the case. It is very probable Laycock possessed a copy of Quain's Elements of Descriptive and Practical Anatomy.(1828).

It is also likely that John Spence acquired some knowledge of the new philosophical anatomy whilst at St.George's Hospital and would have discussed this with Laycock at Bedale.

Laycock certainly saw the horrific side of surgery and described one such event together with his own feelings

Nov 2nd (1833) saw Sir C. Bell and Mr Mayo at Middlesex hospital where I witnessed an amputation for the first time in a hospital.

There is something inexpressively touching in the groans of a man suffering mortal agony. The patient was a German who had caries

of the bones of the ankle for eleven months. The pain of amputation was endured with fortitude, he only uttered three or four unearthly groans when the amputation was half completed.

The theatre was crowded with students who expressed by their contorted countenances their sympathy with the poor sufferer of the operation. He was afterwards cheerful and thankful.

Mayo is butcher like and unfeeling in his appearance, but Sir Charles Bell on the contrary is mild and gentlemanly.(21)

A visit to the dissecting room at Guy's Hospital left Laycock horrified at the sight of half putrified livid naked corpses lying stretched on the dissecting room tables. The casts of various faces showing diseases were equally horrifying, many of them relating to syphilis, and Laycock could not account for the infatuation with which students rushed in to similar dangers. Prostitution was very common in London; the Lancet of 1857 carried two leading articles reviewing the subject and going back to 1729 (30). It was recorded that one house in sixty was a brothel and that one in sixteen females of all ages were prostitutes. There was thus an abundance of temptation for students but Laycock viewed the situation with horror. The facial casts were those being made by Joseph Towne, the modeller at the hospital and which can be seen in the Gordon Museum to this day. Of his own dissecting experience Laycock recorded he became acquainted with a fellow student Knevett who was 6ft. 2ins. in height but a great dunce. He did however have a set of bones which he was willing to lend; Knevett did not like the practical anatomy so Laycock did the dissecting while Knevett read the books and paid half of the expense, an arrangement Laycock said suited him well. In November Laycock was introduced to Dr Marshall Hall and commented he found him like other men "the more I know about such characters the less fearful I am of commencing the race for life in good and earnest. They are men of like passions, powers and dispositions as myself".(31)

The Journal for November 1833 describes a visit to the Church of Henry Irvine in Newman Street. Irvine, a well known preacher of his time, was associated with a cult of 'speaking in tongues', Laycock's account reads:

Have been to Irvine's church in Newman Street, Oxford Street and heard much of the talked of prophesyings..... At the further end of the chapel there is something like a singing gallery with steps extending across the whole extent of the ascent to it. The steps are covered with crimson.

After the ascent of 7 or 8 steps there is a sort of landing on which there is a sort of reading desk, a large armchair and on each

side of the last three or four smaller chairs all covered with crimson, the larger one being for Irvine and the lesser ones for the deacons amongst whom was Mr Perceval seated on Irvine's left..... Irvine is a dark looking man with grey whiskers, long coal black hair or a wig of a similar colour and a very sinister forbidding eye. His manner and delivery are exceeding impressive.

After he had expounded and prayed and the congregation had prayed the six deacons spoke successively for ten minutes. Amongst these was Mr Perceval. Mr.P has a gentlemanly appearance but a stern and commanding aspect. He spoke of trials and tribulations to come upon the earth but encouraged the Church with the text 'Fear not little flock it is your Father's good pleasure to give you the Kingdom'.

After each deacon had spoken one of the prophets began to cry out in a loud voice and a female was led out in hysterics. Laycock left in disgust while the congregation was singing (32). The Mr Perceval referred to must have been Mr Spencer Perceval, a son of the assassinated Chancellor of the Exchequer. His brother John Perceval who was also associated with Irvine was at that time detained at Ticehurst and later active with the Alleged Lunatics Friend Society (33). An account of John Perceval, his period of insanity and a record of his experience when he had recovered is given by R.Porter (34). Laycock's first Christmas Day in London was spent visiting St.Paul's and the Roman Catholic Chapel in Spanish Place. The latter he found impressive, the gorgeous priests at the altar and the delightful music.

At the beginning of his London stay Laycock was friendly with George Newport but later had some very bitter things to say about him. The Journal gives many interesting insights into Laycock's character. Newport and Laycock gradually drifted apart and at the end of January 1834 Laycock approached Newport at the gates of the University where there were mutual accusations of ungentlemanly conduct followed by some altercation. Newport started to cross the road when Laycock roared after him that

he was mean and ungentlemanly and they seemed to be on the brink of violence. Later that evening Laycock, in an introspective frame of mind wrote:

and Newport, that sneaking unmanly backbiting N. How could I like the man - perhaps well rid of him. But I am sure there is something wrong with me, I have so many enemies and so few friends. I am proud that's a dead certainty, and yet if I try to be humble I appear to cringe, I do it so awkwardly. I do believe there is some truth in phrenology. Holme told me that if I were a king I should be a tyrant, although the organ of benevolence he tells me I fortunately possess might modify the tyranny. Well I will try to be humble and courteous and all that - Oh Almighty and most gracious God! assist me! Amen. (35).

Newport was later to gain fame as an entomologist and a Civil List pension although there was a bitter dispute in which Marshall Hall, supported by Grant and William Baly who had also attended Grant's lectures accused Newport of plagiarism (36). An account of the episode which dated back to July 1832 appeared in the Lancet (37) and was contributed by Hall. Whilst in London Laycock paid his first ever visit to a theatre, on the 20th December 1833. He also visited the Royal Institution and was very impressed by Michael Faraday and seriously thought that he might himself work in the field of physics and chemistry. His scheme always dwelt on the combustion of hydrogen and oxygen, but it changed with time.

He first wrote

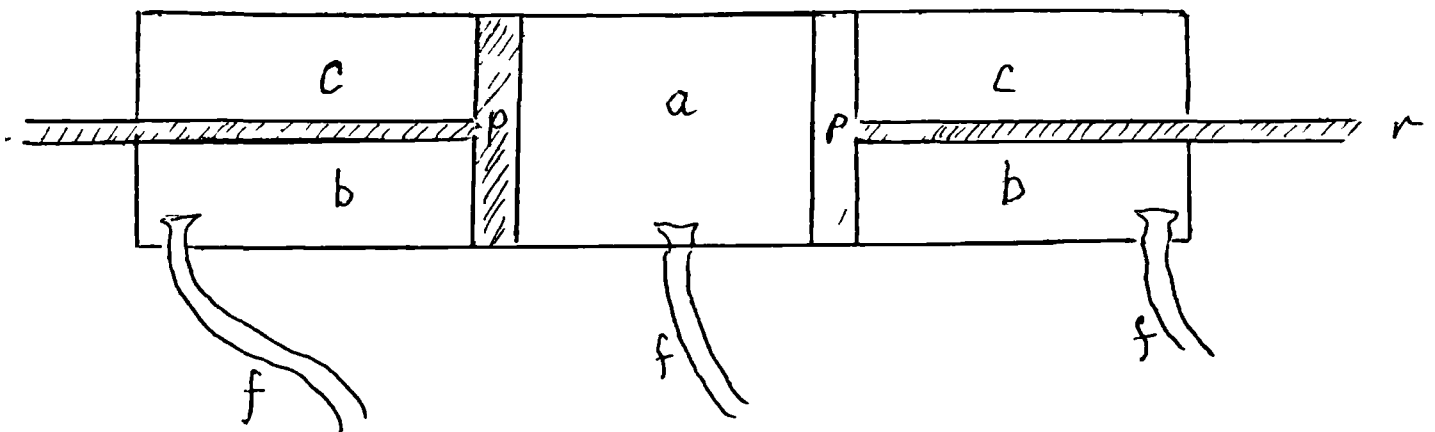
it seems more plausible however to use the power of the decomposition of water and burn the hydrogen and oxygen so obtained for the generation of steam: and intense heat might be kept up by passing a stream of these gases over some infusible ignited substance. The plates of the battery might be cleansed by raising the amount of seawater by means of the machinery of the steam engine and passed through a scraper. If the machinery was so

arranged to raise them once every ten or fifteen minutes, it would be enough. There would be no need for coal in this case and the want of this is the sole reason why there are not steamers plying across the Atlantic. The idea might be further extended to heating the smiths forges applied so as to prevent the gases coming in contact with the metal and to any part requiring intense heat. (38).

He then wrote to Faraday at the Royal Institution asking for various items of information such as the quantities of gas involved in the decomposition of water. It seems Laycock had witnessed the electrolysis of water and the subsequent explosion of hydrogen and oxygen.

A year later he wrote to the editor of The Times on his "galvanic scheme" but there is no evidence that he received a reply. Later whilst a resident at York County Hospital he returned to the subject, thought his idea had tangible form and designed a machine with two pistons at each end of a single cylinder, the pistons being moved by exploding oxygen and hydrogen.

A diagram of this apparatus was made in his Journal (39).



- a. Space between ends of piston
- b & c. Spaces between piston rods and cylinder
- p. piston ends.
- r. piston rods
- f. tubes for gases.

This was a schoolboy's diagram and not likely to command the attention of a serious engineer or scientist. There is no evidence that Laycock ever built such apparatus but it illustrates his approach to science, he was not afraid to jump in and speculate. He said of himself:

what I read must be licked into shape by my brain, hence whatever ideas occur in my reading are not new, I pass them rapidly, they are stored up already or rather incorporated with my stock of ideas.....I have power of generalising or assimilating my ideas. Thus I generalise from individuals to species etc. with great rapidity and consequently sometimes erroneously.

At the end of 1833 Laycock when considering the direction his career should take, wrote in December "I have fancied I could become the editor of a medical journal expressly for students" but Mr.Churchill, the publisher told him he did not encourage authors as most works were a losing speculation, however he did suggest Laycock should undertake translation work. His knowledge of French must have been good as in 1835 he saw an advertisement in The Times requiring a person capable of translating French into English with elegance and accuracy. An appointment in a coffee house was kept but unfortunately the Frenchman (de Tocqueville) who placed the advertisement seemed to prefer one of the half dozen others who were there.(40). Other literary efforts in the same year also ended in failure. A barrister, Mr.Foster, befriended Laycock and recommended him as a contributor on Heat, Anatomy and Physiology for The Penny Cyclopaedia but again nothing came of the literary attempt.

Like many of his generation Laycock visited France for professional studies in 1834. He spent a session in the Medical School of Paris studying medicine under Louis,

clinical surgery under Velpeau, uterine pathology under Lisfranc and practical midwifery and operative surgery under Halmagrand and Mance but gave no details of this visit.

On his return he wrote in his Journal

what good have I done during these twelve weeks which I have spent in France? Alas I know not any! I have spent time and money foolishly - true I have gained professional knowledge and am a little courted for my supposed respectability but for the general expenditure of my time and money why does conscience not whisper well done.

Laycock said this was because he had many whims and fancies and ideas and wishes to gratify which would remain ungratified if he changed his course of life.(41). Paris was a Mecca for medical students of the time, as were some other French towns where, in addition to teaching, valuable experience could be obtained. British students either went to Paris Hospitals and attached themselves personally to physicians or surgeons or they formally enrolled at the Faculté de Médecine de Paris. Central to the French teaching was the linking of clinical practice with pathology: clinicians, whether physicians or surgeons, expected students to follow them from lecture room to wards and from wards to the autopsy table (42). This experience of study in France was more than learning new methods but also the interaction of two cultures. American medical students also followed the trend of spending a period of study in Paris.(43).

Medical Students in Laycock's Time

Medical students of Laycock's time were not held in high regard; Bob Sawyer and Ben Allen in Dickens' Pickwick Papers with notorious drinking parties in lodgings for which bills were always in arrears may well have been above average in that there was no obscene language or immoral behaviour, as suggested by Laycock.

Laycock described a ward situation, possibly at Guy's Hospital, as he witnessed it and wrote

Disease was there in every shape from the victims of illicit pleasure, to the mewling infant labouring under diseases of its parents, the prostitute, the broken libertine, the unfortunate industrious, the deserted, the destitute all were there: I know not how to sufficiently express my abhorrence of the manner in which students rushed through the wards and crowded round the wretched patients, thrusting and elbowing and sometimes standing on the truckle of the sufferer: what a mockery of misery. (44).

This was probably due to students being allowed in the wards only at very limited times. The London hospital situation was evidently very different from the practice experienced in a country town or village; seeing the patients individually, even in squalid surroundings was very different from seeing them en masse. James Paget, who, like Laycock had been an apprentice and came to St. Bartholomew's for the final part of his training, was a contemporary of Laycock's and was later in life to write of medical students of the period;

As for the general body of the students of my time, I believe they were, in comparison with others of the same age and same level, about as they are now. I cannot venture to say whether they were a little better or a little worse than young lawyers or young men of business. As among other students, there were a few thoroughly vicious fellows who came to a bad end, left the school in disgrace, or were plucked and not heard of more; and some idle fools, and some blockheads and untaught, who could never learn their duty. These have been caricatured as if they were types of the whole class; it would be as reasonable to sketch the general characteristics of Englishmen from a slight

acquaintance with some inmates of a lunatic asylum. The majority of students then, as now, worked well; some were laborious, as with a natural pleasure in the exercise of mental power, or in emulation, or in consciousness of duty or of necessity, or with all these motives. Some of these are living still.... I doubt whether you could find better now.

There is a greater contrast in the play than in the work of that time and this. The pleasures and amusements then were coarser. There was much more drinking; a few were often drunk, and many who never were so would boast of drinking more than they thought they needed. Cursing and swearing were common in ordinary talk, frequent for emphasis, and nasty stories were very often told and deemed of the same worth as witty ones. Impurity of life and conversation were scarcely thought disgraceful or worth concealing. But in all these faults there were great differences among the students; some might boast of them, but many only tolerated them and kept as clear as they could; a few rebuked them, chiefly those who, in the slang of those days, were called Saints or Simeonites, after the great Cambridge preacher. But let me repeat, the students of that time were only living and talking after the ordinary manner of the day; the same faults, the same virtues, prevailed in all similar groups of men, just as now you who are temperate and pure and decent in your language are not rare examples of the men of these much better times in which you live. (45)

From his journal it can be seen that Laycock, like Paget, did not follow the general type of student conduct of the time; Laycock's journal records many visits to chapels or churches even if he did have his eyes on the young ladies with a possible view to matrimony. Many student's conduct was disapproved of by Laycock and he

avoided their company. On 10th October 1833 he attended divine service at King's College Chapel with another student Collyer.(46). They dined and rambled in the park down to Westminster Abbey but Laycock wrote "This day has not been spent properly, I have lost a day. Conscience again whispers accusation. I have formed too intimate acquaintance with Collyer which I must break; he has no principle, no anything, his conversation is abominably impure and miserably deficient in interest". Both Paget and Laycock belonged to a group who upgraded the practice of medicine intellectually, morally and socially. At a future date they probably became acquainted, since in 1855 Paget was to write supporting Laycock's application for the Edinburgh chair.(47)

Qualifications

Laycock described his examination for the College of Surgeons on 8th May 1835 when after some initial difficulty owing to his failure to have with him the necessary certificates, he was examined by Sir Benjamin Brodie who questioned him on the base of the brain, the orbit, the physiology of vision, ovarian dropsy and paracentesis. The examination did not finish until 10 p.m.! After paying twenty two pounds and five shillings, Laycock was a member of the Royal College of Surgeons.(48). There was no question of a London degree being taken since the M.B.examination of that University was first held in 1840 (49). In any case Laycock was opposed to the idea of a University Charter for London. In his journal for February 1835 there is a record of a student meeting supporting a University Charter but Laycock spoke against the motion giving as his reasons

1. A Charter would result in a monopoly to the prejudice of other schools.
2. It would destroy the healthy rivalry between schools.
3. It would not result in the advancement of science generally.

He did not expect a single supporter, but although his motion was heavily defeated he did have some support.(50). Another activity of Laycock was that of Chairman of the

Yorkshire Medical Students (seventeen in number). In February he wrote to the chairman of the College Council on behalf of the Yorkshire medical students at University College, about certain grievances they had relating to teaching arrangements. Anatomy specimens were put away before they had time to examine them and courses which started in the autumn were not officially recognised until the following January. Both complaints were rectified by the College authorities (51).

Having gained his M.R.C.S. Laycock said he laid aside his studies for a month or two and in May travelled north by steamer from London to Hull then on to Doncaster to visit his mother and sick brother Robert. He visited the family of Mr. Spence, saw Mary, who was then married, and then proceeded by rail to Eccles. The return journey, apparently by coach, from Manchester via Rochdale, Halifax and Bradford was said to be delightful but the appearance of the people very varied.

Near Manchester they were plain, rough looking and dirty. At Rochdale they were so much so that they appeared like savages, the children having nothing on but chemises and that split from top to bottom. Entering the vale of Todmorden there was a manifest improvement in the population. Their houses looked clean and neat, the women cleaner, better dressed and rather pretty, the men tall and handsome in their faces and persons. These continued through Halifax to Bradford where the women and men were again stunted in their stature plain in their faces and dirty. At and near Leeds they improved some little but as I pursued my journey from Leeds to Bedale there was a most marked improvement in the purely agricultural districts (52).

Apart from these remarks on the people Laycock passes no comment on sanitation, the industrial revolution or the political situation.

By July he was back in London and obtained a letter of introduction to one Colonel Evans recommending Laycock as a surgeon to the Spanish expedition, but nothing came

of this. It was fortunate for Laycock, as he later recounted the fate of the British Auxillary Legion in Spain. Many suffered illness, injuries and starvation and Laycock wrote "doubtless providence in its mercy overruled my efforts to obtain the office of Surgeon" (53). In August he was in Blackheath giving service (unspecified) to Birch and Barnett in return for board and lodging. What Laycock did in the following three months he does not tell us but commented Barnett was selfish, a prejudiced ignoramus in religion, a lubber in manners but Mrs. Barnett was somewhat better. Birch was middling in every respect and Mrs. Birch proud and vain.(54).

On the 19th November Laycock obtained his L.S.A. and then returned to Doncaster to spend his first Christmas at home for fourteen years.(55). From his account of his life in London Laycock had literary or journalistic ambitions in relation to medicine and this proclivity was to account for his future voluminous writings.

Radical Politics and Medicine

Like many others Laycock was anxious to maintain his religious faith and his own particular solution will be discussed later. Undoubtedly, as shown by his many later writings, Laycock was a reformer both medically and socially, but he was certainly not an extremist. He wrote in his journal at the end of December 1833 that he had visited Owen's Equitable Exchange Bazaar and was horrified by a stall near the door and commented:

I saw Cain by Byron, Payne's Age of Reason, Taylor's and Carlile's works, various Penny periodicals as 'The Pioneer', 'Man', 'The Political Soldier', 'Republican', 'Peoples Police Gazette' and various others, all works of the same infidel atheistical description. Never did I know the real beauty of true religion till I visited this loathsome spot. Everything is done which can contribute

to excite envy, hatred and malice in the lower classes. (56)

Appointment to the York County Hospital

An important date in Laycock's life was February 16th, 1836 when he was appointed apothecary to the York County Hospital and from then on he used every opportunity for publication. His maternal uncle, Robert Cattle, was a governor of the York County Hospital for more than forty years and Mr. Blahard, recorder of Ripon, was Laycock's proposer to the committee. He said that although Laycock's parents were not known to the committee, Mr. Cattle was a subscriber to almost every charity in York, and had never before asked anything of its citizens; he thought he was not now asking too much when he solicited their votes and interest for his fatherless nephew. Laycock was duly appointed by a majority of seven votes, 59 and 52. (57). The closeness of the vote was due to the other candidate, a Mr. Crummack, being supported by Dr. Wake M.D., J.P., a physician of the County Hospital and lecturer at the medical school, who said he had had Mr. Crummack as a student under his personal observation for five years. Laycock, however, had an advantage over Mr. Crummack in having studied in London and Paris.

Barnet (58) tells us the hospital apothecary lived in a little room at the back. His duties included keeping the records and registers, treating patients on the instructions of physicians and surgeons and compounding medicines. He kept the keys, saw that all doors were locked and the patients behaved themselves. Although rebuilt in 1851 the old hospital had physician's and surgeon's rooms together with various offices on the ground floor. The two main wards (one for males and one for females) each accommodating sixteen patients were on the first floor with a scullery and a bedroom for the nurse. There were hot and cold baths but these were for hydrotherapy rather than personal hygiene. On the second floor were two smaller wards, matron's room, the

operating room and a special room for post operative cases. Each ward had a "necessary house" and there was a courtyard containing a brewhouse and bakery. For his onerous duties the apothecary received a salary of £20 p.a. In February 1836 Laycock wrote in his journal "I am house surgeon at the County Hospital York elected by a majority of seven over my opponent. So after flattering, lying and electioneering in every possible way I have succeeded but I am not content" (59). An appointment for honorary physician or surgeon was always accompanied by canvassing like a political candidate but it is today surprising that similar tactics were required for a junior residential post.

York in the early nineteenth century.

Doubtless York had many attractions for ^{medical} ~~medica~~ practice: in addition to being the capital of his native County there were many centres of medical activity in which Laycock was to participate. However this was not how he saw things initially, for in February 1837 he wrote:

Must I follow my profession in York? No because there are many opponents in the field; it is not a very improving place, society is cramped: at least so far I have scarcely found a companion:- there are numerous sectarian and political parties, a vast [amount] of petty scandal, a deal of pride and not a little poverty. (60)

Social Conditions in 19th Century York

In the early years of the century there was much discussion and dissent about the old City Walls which resulted in some dismantling and some renovation. The roads were

bad, people travelled on horseback and goods were transported by packhorse or cart.

The number of passengers travelling by stage coach had vastly increased resulting in some roads being improved and bridges widened to meet the needs of the Mail coaches. The day of the coaches, however, was not to last for long as the railways soon made their appearance; the first railway for York was in 1839 going only as far as Milford Junction but allowing for a connection to Leeds. The opening occasion was thought to warrant a dinner at the York Guildhall with George Stephenson and George Hudson (then Lord Mayor) as guests. The following year it was possible to travel from York to London direct by rail in thirteen hours; this was a great change from Laycock's first coach trip to London with its discomforts from inclement weather, often a night on the road and stops to change horses.

A new prison was opened in 1835 which did away with the procession of condemned prisoners, nevertheless the hangings were still public drawing crowds who later came by rail. Some of the bodies of those executed were used for anatomy purposes at the York Medical School. At one time the Assize period was a fashionable season for York, with music festivals, concerts and dinners. The York Theatre Royal also held a prominent place and famous actors and actresses appeared there, but with the advent of the railways many of the County gentry forsook York for the London season. A general market was held weekly, a cattle market fortnightly and by 1835 there were three newspapers, The Yorkshire Gazette, Yorkshire Observer and Yorkshireman.(61).

York like many other Northern towns experienced great population growth in the first half of the nineteenth century, although less rapidly than the country as a whole.

TABLE 4.1 *Growth of the population of York, 1801-51**

	Population (York Municipal Borough)	% Increase	Population (York Parliamentary Borough)	% Increase	England and Wales (% Increase)
1801	16,846	-	-	-	-
1811	19,099	12.8	-	-	14.3
1821	21,711	13.7	-	-	18.1
1831	26,260	20.5	-	-	15.8
1841	28,842	9.8	30,152	-	14.5
1851	36,303	25.9	40,359	33.8	12.7

* Census enumeration abstracts, 1801-51.

Table from Armstrong A. (1974) p.77 Ref.(62)

Migration accounted in part for this growth, most coming from the surrounding countryside and after 1840 there was a large influx of Irish.(62).

TABLE 4.5 *Birthplaces of the inhabitants of York Municipal Borough in 1851**

Birthplace	No. of persons	No. of persons as percentage of total population
1. York (M.B.)	16,750	46.1
2. Elsewhere in Yorkshire	13,277	36.6
3. London	571	1.6
4. Surrey, Kent, Hants, Sussex, Berks.	202	0.6
5. Middx, Herts., Bucks., Oxon., Northants., Hunts., Beds., Cambs.	140	0.4
6. Essex, Norfolk, Suffolk	136	0.4
7. Wilts., Dorset, Devon, Cornwall, Som.	190	0.5
8. Gloucs., Herefords, Shrops., Staffs., Worcs., Warwicks.	296	0.8
9. Leics., Rutland, Lincs., Notts., Derbys.	598	1.6
10. Lancashire and Cheshire	531	1.5
11. Durham, Northumberland, Cumberland and Westmorland	989	2.7
12. Wales	55	0.2
13. Scotland	473	1.3
14. Ireland	1,928	5.3
15. Islands and British seas, colonies, foreign parts, at sea	167	0.5
Total	36,303	100.1

* 1851 Census. Population Tables II (2).

Table from Armstrong A. (1974) p.89 Ref.(62).

In addition to the York County Hospital, the York Medical School and the York Dispensary which are mentioned elsewhere, York had considerable facilities for mental patients, a County asylum had been established as early as 1777. It soon became apparent however that the institution was not satisfactorily administered, and an inquiry of 1813 revealed poor sanitary conditions, inadequate food and clothing, brutal treatment of patients and falsification of accounts. On publication of the inquiry report, a fire occurred at the asylum which killed four patients and destroyed much of the evidence (63).

In 1791 a Quaker girl had died under suspicious circumstances at the York Asylum, as a result of which the Society of Friends led by William Tuke, founded their own institution which opened in 1796. In order to convey their idea that the establishment was a place where the unhappy might find refuge, they called it The Retreat. A description of the management of The Retreat by Samuel Tuke (William's grandson) was published in 1813 and this volume had a very great influence on running of asylums: chains and corporal punishment were abolished and stress laid on occupation. Violent patients were separated from others and restraint was sometimes required to prevent injury to others, but a state of furious mania was rarely seen. (64).

The state of sanitation and health of the population are commented on separately as Thomas Laycock took a special interest in public health during his residence in York. The early York years were, to an extent, to determine the future course of Laycock's life, thinking and work and during this period the journal has few entries but on 23rd April 1837 there is a meteorological note on the severity of the winter since October 1836. The week before writing there were three inches of snow in York while in some places mail coaches were stuck in it. The day of writing was excessively cold and Laycock asks the reason "Is it the comet of last year? The year 1260 was the year following the same comet and in that year the Mediterranean Sea was frozen over".(65). The source of this piece of information is not given. In the same year (1837) the diary notes the burial of King William on 4th June as a Cathedral bell tolled in the night causing Laycock to awake two or three times.(66).

Laycock starts his Medical Writing

Soon after Laycock commenced his first post he started writing; his initial paper in 1837 was entitled "On the Acid and Alkaline reactions of the Saliva, a series of clinical and experimental observations."(67). This is written in the form of a seven page letter in response to a paper in a French Journal Archives Générales claiming that by the use of litmus paper it was possible to differentiate between inflammatory and non-inflammatory disease of the stomach. Using litmus and tumeric papers to grade saliva from strongly acid to strongly alkaline, Laycock investigated forty eight patients with a diverse range of conditions. It was known from medieval times that certain vegetable dyes changed colour under conditions of acidity or alkalinity, but it was Boyle who first developed test papers as tests for acidity and alkalinity. (68). The patients had varying diets, observations made morning and evening and the condition of the tongue noted. Results were reported in seven tables and it was concluded acidity of saliva was not a diagnostic marker of gastric derangement. Laycock's article was commented on in the British and Foreign Medical Review which said "This is an interesting addition to the physiological subject to which it refers and is precisely such a communication as housesurgeons of hospitals are so well qualified to give, but which, we are sorry to say they so rarely do give" (69). This was certainly a good start for a house surgeon's first paper. It was followed by a series of six papers on general medical subjects including "On the advantage of Water Cushions for the bedridden" which claimed to be the first introduction of such cushions which were later to become widely used. Laycock took an air cushion made of waterproof material and available in shops, filled it with water and placed it beneath the hips and sacrum of a patient with dreadful pressure sores. He then commented that a Macintosh sac moderately filled with water and laid on a mattress would be as good as a hydrostatic bed and much cheaper (70). This was an unusually practical approach by Laycock.

By February 1837 Laycock wrote in his journal:

something more than a year has passed since I was elected to the office of house surgeon in this hospital. How long must I keep it? All my debts are paid, I believe I am worth £30 in money besides sundries such as books etc. Precious little to do anything.....must I follow my profession in York? No! because there are many opponents in the field; it is not a very improving place - society is cramped, a vast amount of petty scandal, a deal of pride and not a little poverty. But uncle can assist - perhaps not, at least I have no certainty as he is now within six weeks of threescore years and ten and his life may not be for long.....then suppose I eschew my profession and follow the galvanic scheme which I think is assuming a tangible form. (71).

Not surprisingly, the galvanic scheme came to nothing, and by April 1837 Laycock wrote he was learning German and it would appear he had decided to stay in medicine and obtain a Doctor of Medicine degree. His important papers on hysteria were published in 1838 and are considered in detail in Chapter 4; they showed a complete change in his style of writing from his earlier papers which were based on empirical observation. His new approach was to write at greater length, discuss and quote past authors, to explain symptoms and pathology and to deduce general principles or, as he often called them, laws. His reading and thinking was referred to in his journal for February 1837 when he recorded "I do not gather as the ant but as the bee. What I read must be licked into shape by my brain." (72). This metaphor, Barfoot tells us, came from an eighteenth century mathematician Colin Maclaurin who used it to illustrate the Baconian view that the empiricist, like the ant, gathers facts, the spider spins webs of theories while the bee unites both into scientific knowledge (73).

The Göttingen Visit

The notes from Laycock's journal indicated that he started to learn German in April 1837, and in August the following year he recorded he would graduate. Thus the Göttingen visit had been planned for some time. (74). In order to advance his professional career Laycock wished to obtain an M.D. Göttingen offered the prospect of a worthwhile degree with minimal expenditure of time and money. The examination was an oral one and later in life he recorded that his hysteria papers in the Edinburgh Medical Journal were accepted as a thesis (75). It is noteworthy that both Prochaska and Unzer were quoted before the visit to Germany which seems to suggest Laycock started to learn his German from their medical texts with the aid of a dictionary and grammar. I consider the use of various German sources in the development of the concept of reflexes of the brain by Laycock in chapter four. However, in spite of knowing some German he did not consider himself adequate in that language and asked to be examined in French.(76)

Laycock's Views on M.Ds. and the Royal College of Physicians

The M.D. was viewed very differently from qualifying examinations and in 1841 Laycock considered:

It ought to be a prerequisite to the granting of the highest degree in medicine that a certain number of years be spent in general practice; and the opportunities for this would be afforded by dispensaries. The M.D. is usually considered in England as an individual to be consulted in cases of difficulty --- . If the doctorate be considered as indicative of a superior knowledge of disease, it can never be granted like other academic degrees. Medical skill must be required amongst the people at large, and

not limited to the walls of a general hospital. (77)

When writing this Laycock had not yet been appointed to the York Dispensary and it was his apprenticeship and time at the Westminster General Dispensary that had taught him the necessity of seeing patients in their daily surroundings.

A prominent teacher of Göttingen University at the time of Laycock's visit was Dr Karl Marx (1796-1877) who, among other things had an interest in the history of medicine. He was the first to indicate the importance of Leonardo da Vinci in anatomy and to list and classify medical writings (78)

Later Marx was to write of Laycock-

On the 17th July 1839 Dr Laycock of York passed his examination in medicine, surgery and midwifery before the Medical Faculty of this University in so singularly distinguished a manner that, when admitted to his degree on the 19th July he received the highest possible praise the Faculty confers. His book on "The Nervous Diseases of Women" which appeared soon after, gained for him a good reputation in Germany among those who take an interest in English literature as the critical reviews sufficiently show. His continued and multifarious scientific researches were such that the reputation of the author constantly increased so that he is now considered in Germany to be one of the most industrious and sagacious and accomplished physicians of England. (79)

A relationship between Marx and Laycock developed which was more than that of a pupil and a lecturer and examiner. In 1843 Laycock published an account of Marx's travelling in England based on information which could only have been gained in an informal situation (80). Laycock's knowledge of German and of Göttingen were to be put to good use in subsequent years when he published articles utilising the experience gained during his visit or translating and commenting on subjects from German medical

journals such as " The Unity of Medicine and Surgery. A Review of Von Walther's Ueber das Verhältniss der Medicin zur Chirurgie" (81)

The visit to Göttingen was associated with a wide tour of Germany and Austria and thus served a double purpose, firstly in stimulating Laycock to further study of the German medical libraries and practice, and secondly in helping to consolidate his ideas on cerebral reflexes. Having obtained his doctorate Laycock commenced as a practising physician in York, although following the custom of the day, he also did some surgery.

To further strengthen his position as a physician Laycock obtained a licentiate from the Royal College of Physicians of London. From the time of the foundation until 1858 the College of Physicians of London had the exclusive right of licensing those physicians who practised within the City of London or a seven mile radius of the City.

Those so licensed were known as inter urbem licentiates while for those in the provinces there was an extra urbem licence which did not confer any legal status. In the early 1800's very few provincial physicians bothered to take the qualification but by the 1830's and 1840's national registration was being considered and many physicians in the provinces sought to safeguard their position by becoming extra urbem licentiates. Among these was Thomas Laycock who came to London in 1842, the examination was entirely oral and conducted by the president and three elects. (Elects were a group of eight fellows who chose the president from among their number). The relevant minute reads (82) "Dr. Thomas Laycock produced certificates of Medical studies and Hospital attendance in London and at Edinburgh, at York and at Paris. Also a Diploma from the university of Hanover. He was examined and approved and Letters Testimonial granted to him." Edinburgh is an error as Laycock had not studied at that city.

Intra urbem Licentiates were examined more thoroughly than those extra urbem; for the inter urbem examination there were three parts, physiology pathology and therapeutics, which from 1838 included a written paper. A College History states (83) "the extra urbem licence was pitched very low and seems to mean that the provincial physician need not be more than half as well trained as his brother in London."

The College of Physicians proposed in 1848 that its authority should be extended to cover the whole of England but according to Laycock provincial licentiates would only be admitted after a further examination and payment (84). An association of extra urbem licentiates was formed with Laycock as secretary to resist these proposals; an interview with the president and other officers of the College was not very productive and no change was made until 1858.

York Medical Society

Laycock became a member of the York Medical Society in 1839 being proposed by Mr Husband a surgeon and seconded by Mr Anderson. He attended several meetings, read a paper in January 1840 on the relation between nervous diseases and diseases of the kidney, but in 1841 Laycock published an account of the previous meeting of the Society in the Dublin Medical Press and the Society then passed a motion that it was inexpedient to publish its transactions. This led to a division in the Society resulting in the resignation of Thomas Simpson, an influential physician to the York Dispensary, Mr Husband and Laycock. Subsequently Husband and Simpson were re-elected but Laycock played no further part in the York Medical Society in spite of an effort to re-elect him in 1854 (85).

The York Dispensary

A prominent medical movement in the eighteenth and nineteenth centuries was the foundation of dispensaries which, like the hospitals, were born of philanthropy. The need for dispensaries arose as hospitals could not meet all the needs of the sick poor; often hospitals had no outpatient facilities, midwifery services, arrangements for patients to be visited in their own homes and did not admit fever cases. Dispensaries met these

needs but had no inpatient beds, so that the services were complementary (86). York had a dispensary from about 1788 (87) to meet such needs, and although the apex of aristocratic patronage was past, there were a sufficient number of prosperous citizens to maintain both the hospital and dispensary. The visiting medical and surgical staff was increased in 1841 and Thomas Laycock was appointed physician, a post in which he gained much experience and which was later to be invaluable for teaching purposes.

York Medical School

It must have been a very satisfying occasion for Laycock when he was appointed lecturer at the York Medical School in 1848 but he made no reference to this in his Journal. The school was typical of many others founded in the nineteenth century. It was an era of rapid population growth with increasing numbers of hospitals and it was in relation to these that provincial medical schools developed. The suggestion of a medical school for York was first mooted in 1833 and was opened in October 1834 although not without opposition. There was no separate building for a medical school as such, lectures being given in a room in the hospital and a laboratory at the Yorkshire Museum was made available for laboratory teaching. Clinical instruction was given both at the County Hospital and the York Dispensary; the Ophthalmic Institute and the Institute for Diseases of the Ear were opened to students without additional fees and instruction was given in psychological medicine with clinical facilities at The Retreat. Midwifery was also freely available in the district.

The School continued until 1862 and it has been suggested that reasons for closure were insufficient teaching beds (a minimum of one hundred beds was required by the General Medical Council), a decreasing number of students and the proximity to a much larger school in Leeds. (88).

British Association for the Advancement of Science

The first meeting of the British Association was in York in 1831 and a second significant meeting also in York, was in 1844 with William Harcourt, son of the Archbishop, in the Chair. Harcourt attempted to explain the differences between the scriptural account of creation and scientific findings by saying the language of scripture was highly figurative and conveyed a transcendental truth. This did not satisfy the Dean, William Cockburn, who clashed with Adam Sedgwick, a clergyman and Professor of Geology at Cambridge, on the age of the earth. Sedgwick and William Buckland, Dean of Westminster, said the study of science did not lead to materialism but towards God, while others thought they were only viewing the physical world from a religious angle (89).

The York meeting also saw the demise of the Medical Section, only eight papers being given, three by Thomas Laycock.(90) He dealt with "Reflex Function of the Brain", "On the Sanitary Conditions of York 1839-43" and "Addition to Vital Statistics contained in the first report of the Commissioners of the Enquiry into the circumstances affecting the Health of Towns." He also gave a further paper on "Suggestions for the Observation of Periodic Changes in Animals" (91). Laycock was a master at reworking the same material to give the maximum number of papers.

In the latter part of Laycock's period in York much happened in his personal life. He married Anne Lockwood on the 27th April 1848 at Kirby Fleetwood where Anne's brother was Vicar and proceeded to Edinburgh for the honeymoon. Robert and Mrs Chambers were the only people whom he knew in that city, but he took the opportunity to call on J.Y.Simpson and when the British Medical Association for the Advancement of Science met in Edinburgh in 1850 Simpson entertained both Laycock and Carpenter.(92). On 6th December 1851 Thomas and Anne's firstborn son died at birth. This was attributed to Anne falling down some steps a week previously which induced premature labour (93). Their next child Edmond was born on 7th October 1853 but was always a sickly child.



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CHAPTER 3

BIOGRAPHY (Continued) LATER YEARS

The year of 1854 can be seen as a turning point in Laycock's life and career

A Vacancy at the York County Hospital

The first vacancy for a physician at the York County Hospital for which Laycock could apply arose in 1854 when Dr Belcombe retired. Laycock published a letter to the trustees and governors of the hospital in the Yorkshire Gazette (1) saying he offered himself for appointment, outlining some of his qualifications and stressing his association with public health. An entry in his journal for the 6th May 1841 stated "I have quarrelled with Robert Cattle who, if he were not my mother's brother I should consider nothing but an old scoundrel; and received 30 guineas" (2). At this time Robert Cattle was Lord Mayor of York but he died in October of the following year.(3) The quarrel with the powerful George Hudson will be described in Chapter 5 and there can be no doubt that the loss of support of these two influential persons cost Laycock dearly, for he was not appointed and the post went to Dr Shann (4). The only report of the house committee for the York County Hospital to survive is for 1841-2 which does not list Dr Shann as a subscriber while Laycock is listed as a member of committee.

In spite of this failure Laycock was not unduly upset. His reputation and practice were increasing and in 1854 he published six papers, five relating to psychological medicine and one to meteorology.

The Edinburgh Appointment

It was at the time of the York meeting of the Provincial Medical and Surgical Association in August 1855 that Laycock received a surprise letter from J. Y. Simpson informing him that William Alison had resigned his Chair of the Practice of Physic owing to ill health and suggested he (Laycock) should be an applicant for the post. Several visiting physicians had to be entertained to dinner so Laycock wrote to Simpson asking if a graduate of Göttingen and an extra Urbem Licentiate of the Royal College of Physicians of London was eligible. He was tempted to apply, as to occupy the Chair of Cullen and Alison would provide opportunity for remodelling medicine in accordance with modern science and Laycock dreamed of being ranked with Galen, Boerhaave or Cullen. He could guide the minds of the young and escape the professional rivalries of York (5).

Following the meeting dinner, Laycock was still undecided. His wife was reluctant to leave York as the decoration of their new house had just been completed, and they had contemplated a lifelong residence in York. Moreover his wife had many friends and connections and used every reason she could think of for not leaving York. Laycock discussed the situation the following day before breakfast, with two guests who were staying with them, Dr Noble a surgeon and phrenologist from Manchester and Professor Williamson who held the Chair of Natural History at Manchester. The discussion could not have been a long one, as after breakfast Laycock had decided to apply for the chair and was on the 9 a.m. train to Edinburgh (6).

Appointments to the University except for Regius Chairs were vested in the Lord Provost and Town Councillors, although many other influential persons could affect appointments or policy. All professors to the medical faculty had the word physic or medicine in their titles and the subjects they taught were compulsory for degree examinations. They were entitled to class fees for teaching in the wards and to examination fees.

Laycock's tasks following his decision to apply for the Chair were to compile a list of his appointments and publications and to gather as large a number of testimonials as possible. J.Y.Simpson advised Laycock on the wording of his application and which of his testimonials were worth submitting, copies of which together with his publications were printed and circulated to the Lord Provost and Patrons of the University (7). Everything about a candidate including his religion and politics were taken into account and often candidates voiced anything they knew to the detriment of other candidates.

Election involved canvassing among the Town Councillors and asking for pledges of votes. In addition to the thirty-three Councillors, a large number of other persons had to be approached. In this Laycock was assisted by Simpson and Robert Chambers who knew well the local situation and the various influences that could be brought to bear on the appointment. The approach adopted by Laycock was gentlemanly, he did not speak against other candidates but in modest terms described his own experience, qualifications and reasons for applying for the post.

Other candidates were J.H.Bennett, Professor of the Institutes of Medicine (Physiology) and the physicians A.Wood and W.T.Gairdner who were all Edinburgh graduates. The ballot was complicated by first and second votes, but Bennett was rejected at the first count and on the second Laycock was elected by a majority of two over Wood.(8) Thus on the 2nd. October 1855 Thomas Laycock was Professor of medicine.

The journey to Edinburgh could not have augured well for Anne, it was wet and stormy and water flooded the rails, but Robert Chambers had found temporary accommodation for them and Mrs Chambers had arranged for fires to be lit. (9)

The Edinburgh medical scene was a very different one from that of York. The York County Hospital had hardly 100 beds, whereas the Royal Infirmary had four times that number: the York medical school had perhaps twenty students, while Edinburgh had about 400. Moreover the Edinburgh Medical School was part of a University with many faculties, while York only provided hospital facilities with some anatomy,

chemistry and botany to enable students to become licentiates of the Society of Apothecaries or members of the Royal College of Surgeons. (10)

Nor did Laycock find the peaceful harmonious professional relationships he had hoped for. He felt his colleagues were hostile to him, although his services were sought for public meetings,; J.Y. Simpson on whose support Laycock had counted for his private practice, failed to call him in consultation after the first Christmas.

Further distress for the Laycocks occurred during the Christmas recess; his second child George had a severe convulsive attack for which J.Y.Simpson ordered leeches but these Laycock considered bled the child excessively causing prolonged weakness. (11). Some brightness might have come for Anne in the following Spring, as they obtained a permanent home at 4 Rutland Street where they were to reside for the rest of their lives.(12).

For Laycock initial events were not happy, as in the Spring term of 1857 a difficulty arose over clinical instruction which involved Bennett who did not accept defeat gracefully. The dispute started in the Spring of 1856 and involved instructions on the professorial wards. The number of teachers for these varied from two to four and when Christison resigned his University teaching duties, only Bennett and Laycock remained, teaching being given only in the Winter, Spring and Summer sessions but not the Autumn.

Christison delegated his Winter course for 1856-7 to Bennett, Laycock followed with the Spring session, but then Bennett also claimed the Summer session for 1857. Laycock further stated Christison had previously intimated to Bennett that he should resign taking his share of clinical teaching with him without telling Laycock. A further point of difference arose in that Laycock alleged Bennett had appropriated fees which did not belong to him, but said he would give them up if Laycock agreed to a plan of a further teaching physician.(13). Not surprisingly Laycock objected to this as he thought it would isolate him rather than providing an ally and two rival clinical professors would have conflicting interests. Not being able to resolve the issue in any other way Laycock appealed to the patrons who passed a resolution supporting him and

the Senatus Academicus who had supported a second clinical Chair rescinded the scheme. On this issue Laycock emerged victorious.

An account of this affair was published and circulated by Laycock under the title Correspondence and Statements regarding the Teaching of Clinical Medicine in the University of Edinburgh 1855-57, and this resulted in comments in the press. (14). This was extensive giving a detailed account of correspondence and involved Dr Balfour as Dean of the Faculty and Syme who attempted to arbitrate on the matter of fees by suggesting a complex division, as the Summer course always attracted more students and was therefore more profitable. This was unacceptable to Laycock who claimed that for 1857 he would receive 20 guineas while Bennett had 109. A Sequel to Correspondence and Statements regarding the Teaching of Clinical Medicine in the University of Edinburgh was published,(15) as Professors Christison and Syme had written to the Town Council complaining of inaccuracies in Laycock's statement. This Laycock refuted and was able to prove his case by producing original documents. He asked what would have happened if he had not kept copies of all the correspondence involved. No one came out of this with any credit and the profession was not shown in a favourable light.

Bennett continued to harbour bitter resentment and in the late summer of 1858 at a political meeting relating to the Town Council and Universities Bill attacked the Council and Simpson on the subject of Laycock's appointment, an attack which led to correspondence in the national and local press. Laycock recorded a detailed account of this meeting and considered he emerged from the controversy in a much more favourable light than Bennett. (16)

A happier event was in May 1857 when the Laycock's last child and only daughter, Beatrice Rachel was born but this was marred by Laycock's ill health. In the Spring of 1858 he was unable to lecture for some time, his classes being taken by Dr Wood, and Simpson circulated an unfortunate report to the effect that Laycock was dying of consumption. Gairdner later told Laycock that Simpson had advised him to be

prepared to apply for the Chair of the Practice of Physic when Laycock died, or was too ill to continue in the post (17).

A Family Disease

Tuberculosis was a common and all too often a fatal disease in the Victorian era and entered into the literature of the period, sometimes being termed a decline, with the sufferers (if they could afford it) going to the Riviera or the Alps. Known as 'the white plague', it accounted for about 40,000 deaths each year (18). A contemporary historian writes "Tuberculosis was the century's single leading killer in temperate climates" (19).

Entries from Laycock's Journal tell us of his own health and that of his family and the nature of their illnesses. These relate especially to his brother Robert and his sister Mary Anne. An entry for 19th May 1835 (20) recorded that having travelled from London to Hull by steamer and then on to Doncaster, he found Robert at home with a 'scrophulous great toe'. When back at Doncaster for Christmas Robert had a scrophulous ankle joint (21) and by May the following year Laycock noted that brother Robert will end by losing his leg or his life (22). In July Laycock saw Robert again and observed he was a skeleton, not yet twenty years of age and by the following July he was dead; Laycock regretted he was not present to give comfort and support.(23). Writing in August 1838 (24) he gave his opinion that his sister Mary Anne who was suffering much would probably last another month; she died on September 9th 1838 and Laycock sat with her the previous night from 10.30 p.m. to 2 a.m. Her death was a peaceful one with her mother on one side and her doctor brother, Thomas, on the other; she assured them there was no dark valley and she was perfectly resigned.(25). Both these almost certainly died from tuberculosis.

In July of 1842 Laycock recorded in his journal that he was now passed forty years of age, his hair becoming grey, his teeth failing and for two years he had had gout in his knee. He wrote:

Eternity is visible to me now very plainly in the distance and the daily anticipation of death is forced upon me..... In religion I seek God more and more in the phenomena of visible things and finding Him there, commune with Him in my own heart and hope I shall wake up in his own likeness (26).

He may well have realised the problem with his knee was a tuberculous arthritis. This is the last entry from York, there is one from Edinburgh in the year 1857 and then his journal ends. The year 1860 saw another tragedy for the Laycock family; their elder son, Edmund Robert, always a sickly child, died on Christmas Eve aged seven years.(27). It is tempting to think that his cause of death was also tuberculosis.

In some ways the illness of 1866 marks a watershed in Laycock's life. From many obituaries it is known that Laycock had a left mid thigh amputation performed by Mr James Spence in 1866 and according to one source this was done without anaesthetic.(28). James Spence was appointed a surgeon to the Infirmary in 1854 and Professor of Surgery in 1864 at a time when Syme was still Regius Professor. Spence was described as a tallish, slightly stooping figure with a slow semi-swinging walk, his rather pronounced features with their thoughtfully anxious, half sad expression, earning for him the soubriquet of 'dismal Jamie' (29). He was the author of a two volume publication Lectures on Surgery which went through three editions and he was the originator of a type of amputation involving disarticulation at the hip joint. Less well known than Syme and Lister, there is no evidence he was an inferior surgeon. and he was not involved in public professional disputes as were many of his colleagues. Laycock probably would have been thinking of brother Robert when he decided to sacrifice his leg rather than his life. The operation was performed at home, but no records of Laycock's own illness have been found in Edinburgh. His life hung in the balance at one time, and although eventually able to resume his official duties his health remained indifferent. Presumably he was nursed by his wife Anne and possibly they had some professional or other help, but nevertheless a great strain would have been placed on Anne. When he was able Laycock spent time enlarging his "Account";

a near fatal illness may well have prompted him to examine his past actions and to write in order to clear his conscience.

Tuberculosis was well known as a family disease although the reason for this was debated. Some thought miasma (environmental poisons) a strong aetiological candidate but some inherited weakness or diathesis was also thought important. This debate continued after Koch's work on the bacillus (30), and had Laycock been alive at this period one can imagine him still stressing diathesis while accepting the tubercle bacillus could be found in affected patients.

Another political battle described by Laycock concerned the appointment of University principal in 1869. This was caused by the death of the principal Sir David Brewster; Professor Macdougall who held the Chair of Moral Philosophy died about the same time and it was thought that Sir Alexander Grant, Chancellor of the University of Bombay, might come forward for a combined appointment. J.Y.Simpson was also a candidate and the appointment was associated with the usual plotting and grouping of parties in the University.

Simpson asked Laycock for his support to which Laycock replied he had no personal objection but felt there was so much opposition by some members of the Senate that it would be in Simpson's own interests not to occupy the principal's Chair.(31). In the event Grant was elected.

The Death of Anne Laycock

The year of 1869 must have been an exceptionally difficult one as it was the year of Anne's (née Lockwood) death. We know very little of her private thoughts and feelings, of her last illness or her death beyond that she died in York. Nothing is known of the family relationships but it seems probable that at the time of their mother's death, both the son and daughter were still at home, George being only fourteen years of age and his sister twelve. In August of 1869 Laycock was President of the Medico-

Psychological Association and he returned to York for the meeting and to deliver his Presidential address; it is likely his wife accompanied him.

Having given his presidential address Laycock chaired the annual dinner at the Royal Station Hotel, the guests numbering over seventy gentlemen (whether there were any ladies was not recorded), and among them Laycock would have been pleased to see two of his old students, Crichton Browne and Hughlings Jackson. Among many toasts proposed was one to the Lord Mayor of York, who responded by recalling events of twenty-five years previously when Laycock had been associated with the sanitary movement in York.

In the evening there was a *conversazione* attended by some two hundred ladies and gentlemen arranged for some citizens of York to meet members of the Medico-Psychological Association, but it appears the President did not attend. (32).

It seems highly likely that Anne was present in York at that time, but unwell since she died in York some eight weeks after the annual meeting (33). It may well have been her wish to die in York, the town she never wished to leave.

After Anne's death in November 1869 and again in April 1870 (34) Laycock chaired meetings of the Scottish Division of the Medico-Psychological Association. The election of T.Christie as Medico-Psychological Association secretary was supported by him at the Annual Meeting of 1872 as was a suggestion that the press should be admitted to meetings. (35).

Last Days

An obitulist recalled some of the events of the last months of Laycock's life. In April 1876 he caught a cold whilst making a train journey and this activated old disease in his right lung; he began to cough, to suffer from dyspnoea, to vomit after meals and was unable to attend to professional duties (36). He must have realised the seriousness of his condition for in June he wrote his last Will and Testament. (37). After paying all his debts and expenses small legacies were left to his nieces, daughters of his brother James; the rest of his estate was to be shared between his son George Lockwood and his daughter Beatrice Rachel. Financial control was not to be given until George was 25 years of age although the Trustees could advance a sum to establish him in life. The Trustees were also empowered to pay Beatrice such as was proper for her support and maintenance and she had to marry with their approval. George was to have Thomas Laycock's correspondence, manuscripts and lecture illustrations, which were at the University, to publish or otherwise as he might choose. One of the two witnesses was his sister-in-law Ellen Tabitha Lockwood who was resident with him at the time of writing the Will. Possibly his sister-in-law remained with him as his illness progressed and although mentally alert to the end, speculating on his own symptoms and favourite medical questions he became physically prostrate and died on the 21st September 1876. A post-mortem examination revealed old tubercular disease in both lungs with considerably more recent disease in the right lung. The brain weighed 48ozs. and although there was some atrophy, convulsions were reported to be exceedingly numerous.(38) but who performed the autopsy was not stated. Laycock was interred in the family grave with his son Edmund and wife Anne in St.John's Churchyard which also contained the graves of his predecessor William Alison and Sir William Hamilton. The inscription on the tombstone reads:

Sacred and in memory of Thomas Laycock Professor of the
Practice of Medicine, Edinburgh University. Died 21st Sept.

1876 aged 64. Anne his wife died at York 4th Oct. 1869 aged 47.

'They serve him day and night in his temple'

Edmund Robert their eldest son born at York 7th Oct. 1853

died at Edinburgh 24th Dec. 1860.

'With Christ which is far better'

And of George Lockwood their second son died at Melbourne

24th May 1926 and interred there.

Few honours were to come the way of Laycock; he was made a Fellow of the Royal Society of Edinburgh in 1856 (39) and his only national honour was in 1859 when he became Physician to the Queen in Scotland, in place of his colleague Dr Begbie who had died. An announcement in the B.M.J. said this was in recognition of his position and ability and would be received with pleasure by the whole profession; the latter was part of a polite editorial notice (40).

George Lockwood the only surviving son qualified M.B. Edinburgh just before his father's death, but later studied at Wurzburg and Vienna before emigrating to Victoria, Australia probably about 1880 when he was 25 years of age and master of his own inheritance. He translated Koch's Aetiology of Cholera in 1886 for the New Sydenham Society, a work which would have been a revelation to his father, had he lived to see it (41). It is evident that he did nothing about his father's manuscripts, and lecture illustrations, as many of these remain in the University of Edinburgh. It is known that Laycock had a considerable private library but what became of these volumes is unknown. Possibly George took them with him to Australia. There must also have been a considerable amount of manuscript and other material remaining in his house and these constituted the collection given by his daughter to the Royal College of Physicians in Edinburgh and which are now catalogued as the Thomas Laycock collection. The manuscripts in the collection are often difficult to read, some words being indecipherable, there are many alterations and erasures and many undated items.

Looking at that which relates to after 1866 it is apparent that Laycock kept up a correspondence, often with patients or their relatives, collected material for, and updated

his lectures and engaged in a considerable amount of writing. No material has been found however of correspondence with his more famous old students, Jonathan Hutchinson, Hughlings Jackson, Crichton-Browne or David Ferrier but it is most unlikely that he failed to correspond.

Thomas Laycock's Character and Reputation

An examination of the testimonials totalling 87 written in support of Laycock's application for the Chair of Medicine show an extremely wide and great admiration for his teachings and writings. Some came from the highest in the country, Sir James Clark, Physician to the Queen, Sir Henry Holland, Physician in Ordinary to the Queen, and Sir John Forbes, Physician to Prince Albert.

Academic support came from W.W.Fisher, Professor of Medicine in the University of Cambridge, W.H.W.Walsh, Professor of Medicine, University College, London and Professors E.W.Murphy, R. Quain and W.Sharpey, all of Laycock's alma mater University College, London. Provincial academic support was given by J.B.Davies, Professor of Medicine, University of Birmingham and by many physicians teaching in the provincial schools of Sheffield, Liverpool, Manchester, Leeds and Dublin. Unanimous support came from students of the York Medical School and some e.g. William Carpenter said their support was from an intimate personal knowledge. Backing from the Church was given by testimonials written by the Archbishop, Dean and Members of the Chapter of York. From the Continent enthusiastic testimonials were given by R.Virchow and K.Marx of Germany and Drs.Trousseau and Gendrin of Paris. Even those with whom Laycock had previously quarrelled such as T.Simpson of York and Sir Charles Hastings witnessed to Laycock's ability, industry and integrity.

From various sources including his own Account, it may well appear that Laycock was a quarrelsome and contentious person, possibly with paranoid attitudes, but his conduct must be judged against the standards of the time. Severe competition existed

between medical men in the nineteenth century for patients who could pay. Further there were many dubious therapies and diagnostic methods, so that Laycock's differences with Thomas Simpson of York had as one of the issues the latter's involvement with astrology and mesmerism. (42). Nor were such disputes limited to York; differences were often expressed in the Lancet, and Marland (43) relates that professional disputes were often aired in the local paper of Northern towns.

Edinburgh was notorious for its professional quarrels, those between Simpson and Syme being well known. (44) A dispute between John Lizars and James Syme led to litigation, as did an allegation by Bennett that Wood, a free church deacon, had made a young girl pregnant (45). Perhaps disputes became more obvious in Edinburgh as it was a smaller town than London with only one major teaching centre.

At times, in his younger days, Laycock was belligerent, as in his quarrel with Newport when a student; he failed to walk away as he did with Collier and in the Account (46) he spoke of the stimuli of combat. On the other hand he was given to examining his own conscience even to the extent of considering whether his time had been well spent. (47). It was this practice of self examination which led him to write the Account.

Laycock's industry and intelligence have never been doubted and his paranoid attitudes can be understood in the light of his background personality. He was a sensitive person with feelings of insecurity, his brother being his only true friend. Inferiority feelings were constantly with him in early days, as he realised the difficulties before him for professional advancement, for he lacked influence, patronage and financial backing. Further inferiority feelings may have been generated by his short stature and ill health which progressively troubled him throughout life.

His obituries show a marked contrast with those of J.H.Bennett. None mention Laycock as a difficult or contentious person, although many thought him too philosophical to be a good teacher of medical students. A long obituary of Bennett printed out his abilities and attainments and later reads:

His tendency to indulge freely in critical and sarcastic

remarks upon the works of others did not make him a general favourite with some of his professional brethren

There can be little doubt the one qualification wanting in Dr Bennett..... was the power of correctly appreciating the work of others

The individual peculiarities of Dr Bennett's character were so pronounced that his relations to many men still alive were so often antagonistic as to render it impossible at present to form or give expression to a true estimate of what he accomplished (48)

By 1855 Laycock already had accomplished much and had an established practice in York, a comfortable new home and had published more than most medical men in their lifetimes. From the start of his career Laycock tells us that he was ambitious and the Chair of the Practice of Physic at Edinburgh was the most prodigious in the United Kingdom; he further gives us reasons for his wishing for the post. The Chair would give him the occasion to carry out a dream he had of remodelling science and the practice of medicine with the progress of science (49). His aim was:

To revolutionise mental science or metaphysics, do for it what Bacon did for physics. In every branch of medicine I developed new ideas.

And the result

On every hand, with few exceptions, I meet with opposition, distrust, lukewarmness. This is natural. And yet there is a feeling of justice in the public mind towards me which will find utterance (50).

Soon after taking the Edinburgh Chair, Laycock felt that the future was for him to be no brilliant success. Happy if he were not to be borne down and become a total failure (51).

In spite of ill health, especially after his leg amputation in 1866 and difficulties in personal relationships among the Royal Infirmary staff, Laycock struggled on with his writing until the end. Personal quarrels figure less; he was more concerned with past issues and memories. An obituarist wrote

His strength was utterly prostrated at the last, but mentally he was quite clear and fond as ever of speculating about his own symptoms and sensations and favourite medical questions (52).

This would be in keeping with Laycock's character and the Edinburgh tradition; James Spence, Laycock's surgeon suffered an amputation of his own leg later in life. When he had sufficiently recovered he requested his scalpels and his foot back in order to dissect it. (53).

Although Laycock's period as a Professor of Medicine was not a happy one from a personal point of view or a successful one professionally, he was to consolidate his views by various publications especially Mind and Brain and to establish the teaching of psychiatry in the University of Edinburgh. These are discussed in later chapters.

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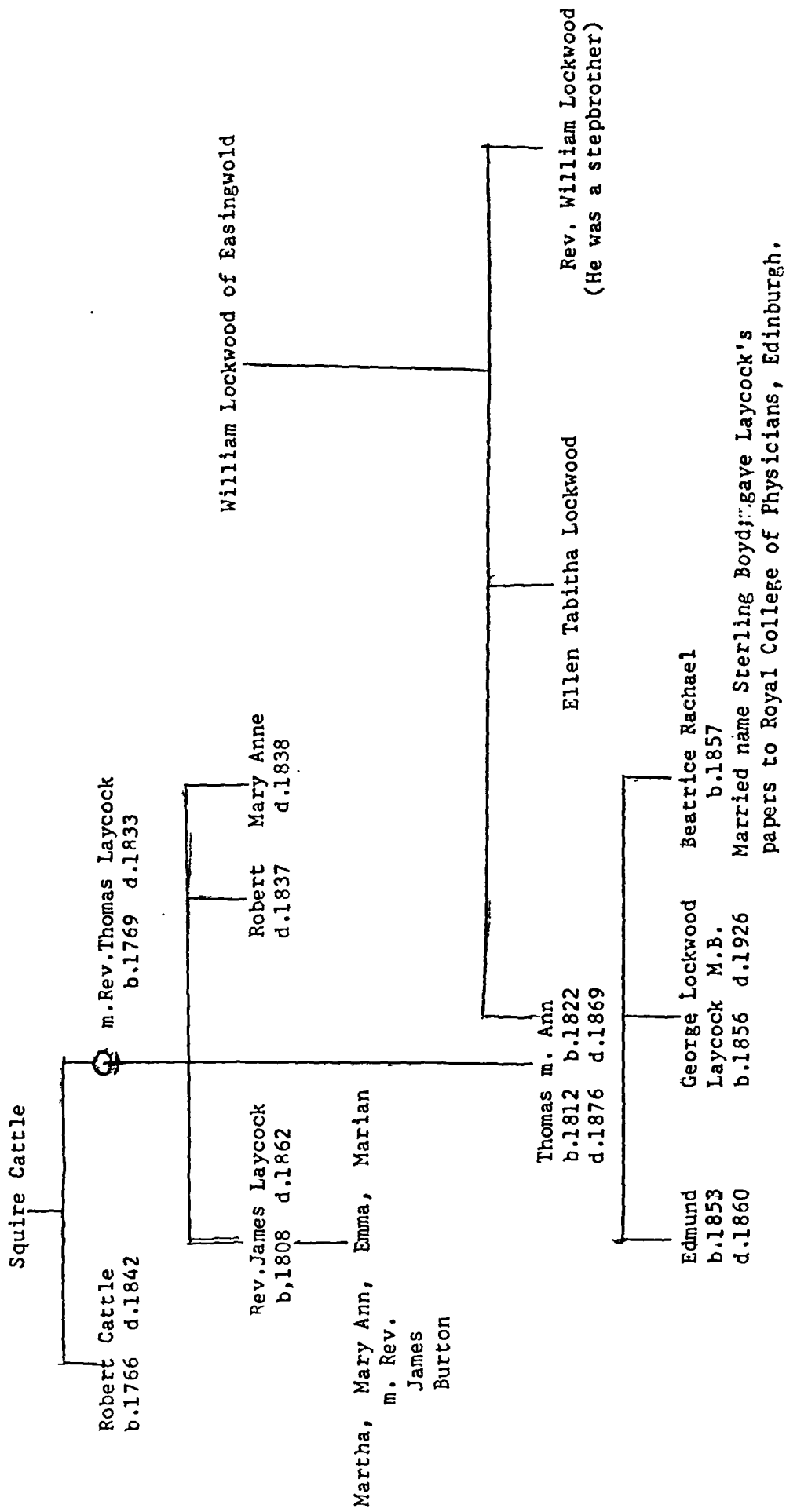
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PEDIGREE OF THOMAS LAYCOCK



CHAPTER 4

BIRTH OF A NEW CONCEPT

The papers which came from Laycock's pen in 1838-9 were the most important ones of his life; they not only determined his own thinking and teaching but were to help effectively in determining lasting new concepts on brain function and to suggest, in part, a physical basis for behaviour, normal and abnormal. This in turn had theological, social and moral consequences.

Laycock's hysteria papers

Hysteria is one of the most ancient of diseases and in recent years medical historians have written much on the subject describing how ideas on it have varied over the centuries.(1). Laycock's papers were published in the widely read Edinburgh Medical and Surgical Journal. In his time hysteria was a general polysymptomatic condition ; a lucid clinical description being given by Thomas Sydenham (2) who wrote:

The frequency of hysteria is no less remarkable than the multiformity of shapes it takes on. Few of the maladies of miserable mortality are not imitated by it. Whatever part of the body it attacks it will create the proper symptoms of that part. Hence without skill and sagacity the physician will be deceived.

Sydenham then described the symptoms when it attacked various parts; falling upon the head it caused apoplexy leading to palsy, falling upon the lungs, the result was continual coughing, descending to the colon it created pain wellnigh unbearable; falling upon the kidneys, hysteria may cause nephritis or involving the bladder suppression of

urine; hysteria of the stomach would cause vomiting or if the bowels diarrhoea. Even the teeth themselves are not exempt. In case anything had been omitted Sydenham commented "to enumerate all the symptoms of hysteria would be the work of a long day"; however an important sign was that at various times great quantities of limpid urine were voided and this was also a sign of hypochondriasis in males. For Sydenham hysteria was a disease of mind resulting from an ataxia of the nerves.

Robert Whytt followed Sydenham in thinking that hysteria was a disease of the nervous system (3) but in spite of the firm assertions of Sydenham and Whytt, Joseph Rawlin in the same century wrote a Treatise on Hysteria (1785) in which he considered hysteria to be caused by vapours from the uterus floating upwards (4). Dr Pomme in the mid eighteenth century thought hysteria was "the Proteus in its metamorphosis and the cameleon in its change of colours is to express but weakly the variety and bizzareness of the symptoms". A century later Pierre Briquet felt hysteria an ailment "which all authors agree as the epitome of instability" and consisted of many symptoms which defied explanation (5). Sydenham's ideas on hysteria were thus equally valid in Laycock's time.

The initial paper by Laycock dealt with hysterical ishuria (6) and opened by stating much of the aggravated (chronic) form of hysteria was a matter for speculation and the symptoms irregular. He then described two patients from his own experience, admitted under Dr Belcombe, to the York County Hospital who had an obscure form of hysteria characterised by irregular discharge of urine, vomiting and decept. Probably Laycock did what any young doctor would do when finding patients with two rare conditions - seek publication. At the same time he was becoming more interested in generalisations, or as he termed them, principles and laws.

The first a girl of sixteen complained of headache, sleeplessness loss of muscle power, and pain in the back. The abdomen was "knotty", distended, tympanic and painful to the slightest touch. The nav^{el} formed a cul de sac, discharged a fluid which stained the linen and there was a similiar discharge from the ears. Urine was passed in small amounts with difficulty, although at one time after several days of oliguria she

passed three or four quarts in one day and in the latter part of her stay in hospital she would vomit fluid which looked like, and smelt like urine. A catheter was passed on many occasions but usually only very small quantities of urine were obtained. Because of continued vomiting of a urine like fluid deception was suspected; Laycock said he was convinced that the fluid came from her mouth but could not say how it got there. The patient was then placed in a calico sack to the waist and during the period in which she was enclosed there was a troublesome cough with "bloody expectorations", the pulse accelerated and the discharge continued more profusely. On one occasion the catheter became obstructed with a white curdy substance, there was severe pain accompanied by pyrexia which caused the nurse to call Laycock at 2 a.m; he prescribed opium for the pain. Later it was decided to discontinue the use of the catheter and it was found that when the bladder distended it would empty again spontaneously. One day a nurse found the catheter was missing and a few days later Laycock found it beneath the patient's pillow and removed it without her knowledge, the bladder then became very distended and painful so that she admitted that on one occasion she passed the catheter herself and drank the urine which she later vomited. A gradual improvement then occurred and she was discharged.

Deception was for Laycock an integral part of hysterical ishuria, a view in which he did not stand alone. Charcot wrote:

Until recently, I shared the almost general incredibility which prevailed in relation to hysterical ishuria, being indeed prepossessed by the teachings of my master, Rayner, who never lost an opportunity of expatiating lengthily on the various deceptions of which hysterical patients are guilty (7)

The possibility of some of the symptoms, pyrexia, the rapid pulse and the white curdy substance all being due to the use of a catheter was not considered. The second patient was a 13 year old girl who had a similar history of painful micturition, passing small quantities of urine, pain in the back, and a distended abdomen but the passage of a catheter produced only a few ounces of urine. This patient also vomited "saltish

water" which Laycock found when heated in a spoon coagulated and smelt of urine. She also made a spontaneous recovery and was discharged. As these patients were known to each other, Laycock suspected the latter had also practised a deception, although she worked at a Catholic School for poor children and was reported to be of good character and conduct.

Next Laycock made a thorough search of the literature and found 27 cases of hysterical ishuria. These are listed and include one case going back to 1586 and two from the seventeenth century. Not all references were dated but the majority came from the nineteenth century. He endeavoured to classify all these in spite of it being an almost impossible task due to the ever varying forms of hysteria. Erratic discharge of urine occurred under the following headings:

- (1) those with distinct hysterical symptoms,
- (2) those similar to the above but with less marked symptoms.
- (3) Cases of erratic discharge of urine with various other symptoms particularly paralysis.
- (4) Those with total suppression of urine. When this happened death usually occurred in a few days, but if life was prolonged urine must escape by some other route unobserved or a deception had been practised unobserved. The fourth group therefore consisted of long suppression of urine with hysterical symptoms but without obvious erratic discharge of urine.
- (5) This group comprised those in which there was insufficient information to place them in any of the above groups.

The second paper (8) commenced with various cases deemed to be illustrative of hysterical haemorrhage, two of whom were patients at the York County Hospital. To the modern reader these cases are difficult to understand, but in a recent paper on some historical cases of self mutilation in bulimā, Thomas Laycock is quoted. One patient with hysterical symptoms (globus hystericus and syncope) followed Laycock's description of haematemesis following bouts of bulimia (9). Hysterical affections of

the nervous system were next described by Laycock of whom four were patients at the York County Hospital. One of these was transferred to the York County Asylum as her screaming and crying at night caused too much ward disturbance. Laycock visited her in the asylum after a few weeks, where he found her with her head on the table dribbling saliva; she answered his questions with a blank stare. Subsequently she improved and was discharged. The same group of patients contained an interesting section termed "Imitative hysteria" by Laycock; he was called one afternoon to the women's surgical ward on account of sudden illness in several patients which commenced when one young woman with hip disease had that morning experienced headache, retching, sense of suffocation and aphonia. Another patient who went to her assistance soon had a similar condition and then a patient in the next bed and then a fourth patient began to retch and vomit accompanied by loud sobbing. Laycock said he had no idea what was wrong so he sent a note to a senior physician. While waiting his arrival an old Irish nurse told him she had often seen the same events at the lying in hospital in Dublin. Laycock then remembered Boerhaave's cases in the Orphan House at Haarlem and by applying suitable remedies (which are not described) all patients were better in a few hours. Next Laycock proceeded to discuss the dancing mania of the middle ages and then the odd convulsive movements and excitement which occurred when John Wesley was preaching. In all these there was an element of imitative behaviour which resembled the behaviour of mesmerised patients. Various other types of nervous hysteria are described including dyspnoea, aphonia and dysphagia. This instructive paper shows Laycock was on call for all kinds of emergency and was prepared to consult one of the physicians if his lack of knowledge and experience required this.

Laycock's third paper (10) started by noting Sydenham, Boerhaave, Fleming and Pomme all agreed the seat of the abnormality in hysteria was in the nervous system although opinions differed as to the part of the nervous system and the nature of the abnormality. Laycock commented "Our knowledge of the minute anatomy of the nervous system is of little amount and of its physiology we know still less". After

discussing the effects of the ovaries and testes on physical and mental characteristics Laycock grouped all the various organs which may be affected in hysteria into five.

1. Those having a direct physiological relationship e.g. ovaries, uterus and breasts.
2. Those having an indirect relationship with salivary glands, thyroid, oesophagus and teeth. The latter were included as infective parotitis was sometimes complicated by an oophritis and the salivary glands have an anatomical relationship with the teeth. The thyroid gland sometimes enlarged with pregnancy.
3. Those having an anatomical relationship with the reproductive organs, kidneys, urinary bladder and large intestine.
4. Those having a secondary anatomical relationship with those in the first two headings.
5. The encephalon as the organ serving reproductive and other behaviour.

Much of the physiology in the second, third and fourth headings now seems far fetched but Laycock was endeavouring to make a synthesis of the clinical state as described by Sydenham using such anatomy and physiology as he knew.

At the end of April Laycock was writing his fourth paper and entered in his journal (11) that he rose at five a.m. and would do so until the paper was finished in June but new ideas occurred faster than he could examine them. He prayed:

O Father of all, benevolent and gracious, assist my poor
endeavours, enlighten my understanding, direct my thoughts in
the right track and above all may my labours be to the good
of all thy creatures for whom thou hast died and to thy own
glory. Amen.

The fourth paper (12) was a continuation of the third and opens with a consideration of hysterical haemorrhages, the frequency with which various organs were affected depended on the closeness of their relationship with the ovaries. Haemorrhages are also determined by a difference in the blood of men and women, both in water and

fibrin content causing women to bleed more easily than men. No experimental evidence was given for this claim, but Laycock reasoned that in the menstrual cycle the whole nervous system was in an excitable state because of ovarian influences and "the blood vessels assume a state analogous to that in haemorrhagia hysterica". Laycock frequently emphasised the effect of the nervous system on the vascular and he went so far as to consider normal menstruation a form of hysterical haemorrhagia. After a digression into the haemorrhagic diathesis he considered hysteria could occur in males, a view supported by Willis, Sydenham, Boerhaave, Cullen, Conolly and Marshall Hall; Laycock went on to discuss the nervous system relating to hysteria in general. The differing symptomology was traced from infancy through childhood to puberty when the sexual organs and intellectual thought determined a new set of symptoms. The reactions of children generally resembled those of the female in that "facile excitement of mental emotions and convulsions were common to both". Previous to puberty the cerebrum differed from that after puberty, as evidenced by the great intellectual gain in that period and further head injuries in children were generally not so serious as those in adults (figures from Sir B. Brodie were quoted). At the second dentition a difference in the sexes is observed in that the male becomes less excitable than the female, and as evidence for this, the increased incidence of chorea in girls aged 8 to 14 was given. Nearly a third of all cases of hysteria had their origin in some form of emotional upset; extreme forms of emotion were expressed by animals not only with their head but in the more caudal regions, so that the spinal cord and medulla were involved in emotional expression and acts. Local tenderness over the spinal column in hysteria might also be due to spinal abnormalities which caused symptoms; this physical sign was a common one at the time. Hysterical conditions thought to have a nervous and emotional basis were discussed; these included asthma, angina, tetanic spasms, epilepsy due to functional derangement, neuralgia, paralysis of various kinds, anesthesias and loss of vision. Combined movements could be hysterical, such as repetitive movements and emotional acts.

In August when preparing his final paper on hysteria Laycock wanted something special with which to conclude. He had doubts about his tentative conclusions and feared they would draw ridicule and that he would be called a materialist as he would be advocating a physical basis for mind. There were many who considered a physiological explanation of behaviour would lead to atheism and the breakdown of society. However although his ideas were speculative he believed them to be true and they were calculated to advance knowledge and relieve human misery. (13).

The object of this paper (14) was to be the examination of those phenomena considered to be types of hysteria and in which consciousness was involved, namely coma, delirium, spectral illusions and somnambulism. After a long introduction dealing with life, organisation, the nature of diety and a future state, Laycock said this was only a cursory glance and they were subjects to be examined in future writings. The latter part of the paper shows how his thinking on hysteria led to reflex function of the brain.

Laycock argued his case through a series of stages. In the animal kingdom worms had a distinct nervous system with segmental ganglia and dependent tissues. A quotation from Robert Grant reads:

As each segment of tenia is complete in itself, and capable of independent existence, so each segment of the body throughout the helminthoid classes may be viewed as a separate being with its exterior covering, and its muscles and digestive apparatus, its brain and nerves of motion and sensation.

In the higher animals ganglia became more centralised, and the whole organism depended on the functions of the brain. Destruction of part of the medulla oblongata resulted in cessation of respiration and then of all functions, but Laycock thought Mayo was wrong in seeing the medulla as the seat of consciousness.

In the higher animals reflex ganglionic movements illustrated the mode of action of the brain itself. The structure of the brain had been lucidly described by Samuel Solly, but of its functions hardly anything was known; however Laycock felt justified

in assuming that in man the hemispherical ganglia [grey matter masses in the cerebral hemispheres above the brain stem] were the central ganglia of the whole system, and the seat of the mind. Other portions of the brain might form distinct centres and the paired nerves analogous to those in the articulata were obscured by the development of new parts.

All knowledge relating to the brain could not be reviewed, but both physicians and metaphysicians recognised the brain as the organ of consciousness. He continued:

It is in the encephalon, then, that those changes, which are excited by external and internal stimuli are manifest to intelligence: or in other words, consciousness consists in a perception of the changes thus originated in the brain by the forces of matter, yet not in the brain as a whole but especially in the hemispherical ganglia.

Laycock next turned to the work of Marshall Hall whom Laycock first met when he was a student in London. Hall developed ideas on reflex action backed up by experimental evidence and gave an account of earlier work published by the Zoological Society and the Royal Society in the Lancet of 1839 (15).

His experiments led Hall to postulate special nerves with excitomotor properties, the incident excitor and the excito motor, such nerves being independent of sensation and volition. Hall denied the spinal cord was a mere transmitting system as had been thought to be the case in previous ages and contended many involuntary actions such as sneezing, coughing and excreting were examples of his excitomotor system. (16)

The faculty of the will entered into Laycock's steps of reasoning. The voluntary recall of ideas involved reactivation of those changes in the brain caused by the original sensation. The will and attention could alter sensations themselves, e.g. it was possible to will a sensation in a finger by constantly thinking about it .

On the subject of dreams Laycock referred to the philosopher Dugald Stewart, who explained dreaming as arising from the association of ideas without any voluntary control over those ideas, and Stewart's explanation could also hold for the effects of

opium and its action on the will and the brain. The writings of Stewart in relation to Laycock are further examined in chapter seven.

"Spectral illusions" of all kinds could arise by internal excitation. Laycock recalled that once when he was half awake he heard his own name called in his ear but no-one was there. He also remembered a case of Cabanis in which a patient continued to smell pus when no one else could do so. Autopsy revealed an abscess of the corpus callosum. Internal excitations could however be modified by the external and Laycock recounted another of his dreams. He was back in London visiting patients of the Westminster General Dispensary and walking through the narrow alleys of St. Giles where he always breathed with difficulty and he felt he was being suffocated. He awoke to find the bedclothes twisted round his face and obstructing respiration.

Stewart's ideas were then stated in excitomotor terms:

By changing a few terms and adding their explanation derived from physiological facts, with which Stewart was not conversant, it will be easy to show that the excitomotor phenomena of Dr Hall confined by him to the spinal cord, have their analogues in the cerebral hemispheres.

With changes in consciousness, due to action in the cerebral hemispheres, perception and volition were rendered inactive, but excitomotor actions could still arise from external stimuli and this could be witnessed in delirium, somnambulism and hysteria. An act of will on the sensory organs could lead to a motor response and if done repeatedly became involuntary; an example of this was the decrease in the number of mesmeric passes needed to produce a trance in the O'Key sisters.

Considering the peripheral nerves involved in these mechanisms, Laycock said he preferred to adopt the usual nerves as described by Bell and not the incident and excitomotor nerves described by Hall. Further examples of actions, independent of consciousness or the will could be seen in the instinctive actions of animals and concerned with their own conservation and had been described by Prochaska.

The final hysteria paper of forty three pages digresses into many fields and it is not surprising that although the papers as a whole were recognised as authoritative on hysteria, reflex function of the brain was over looked. It is not easy to tease out when specifically looked for.

1 Treatment of hysteria ✓

Laycock wrote little about the treatment of hysteria, although he stated that bleeding was able to produce all the symptoms of hysteria as blood loss acted on the same parts of the nervous system (17). When treating epilepsy proof of the condition originating from a distal extremity was the fact that a ligature placed round the affected limb could prevent both the aura and the paroxysm.(18). Some years later Laycock wrote a paper on electro-galvanism in the treatment of hysteria and moral insanity in women (19). By 1850 the voltaic pile or battery was well known although differences of opinion existed about animal electricity. Schiller described electrotherapy as one of three roots of medical electricity. Its use was being extensively explored in the first half of the nineteenth century and became a popular therapy in the second half (20). Conolly was not very impressed with galvanism for the treatment of hysteria although Gulley used it in two cases of "inveterate neuropathy" with highly gratifying and permanent results.(21). In fact the use of electricity for medical purposes went back to the eighteenth century and was advocated by John Wesley (22). Laycock's paper opened by noting a disorder of feelings, sentiments and affections which when intense and persistent, constituted moral insanity but when of minor degree might be termed cerebral hysteria to which women with certain mental and corporal characteristics were liable. These were not specified but three stages were described; firstly the aetiological stage with general non specific ill health; this passed into the stage of incubation with disorders of digestion, uterine and bowel function, irregular urinary secretion, a dull pain in the region of the sacrum and an irritable temper. This stage was often attributed to hysteria or spinal irritation. Tenderness over the spine had previously been noted by Laycock and was a sign prominent in the writings of Charcot. As the condition progressed the cerebral disorder became more manifest, the temper unreasonable and

the patient difficult to manage. She became fickle, selfish and cunning, and responded indiscriminately to passing ideas. Laycock concluded

and sometimes ideas that arise in the mind are so disconnected that a character of great eccentricity if not actual insanity is stamped upon her actions.

Electro-galvanism was in Laycock's opinion both prophylactic and therapeutic and could be applied to the abdominal or pelvic regions. No clinical details of the treatment were given and the reader was referred to a paper by Dr. Cumming of Edinburgh entitled "On the use of Electrogalvanism in a peculiar Affection of the Mucous Membrane of the Bowels". Cumming had treated mucous colitis with electrogalvanism using an apparatus supplied by Kemp's of Edinburgh. This was used for a quarter of an hour daily and it was found areas of abdominal tenderness altered and finally disappeared (23). Laycock did not state how many patients he had treated with electro-galvanism or the outcome. He did however think there was a great future for medical electricity including the treatment of the insane. An adjuvant in treatment was tar in small doses as recommended by Professor J. Y. Simpson.

Observations on the hysteria publications

The papers on hysteria occasioned very favourable comment. Following the paper on hysterical isuria the British and Foreign Medical Review wrote (24)

On a former occasion we referred to this class of diseases and expressed a wish that the subject were investigated in a philosophical manner. There is none more interesting in the history of physic as contributing some new and authentic material, Mr. Laycock's paper will be useful; it is highly creditable to his zeal and industry.

Following the "Analytical Essays on Irregular and Aggravated forms of Hysteria" the same journal commented:

This is a continuation but not the conclusion of former papers on hysteria, and is marked by the same elaborate research and ingenuity. We refer to it chiefly with a view of recommending it to our readers. It is not susceptible to abridgement.(25)

This is an opinion with which all who tried to make a precis of the hysteria papers must agree.

The Editor of the journal was Dr (later Sir) John Forbes who invited Laycock to write a series of review articles, which were published anonymously. Other favourable comments came from the Senior Physician to the Bristol General Hospital, J.A.Symonds, who said

While recording the contribution to practical medicine I ought not to omit the mention of some papers by Dr Laycock on hysteria. He has not completed his analysis of the phenomena of this mysterious disease, but his essays present so remarkable an amount of research, and so much that is interesting with reference both to the physiology and pathology of the nervous system, that I cannot but take this opportunity of thus advertising them. (26)

Charcot in the second volume of his lectures (27) devoted several pages to hysterical isuria, described as a condition in which there was suppression of urine at the level of the kidney rendering a catheter useless.

In short, of contemporary authors Dr. Laycock, professor of medicine in the University of Edinburgh, is, perhaps the only pathologist who in his writings has given domicile to hysterical isuria. After devoting to this question a series of articles in which he contributed two original cases, Dr. Laycock returns to the subject in his well-known work on the Nervous Diseases of

Women 1840. Everywhere else, if hysterical be mentioned it receives but a passing notice, and not without an ironical allusion to those observers who have been so simple as to gravely accept this pretended symptom.

Mesmerism

When referring to mesmerism the fourth hysteria paper mentioned the O'Key sisters (Elizabeth and Jane) and in a later paper Laycock (28) said they were one reason for his interest in hysteria. At the time of his writing there were a series of articles and letters in the Lancet relating to the O'Keys which attracted great professional and popular interest; Dr Elliotson, Professor of Medicine at University College and Laycock's former teacher, was demonstrating the supposed powers of the O'Key sisters under mesmerism. They both suffered from epilepsy and had previously, at University College Hospital, been under the care of Dr Thompson. On May 10th 1838 (29) there was a distinguished gathering which included several of the nobility, many members of Parliament, two hundred medical men and Michael Faraday. Elliotson said the institution in which they were exhibited was called a liberal institution, yet he had been asked to take the patients on whom the experiments were being tried away from the hospital to a private lodging or hotel.

Various experiments were carried out with Dr Elliotson making passes, and one of the O'Key sisters making trifling remarks before she was restored from her trance by Elliotson blowing in her face. A child was next brought in and shown how to mesmerise the O'Key girl but the child had to make thirty five passes before O'Key was stupified and then only for half a minute. Elliotson proceeded to demonstrate the extra effect of his own body in transmitting magnetism and placed his hands on the shoulders of the child, the O'Key girl then fell asleep on the twenty- first pass and on repeating the experiments the child finally had to make only two passes. When the child was left alone she had again to make thirty-five passes before achieving any result. The O'Key

girl's sister was then brought in who was said to be infinitely more susceptible to the magnetic influence than her sister. Elliotson could mesmerise her merely by pointing at her, or even looking intently.

At the end of the session the first sister had been in a state of delirium for two and a half hours. Dr Elliotson rubbed his thumbs across her eyebrows but she could be restored only to a waking delirium and not to natural wakefulness. Eventually Elliotson speaking close to her ear asked her when she would wake up. On receiving an answer of five minutes she was then asked if she would wake herself, she replied no and that Elliotson must wake her by rubbing her neck. Dr Elliotson then began to pass his thumbs across her neck but as there was no response in half a minute a Mr Wood took over and the subject was fully restored in a few seconds although she seemed wearied and depressed.

A series of articles and letters (30) then followed on the subject of mesmerism culminating in some more experiments performed on the O'Key sisters Elizabeth and Jane at the house of Mr Wakley (31). The first two meetings were conducted wholly by Elliotson which Thomas Wakley did not think satisfactory.

At a meeting on the 16th August 1837 Elliotson said he had found quite astounding results using the metal nickel and suggested experiments be tried. Elizabeth O'Key was seated, a state of "ecstatic delirium" induced and a piece of thick pasteboard held in front of her by two observers. Mr Wakley was seated in front of the girl and received a piece of nickel and piece of lead which he rubbed on to the girl's hands in such a way that from its form or touch it would not be possible to decide which metal was used. First the lead was applied to each hand alternatively and there was no effect; next after a period of time Elliotson gave the piece of nickel which had been in his hand a considerable time so that it was warm to Wakley who also held the lead in his hand so that it was also warmed, the nickel was then used with no obvious affect. The lead and nickel were then applied alternatively and repeatedly without the expected effect. After an interval the subject's face became flushed, and she fell back in the chair, the breathing was rapid and the limbs rigid. Elliotson then suggested that nickel alone

should be used and Mr Wakley be the operator but unknown to Elliotson. Mr Wakley gave the nickel to Mr Clarke who put it in his waistcoat pocket; Wakley then used both hands to touch those of the subject, his fingers held so that none could see what was in his hands, the subject fell back on her chair in a paroxysm. It was then explained to Elliotson by Wakley, in the absence of the subject, how he had deceived him: to which Elliotson replied he could not understand the finding. The following day a large number of experiments were performed on mesmerised water in glasses and gold sovereigns . Both sisters were alternately subjects and asked to identify which of six glasses of tepid water had been mesmerised or which gold sovereign had been mesmerised. Wakley insured all were of the same temperature in touch. All experiments were a failure and Wakley declared "animal magnetism constituted one of the completest delusions the human mind ever entertained."

At the end of the year Elliotson resigned his post at University College Hospital but continued his experiments and public sessions from his own home. Elliotson was, in any case, an unpopular although an intellectually able person and some were pleased to have an extra reason to enforce his departure from the University. He was disliked not only for his 'materialistic' views but his aggressive manner to those who held different opinions. Magnetism and electricity together with vital forces, their interplay and relationship to biology and medicine were to continue subjects of great concern throughout the Victorian era. This was especially true of animal magnetism, hypnosis and later hysteria. Some subjects showed clairvoyance and this was true of Elizabeth O'Key who was used by John Elliotson to diagnose other patients' illnesses. Clairvoyance was also to popularise spiritualism which attracted many clergy and eminent scientists, together with a large popular following of those who wished to have contact with departed relatives and friends. To account for the observed phenomena many hypothetical forces were invoked and Laycock wrote a lengthy review on these in 1851, entitled "Odyle, Mesmerism, Electrobiolgy etc." and was based on reviewing the following books. (32)

1. Researches on Magnetism, Electricity, Heat, Light, Crystallisation, and Chemical Attraction in relation to the Vital Forces by Karl, Baron von Reichenbach. Translated and edited by William Gregory (1850).
2. Letters to a candid inquirer on animal magnetism. by William Gregory (1851).
3. On the truths contained in popular superstitions: with an account of Mesmerism by Herbert Mayo (1851).
4. What is Mesmerism? An attempt to explain its Phenomena on the admitted Principles of Physiological and Psychological Science by Alexander Wood 1851.
5. The Mesmeric Mania of 1851: With a Physiological Explanation of the Phenomena produced A lecture by John Hughes Bennett 1851.
6. Electro-Biological phenomena with a physiological explanation of the Phenomena produced. James Braid.

The first three authors were considered to have a preference for the occult, their object being to prove that astrology, witchcraft, divination, hydromancy, phantasmomancy etc. have a foundation in philosophy and fact. All these were deemed to be determined by a force universally present in creation termed "od" or "odyl". By this force converse was possible with departed spirits and events, past, present and future described. Mr Mayo and Dr Gregory were disciples of von Reichenbach, a German metallurgist and chemist, whose researches with reference to mesmerism were critically examined. The honest enquirer, Laycock thought, had the right to be heard even if his views were novel and startling, but the phenomena described and the inferences deduced must be subject to a critical examination. Reason must be appealed to and objections met.

Von Richenbach held that people varied in their sensitivity when a magnet was passed down their bodies and all those who felt some effect, a quarter or a third of the population he termed the sensitives. The power of exerting this action belonged not only to magnets but to crystals, which acted along the line of their axis, to heat, friction, solar

and stellar rays, chemical action, organic vital activity of plants and animals but especially that of man, and finally the whole material universe. The cause according to Von Richenbach was a particular force, embracing the universe yet distinct from all other forces, the 'odyle'.

In all the first three works Laycock deemed it necessary to differentiate between the phenomena described and the explanation of them. In fact Von Reichenbach had never experienced odyle himself, the "sensitives" merely told him what they have experienced. Moreover since he claimed the sensitives had a peculiar disposition of the nervous system he ought to have attempted to conduct some inquiries into the nervous system, although everyone knew of the difficulty in the scientific enquiry into disease by observation.

Many experiments referred to magnetic light, light which sensitives could see and was diffused by odylically excited bodies. These sensitives had often been shut in a dark room for two hours, but Laycock remarked some people when shut in complete darkness for two hours could be persuaded to not only to see visual phenomena, but to hear sounds, smell smells and feel non existent objects without reference to odyle, chrystals or anything else. With reference to a woman who was mesmerised and became insensible Reichenbach wrote

When I performed the same passage with my large rock crystal the recall was the same. But I could produce the very same effect by using instead of magnet or crystal my hands alone. The peculiar force (shall we call it crystalline) found both in magnets and crystals must therefore also reside in my hands.

Mayo and Gregory both tried to establish animal magnetism as a phenomena of the 'Od' forces for which Mr Mayo had devised an "Od" meter, (not described) but Laycock notes that some gentlemen from the U.S.A. demonstrated certain phenomena which they termed "electrobiological" and that all these results like those of Reichenbach were subjective. At the time public exhibitions were being given in London and Edinburgh by persons from America which Laycock says only acted by way of the

subjects' attention and will. The thought reading was accomplished by the power of suggestion.

After the long and detailed criticism of the first three works it was noted that Braid performed a number of experiments to the complete overthrow of those of Von Reichenbach. In looking at the methods which caused the condition designated by Braid as hypnotism, Laycock said they were all calculated to excite attention, a point elucidated physiologically by Braid and Wood, who also noted the effect on the will. Bennett also commented on the effect of attention and the will. The reviews were published anonymously but Laycock recalled his own views expressed in Nervous Diseases of Women whereby attention may be voluntary or involuntary. During an act of voluntary internal attention when the mind was occupied with its own thoughts, the condition of the hemispherical ganglia were changed in a way which could alter consciousness and volition in a complex fashion and effect both motor and sensory symptoms. Elliotson's book on Human Physiology was quoted on the reflex of sneezing when he (Elliotson) observed he had amused himself by attending to the sensation of sneezing and bringing himself to sneeze. These changes in cerebral function could account for somnambulism, delirium, spectral illusions, catalepsy, hypochondriasis, dreams, anaesthesias and perverted sensations. The so called electrobiological, magnetic and odyllic phenomena all depended upon laws and principles of physiology and mental philosophy.

By 1851 William Carpenter had taken over the post as editor of the British and Foreign Medico-Chirurgical Review and as such amended a small part and suppressed quite a large part of Laycock's paper. This was due to their respective claims in relation to reflex function of the brain, and lack of mutual understanding, but the original parts can still be read in manuscript form (33). Laycock mentioned his own name several times and his views on reflex function elaborated in relation to dreaming, somnambulism, mesmerism, insanity and intoxication.

Two examples from the suppressed material however, are of interest. The first refers to an epileptic subject who during a fit continued to carry out the actions he was

performing before the fit. Years later this case would have had forensic significance when discussion took place whether automations were related to the subject's preictal physical activity or whether the subject's thoughts were more important than his physical actions.

The second example was of a woman who was about to undergo painful surgery but before Laycock and others entered her room she could be heard praying fervently. Chloroform was administered and when the skin was insensitive the patient continued in fervent prayer using the same words as previously. Chloroform had come into use only some four years previously following the work of J.Y.Simpson, and its use spread rapidly without involving clinical trials or a licence. About 1851 the powers of clairvoyance were being invoked by spiritualism and the sect's beliefs and practices introduced into this country.⁽³⁴⁾ Eight years later Laycock wrote a paper on this under his own name ⁽³⁵⁾ entitled *Demonology and Divination* - a paper which showed a remarkable breadth of reading and depth of knowledge. Foretelling the future in this world and the next was as old as mankind and this has been accomplished both by natural and supranatural means. Some of the old natural knowledge came from vague unsystematised, unscientific methods, such as the old shepherd who knew the coming weather. Prophecy and divination have been described among the ancient Egyptians, Chaldeans, Persians and Romans together with the use of numbers among the ancients, and the importance they attached to the number seven. Foretelling among the Greeks was covered and it is mentioned that the Greek word for soothsayer is *mantis* which was derived from the same root as *mania*.

Divining girls also known as python priestesses or sybils were discussed together with the various methods of divination such as dreams, departed spirits, a divining rod, crystals, second sight etc. An important example of the way in which things had changed was from divination to philosophical induction from history. Laycock then gave his own work a boost and said his work on '*Proleptics*' illustrated the inductive methods of forecasting the future for man.

Some of the Victorian clergy hoped that spiritualism would give religion and Christianity a firmer foundation but there were also those clergy who considered the communications obtained were from the devil. Laycock was an optimist and saw a better day dawning, Christian philosophy would redeem the age but it was important that their own time should not be corrupted by useless and unprofitable divination.

In the late nineteenth century there were eminent scientists who joined the Society for Psychical Research in an unbiased way and some of these such as Crookes and Lodge veered towards spiritualism. William Carpenter like Laycock held no brief for spiritualism and was more vociferous in denouncing it.(36)

Hysteria, mesmerism and their suggested neurological basis had led to implications that were to be of great concern in Laycock's lifetime and subsequently.

Largely due to the influence of James Braid.(1795-1860) a Manchester surgeon, the term mesmerism and thoughts of special fluids or forces dropped from use, and the term hypnotism became general. The great Charcot (1825-93) Professor of Medicine in Paris, brought hypnotism to the fore, described various stages and thought some of these were especially marked in patients with hysteria. Bernheim (1840-1919) differed from Charcot could not confirm his findings, stressed suggestion in hypnotism and considered no special relationship with hysteria existed. The claim that unconscious memories could be retrieved under hypnotism constituted one of the factors which led to the development of psychoanalysis. (37)

Reflex Function of the Brain and the birth of Neuropsychiatry

On his return from Göttingen Laycock published his first book A Treatise on the Nervous Diseases of Women: Comprising an enquiry into the nature causes and Treatment of Spinal and Hysterical Disorders (38) which he says in the preface may be considered a second edition, revised and improved since the series of articles on hysteria. The word spinal was applied to hysteria as it was considered some parts of emotional

expression were associated with, as previously noted, the spine and spinal reflex action. There were however some additions to the hysteria papers such as views on a boarding school education for young women. A trend in both Laycock's hysteria papers and in his Nervous Diseases of Women is that he moved away from abnormalities of the uterus to ovarian influences. The phenomena of hysteria occur mainly in women in the childbearing period of life and sexual characteristics in the female and reproduction; a patient was quoted in which removal of ovaries caused the voice to deepen and hair to appear on various parts of the body. Cabanis considered the menses to be excited by a humour of the ovaries and Laycock assumed that it was through the ovaries that the mental phenomena of hysteria were generated as well as the physical. Compared with modern texts, there is an excessive amount of discussion including that of a philosophical nature which would seem out of place in a clinical book. This was not extraordinary at the time and Laycock explained this by writing:

I have often thought that treatises on the practice of medicine professing to be free from theory, and to contain nothing more than a description of diseases and the methods of treatment, are of questionable utility. The condensed style in which they are usually written admits of no detailed exposition of the principles laid down or the facts from which those principles are deduced. The writer, consequently, appears to dictate, rather than state an argument; to be the occupant of a professorial chair, rather than a fireside companion.

Laycock justified a philosophical rather than experimental approach when he stated in the same preface :

He [the scientific physician] turns his attention to the material action of mind and matter, that metaphysics may become a tangible and practical science, subservient to the advancement of human physiology, that human physiology may extend the powers and range of medicine. To medical practitioners of this class,

the daily routine of their professional labours can never be what Dr Samuel Johnson defined it - 'A melancholy attendance on misery: a mean submission to peevishness: and a continual interruption of pleasure'. They feel, it is true, that they have the melancholy privilege of studying man dissected by infirmity and anguish; but also that they are thus enabled the better to perform their duty and to aid him in the time of his distress.

This is in keeping with the feelings written in his student days in London when Laycock showed himself to be sensitive to the patient's sufferings, and his keenness in linking metaphysics with physiology. Although this was a topic of the day it was for him a way of coming to terms with his own inclination and at the same time carrying out professional duties.

The volume certainly stated more clearly Laycock's views on cerebral reflexes as Chapter IX was entitled "The instinctive actions in relation to consciousness: - the brain subject to laws of reflex action." This started by referring to Galen who first demonstrated that instinctive actions were at least partially independent of experience and then proceeded to recall the work of Unzer and Prochaska.

John Augustus Unzer(1727-1799) was born in Halle and studied and practised medicine in that City. He greatly admired and defended Stahl who taught in Halle. George Prochaska (1749-1820) graduated from Vienna and eventually became Professor of Anatomy, Physiology and Eye Diseases at Vienna. Like Unzer he had a special interest in the nervous system and the *vis nervosa* postulated by Haller. Laycock claimed to be the first to direct attention to Unzer's work (39). In his article reviewing works by Unzer and Prochaska, Laycock stated his attention was drawn to Unzer when studying Prochaska and he was struck by his (Unzer's) lucid views and close reasoning (40). Unzer showed that irritation of a nerve excited movements "independently of the will or the power of the soul" and Prochaska described movements which could be excited by external stimuli without the need of consciousness or the will. Laycock wrote:

Why does a chicken or a young partridge with the shell still attached to its tail peck at a spider or a grain of corn? Or why does the calf of a tame cow by a wild bull exhibit as soon as it is born an unusual ferocity? No-one will assert it learns it from its dam.

There can be no doubt that although cerebral reflexes were first hinted at in Germany, Laycock was aware of this and gave credit to the authors concerned.

Gall had extended Unzer's and Prochaska's views on the instinctive to the passions (joy, sorrow etc.) and stated why were not excited by the will but were felt before the individual had so much as dreamed of them. Laycock wrote:

The importance of these doctrines is apparent. They corroborate the truth of the proposition already laid down that the cranial ganglia, although the organ of consciousness are subject to the same laws as those which govern other ganglia, the diffused nervous system of animals and the vital mechanism of vegetables. In short, that the passion and the movement are dependent upon them as laughing, singing, sobbing: the instinctive feeling and their conjoined movements, from those of epilepsy and chorea down to the retraction of the foot by a decapitated frog are seated in the same grand division of the nervous system and dependent upon the same general laws.

The chapter ends with the observation that an essay on the transmission of instinct based on facts and written honestly and seriously would be instructive but many would certainly consider it dangerous to conceive that mental acts were only the result of vital machinery excited by physical agencies. The third part of the volume attempts to give practical application to what Laycock termed his doctrines. These included cutaneous neuralgiac spinal tenderness, spinal curvature and various cardiovascular conditions.

One surprising comment in the introduction to Nervous Diseases of Women was "With respect to the contents, I had had access to comparatively few books". Yet there

are one hundred and thirty eight references and a detailed and learned introduction to the subject of hysteria. The York County Hospital at that time had a library for medical staff, and Laycock made very good use of it in his capacity of librarian, but it is very likely he had access to other libraries. The Yorkshire Gazette announcing the opening of the York Medical School (41) contained two notices about libraries. Firstly the Dean and Chapter of the Minster announced that any gentleman resident in York could have the loan of books from the library which contained over 6000 volumes of which only one half were theological. It contained a good collection of classics and ancient medical authors. Secondly the laying of a foundation stone was announced for a new subscription library which was to house one of the best libraries of its kind in the north of England; it included British and foreign works on all subjects. These libraries would certainly have been available to Laycock and it is likely he made use of them. Nearly a year after the publication of The Nervous Diseases of Women Laycock wrote in his Journal (42):

I have published my treatise on Nervous Disease. It appeared in November last it has gone through the hands of the critics with some credit but sells badly.

Possibly the ordinary practitioner would have preferred a more practical volume on female diseases and not one confined to hysteria.

It was Laycock's paper "On Reflex Function of the Brain" (43) originally read to the British Association and later published which led to his being recognised as one of the most important contributors to clinical physiological theories of the time. This paper began by noting that some four years had passed since he first suggested the brain was subject to reflex action and says he was led to this opinion by the fact that anatomically the cerebral ganglia were a continuation of those in the spinal cord and by analogies in lower animals which showed an anatomical continuity from the lowest to the most advanced species. Analogy formed a basis for his thesis.

If the cerebral ganglia be but a higher development of the spinal, the medullary, and cortical substance must correspond to

the white and grey matter of the cord, and if it be acknowledged (as has indeed been proved beyond question) that a combined action of sets of muscles exhibiting a design of conservation may be developed in the spinal cord without volition, how can we deny the same qualities to the encephalic ganglia or in other words to the cerebral hemispheres and the connection?

The next sentence is of importance in showing how Laycock connected reflex behaviour and the association of ideas neurologically.

We must consider then each half of the encephalon as consisting of two tracks of cortical, and two of medullary substance; the medullary associating ideas and combining muscular movements; the cortical conducting impressions to the grey matter, giving rise to sensation and perception and hence to the muscles exciting motion.

The purpose of this paper was to make the situation clearer. An account of Marshall Hall's teaching on spinal reflexes was then given. followed by a discussion of hydrophobia in which reflex spasm may be initiated not only by drinking, but by the sight of water where the afferent side of the reflex arc arose in the retina, and even by the idea of water when a drink was suggested to the patient verbally. These must all have involved the brain in reflex action; the posterior grey matter or its analogue is seen as the seat of associations and a train of ideas. Because at the time little was known of the detailed anatomy and function of the brain, beyond the differentiation into white and grey matter, the posterior grey matter was selected on phrenological grounds. Laycock asked why it was that Flourens could obtain no motion as the result of irritations above the corpora quadrigemina and the reason was, said Laycock, the irritations used were of an unphysiological nature. Every nerve required its own particular stimuli and every irritation must match normal excitation.

He suggested two ways of examining central excito motor phenomena, firstly by means of narcotics circulating through the brain as described by Marshall Hall, and

secondly by analysing the phenomena when there were functional derangements of the encephalon. Laycock then described clinical cases which he considered illustrated reflex action of the brain.

A young married woman, a patient of Mr. Wood, started to experience pain in the right side of the face, in the teeth and temporal regions. The pain then became associated with spasms of the eyelids and the face; these then developed into spasms of the whole right side which would last for some ten minutes. In a day or two the spasm progressed, so that she would leap about striking the furniture or door violently with her hand. Again the signs changed and the next day she would step only on joins in the flagstone floor and finally the movements changed to a dance. The patient was thought to be suffering from a disorder involving reflex function of the brain.

Another interesting case was described which was seen by Laycock at the York County Asylum. The subject was a 44 year old severely mentally handicapped male who would hold a stone in his hand and continually move as if waltzing. Laycock enlisted the help of the resident medical officer to time the stereotyped movements and it was found that twenty steps were regularly performed in fourteen and a half to fifteen seconds. It would thus appear that Laycock's approach was, in this instance, a scientific one adding measurement to clinical observation. The concluding clinical cases referred to unprovoked laughter or weeping in hemiplegic patients which was also thought to be caused by abnormality of the cerebral reflexes. An appendix then followed giving further comments on cerebral reflexes. Muscle tone was a cerebral reflex and reflexes could diffuse or irradiate; understanding the substrata for these irradiations, Laycock said, must be based on a knowledge of the central nervous system. Further the association of ideas, like the association of movements, was to be found in the reflexes of the brain; other clinical manifestations may be found in the insane, the dreamer or the delirious.

Laycock ended by stating physiological knowledge and science did not lead to scepticism and irreligion but to rational faith, a belief which was to govern Laycock's thinking and writing throughout his life.

In his paper Laycock thus gave a sensible and concise account of his reasons for extending the reflex concept of Marshall Hall into the cerebrum in spite of the vast difference between the simple special reflex arc and the complex behavioural reflexes of the brain. Reflex action is given as a general function applicable to human and animal behaviour, a conclusion arrived at by the study of comparative anatomy and the "genetic" approach whereby the function in simple organisms could lead to understanding of more complex organisms. Nearly all of Laycock's later ideas on the subject can be seen in this communication in embryo form and the basis of his thinking must have been laid in the period of 1838-1844.

Later Laycock recalled that Dr Forbes sent the paper in November 1844 to Dr Carpenter for comments;(44) he replied that reflex function of the brain referred to a class of action he had already distinguished and subsequently referred them to the ganglia of special sense. He did not apply the term reflex as he thought it best to restrict that term to the spinal cord but he did point out the immediate dependence of motion on stimulation.

Forbes showed Carpenter's letter to Laycock who prepared an addendum to the paper. This was not required and the paper was published in its original form.

Most of the comments on Laycock's paper were favourable but the Lancet of 1845 (45) contained a correspondence between George Combe, Professor John Reid and Laycock. George Combe was a well-known Edinburgh phrenologist, who lectured on the subject at his own home and was one of the founders of the Phrenological Society which published the Phrenological Journal. John Reid was an anatomist who at one time lectured extramurally in physiology at Edinburgh and in 1841 was appointed to the Chandos Chair of Anatomy at St. Andrews University.

Laycock, George Combe and phrenology

In addition to the published correspondence there is a collection of manuscript letters between Combe and Laycock in the National Library of Scotland. A letter from Laycock to Combe dated 26th March 1845 thanked Combe for his translation of Gall on the cerebellum and continued with a phrenological, neuroanatomical and physiological discussion. He concurred with Combe on the connections between the brain stem and spinal cord as these agreed with Langenbeck's plates. Laycock recalled that when he was a student and a resident at the York County Hospital he took such opportunities as presented themselves to trace the fibre strands of the convolutions but his work was never satisfactory.(46). One wonders whether Laycock was doing this work whilst undertaking the mammoth task of reading and writing on hysteria.

It is possible that an earlier part of the correspondence might well be missing, as in his final paper on hysteria, Laycock severely criticised Gall's view on the cerebellum. From ancient times the cerebellum had been seen as the organ of sexual drive, a view held by Gall leading to the cerebellum becoming known as the "organ of amateness" to British phrenologists. Laycock contended that the natural history of the development of the cerebellum, its anatomical connections and anatomy showed it was a compound organ as was the cerebrum. The cerebellum was connected with the antero-lateral and posterior columns of the spinal cord inferiorly, and superiorly with the posterior lobes of the cerebrum and the tubercula quadrigemina. Detailed neuroanatomical description was then given according to Samuel Solly but the nomenclature is different from that of today and in places difficult to follow. The "processus e cerebello ad testes" did not have reproductive function but was the "oblique intercerebral commissure" which connected the cerebellum superiorly with the "optic thalamus" and the "optic quadrigemina". The cerebellum was connected with the involuntary system and in some way in hysteria.

Although Laycock agreed generally with the principle of phrenology that the brain was the organ of mind, he had doubts about faculties and their corresponding

anatomical sites, as they failed to explain psychical phenomena; he looked in vain for an anatomical connection between the optic nerve and colour or between the auditory nerve and tune and time. Laycock then went on to discuss the association of male hair and sexual instincts in man, sexual instincts in mammals and birds and the function of ovaries and testes. Was there, he asked, any connection between the phrenological organs, the cerebellum and ovaries and testes? Even when this knowledge was acquired the phrenological nature of consciousness and the will, of perception and voluntary action would have to be determined and the anatomical basis of their connection with the brain as the organ of mind. The influence of the "philosophical" or "transcendental" anatomists on Laycock again appeared as he said he saw no hope for acquiring such knowledge except by starting with the lowest form of animals. There is a note at the end of the letter presumably by Combe saying "connections between parts of brain, nerves and feelings not sufficiently established, e.g. man in love writes poetry but fights rivals".

Combe replied he thought that they had a common basis which would render discussion profitable (47). He also at one time could never trace connections between brain regions in unprepared specimens but if the dura and pia were stripped off and the brain placed in whisky for four weeks, then dissected with the handle of the scapel from the medulla upwards and then the fingers used to pull the hemispheres outwards from the top of the corpus callosum. there was a clear view of the longitudinal commissure (cingulate gyrus). Combe thought these fibres were part of a connection between the anterior part of the brain and the spinal cord. He agreed with Laycock that knowledge of the minute anatomy of the brain was very difficult but not so difficult as Laycock appeared to think. Combe then considered connections between the optic nerve and the organ of colour; the way he viewed this was the fibres of the optic nerve could be traced as far as the superior corpora quadrigemina and he thought they then went to all parts of the convolutions by means of the longitudinal commissure. Combe was initially a writer of *The Signet* and had some training in law, but he explained his anatomical knowledge by saying he attended lectures in physiology by John Reid when he was in

Edinburgh and that he intended to write to him asking whether reflex action of the brain was consistent with its structure.

Laycock wrote in response that he would be happy to learn Reid's views and although it was not easy for him to obtain brains in York, when the opportunity presented itself he would dissect as Combe suggested.(48) A long letter from Combe in April reported Reid as saying that spinal reflexes were different from the emotional or cerebral. This was a fundamental point for Laycock and one on which he differed from Reid. The correspondence became involved as in the beginning of June it was sent by George Combe's brother Andrew to William Carpenter without George Combe's knowledge. Carpenter added a note saying the seat of the emotions was in the 'ganglia of special sensation' but Combe found Carpenter's views at variance with his own. He (Combe) did not know what was meant by 'ganglia of special sensation' and in any case Carpenter showed contempt for Combe's views (49). The ganglia of special sensation problem was later to be explained by Laycock. Willis had stated "where the corpus callosum is thought to end there the medulla oblongata begins". Subsequently anatomists described three diversions of the encephalon, the cerebrum or hemispheres including the corpus callosum, the cerebellum or little brain with its crura being the head of the spinal column and the medulla oblongata which went from the corpra striata downwards. Formerly the medulla oblongata was considered to be the point of origin of all cranial nerves and through its continuation into the spinal cord to all parts of the body. In this way the medulla oblongata was thought of as the sensory commune but this view disappeared with the advance of Gall's views and the medulla oblongata above the pons varolii was considered part of the cerebrum. Dr Carpenter however revived the old ideas calling the sensory commune the sensory ganglia. (50).

By June 25th, they had agreed on publication and Combe had written to the Lancet. On 30th June Combe wrote to Laycock with the news that Wakley would publish the correspondence but as he was about to depart for Germany he relied on Laycock's judgement to prepare the proofs but they were not to be published without Reid first seeing them.(51). The correspondence was published as arranged .

The published letters which are a variation on the manuscript letters opened with Combe noting a paper by Reid on decussation of the pyramidal track and asking whether there were structures in the brain analogous to those of the spinal cord and concerned with reflexes. He recognised instinctive actions but he wondered how central these influences reached the anterior column of the spinal cord. He knew intellectual faculties resided in the anterior central lobe, and the action passed through the corpora striata, cerebral crura (cerebral peduncles) to the pyramids. He also knew the middle and posterior lobes were connected with sensation but did not know how phrenological organs such as self esteem fitted in. However fibres for such a purpose must exist. Reid agreed with Combe and thought the anterior ascending fibres went to phrenological organs; he considered Laycock's paper to which Combe referred very deficient in some respects in that the excito-motor actions of Marshall Hall were not sufficiently differentiated from sensational and emotional movements. Reid objected to the way the term reflex was used by Combe and Laycock to designate excito-motor movements which differed from many classes of action under discussion in which sensation was an important part, true excito-motor movements did not require the presence of a brain for their manifestation. A lengthy reply was given by Laycock to the various issues; firstly he commented on excito-motor actions not requiring a brain. This was only partly true as when impressions were conveyed by a cranial nerve the brain was certainly involved. Laycock had long puzzled over the sequence advocated by Reid, impression, sensation, emotional acts, but clearly in lower animals a brain was not required for some acts which could be called emotional, as they could be elicited when the brain was removed. Carpenter was quoted as agreeing with Laycock that sensation was the consciousness of an impression. True to the principles of transcendental anatomy Laycock said both Combe and Reid were looking at the wrong end of the scale when considering instinctive and emotional actions and he gives his own definition of an instinct.

An inward excitement to movement having a definite object and thereby exhibiting design but independent of reason.

Instincts were part of the general law of design but emotions were seen in a wider context. Love, honour and moral incentives were emotions of the intellect but related to instinct. As Laycock put it "the automatic acts pass insensibly into the reflex, the reflex into the instinctive; the instinctive are quasi-emotional, the emotional intellectual."

Subsequent letters showed that neither Reid or Combe appreciated Laycock's views. Reid wrote:

I perceive that Dr Laycock renounces the brain as the organ of consciousness, for he there states that neither cerebral ganglia nor sensations are absolutely necessary for the production of emotional muscular movements.

The definition of emotion presented a considerable stumbling block as Reid could not see how "the organisation of an individual could be the seat of the emotions of fear and anger without the individual being conscious of them." He did not think movement in a decerebrate animal could be termed emotional. The definition of sensation also caused confusion as did its place in reflexes. Combe wrote:

a sensational movement receives this name in my nomenclature because it is preceded by a sensation. What I meant to say was that three causes may co-exist of the same movement, a reflex, a sensational-emotional and a voluntary.

When Laycock stressed that all reflexes were basically the same and by separating these from conscious mental events he set the stage for psychophysical parallelism which was later to be a very influential view.

A letter from George Combe to Laycock dated 21st September 1857 (52) was a reply to Laycock who had been requested to write an article on phrenology for the eighth edition of the Encyclopaedia Britannica and he asked if Combe would co-operate with him in writing it. This Combe felt was impossible as from a careful reading of Laycock's writings they differed so widely on fundamental points. Evidently they had moved further apart since 1845. In these circumstance he suggested Laycock should find a person to write it with who was thoroughly and practically acquainted with

phrenology. However Laycock did write the article himself (53) which opened with the principles of phrenology as Laycock saw them. These were 1) Brain and mind are inseparable in this world, 2) the brain is the immediate organ of mind, 3) although the brain is a double organ the two halves normally function together, 4) phrenology affirmed that there were distinct mental faculties and that each had a corresponding organ on the hemispheres. The idea of plurality of functions was accepted and Herbert Spencer was quoted:

No physiologist who calmly considers the question in connection with the general truths of science can long resist the conviction that different parts of the cerebrum subserved different types of mental action. Localisation of function is the law of all organisation whatever.

A detailed description of the arrangement of organs of faculties according to phrenologists was given, but Laycock doubted these. Among the many reasons given for discounting phrenological practice were the bony configurations of the skull might be influenced by the thickness of the bone, the degree of frontal sinus development and pathological conditions such as hydrocephalus. Moreover the size of the faculty may not equate with its power and in old age the brain may atrophy without corresponding changes being made in the skull. Changes in the composition of the blood could markedly affect faculties, especially if substances such as alcohol or opium were present. In conclusion tribute was paid to George Combe who had recently died and who in 1845 "applied Dr Laycock's discoveries to the elucidation of modes of action of the cerebral hemispheres according to phrenological doctrines." A quotation was given from Elements of Phrenology substantiating this:

The ganglia of special sensation which receive the impressions of the nerves of sense, transmit them to the organs of the mental faculties situated in the cerebellum and in the convolutions of the brain, and the impressions produce different phenomena corresponding to the particular portion of the brain the impression excites.

In addition to recognising reflex action of the brain Combe was also using Carpenter's views of the ganglia of special sensation although he stated in the private correspondence quoted he did not know what these were. Laycock ended by stating that phrenology was only an art and every experienced physician found that with age he was less enthusiastic about the certainties of youth.

It is significant that although not supporting the faculties of phrenology, Laycock did accept there was localised function in the brain associated with reflex action and functions could be modified by the blood.

William Carpenter and Cerebral Reflexes

A contemporary of Laycock who also became interested in brain reflexes, evolution and the need to harmonise these with religious beliefs was William B. Carpenter. Carpenter also started his medical life as an apprentice and had the unusual experience of accompanying his master to the West Indies. After some preliminary work at the Bristol Medical School he entered University College, London in 1833 where he met Laycock (54), and qualified M.R.C.S. and L.S.A. in 1835. He then proceeded to Edinburgh University where he did physiological research and eventually graduated. His prize Thesis of 1839 dealt with the comparative anatomy of the reflex arc which was applicable to animals in general. A basic outline of the spinal reflex was given, an afferent nerve ending in a ganglionic centre and an efferent nerve originating in like manner. Carpenter's main work was at University College, London where he was Professor of Forensic Medicine and Registrar of the University of London. He was throughout his life a prolific author and produced various volumes on human physiology. From 1847-52 Carpenter was editor of the British and Foreign Medical Review for which he also contributed many articles on a wide range of subjects.

Carpenter was concerned with many social issues of his day, especially alcoholism, and remaining faithful to his early religious training, he was a member of and organist at the Hampstead Unitarian Church (55).

One issue on which Laycock was sensitive was his priority in describing reflexes of the brain and an account of this was given in his work Mind and Brain (1st edition). His address to the British Association for the Advancement of Science and his paper in the British and Foreign Medical Review 1845 (56) were published because the chapter in his volume Nervous Diseases of Woman entitled "The Brain subject to the Laws of Reflex Action" had attracted little or no attention. Laycock was surprised when William Carpenter hinted at plagiarism as he (Carpenter) considered that he had indicated a class of movement dependent upon stimulation which was in effect the same as Laycock's law of reflex action. Differences of opinion on unconscious cerebration and priority for suggesting reflex function of the brain are discussed in Chapter 7 when considering the appendix to the first edition of Mind and Brain. Mesmeric and clairvoyance matters continued to engage public attention and in 1851 Carpenter invited Laycock to write on the subject including the force of 'od' postulated by Von Reichenbach and previously discussed. As a result of their differences of opinion Laycock invited Carpenter to visit him in York. This he did in April 1852 when they discussed their ideas on brain reflexes and Laycock showed Carpenter his papers. In December 1856 the fourth edition of Carpenter's book Principles of Human Physiology (57) appeared, the section dealing with the functions of the cerebrum had been greatly expanded and there was a footnote referring to Laycock's 1845 paper. In 1874 Carpenter further expanded cerebral functions into a volume in its own right, Principles of Mental Physiology. An unpublished correspondence of Laycock and Carpenter on priority for cerebral reflexes is reported in Chapter 9.

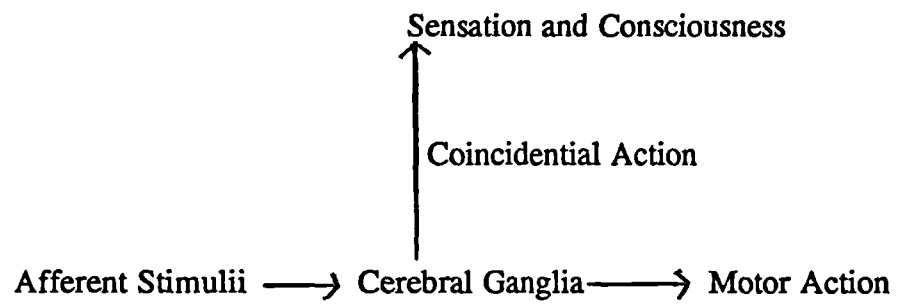
For Carpenter involuntary actions took place because of sensations or even ideas. For Laycock they were coincidental as was consciousness itself.

Their differing views may be summarised diagrammatically

Carpenter

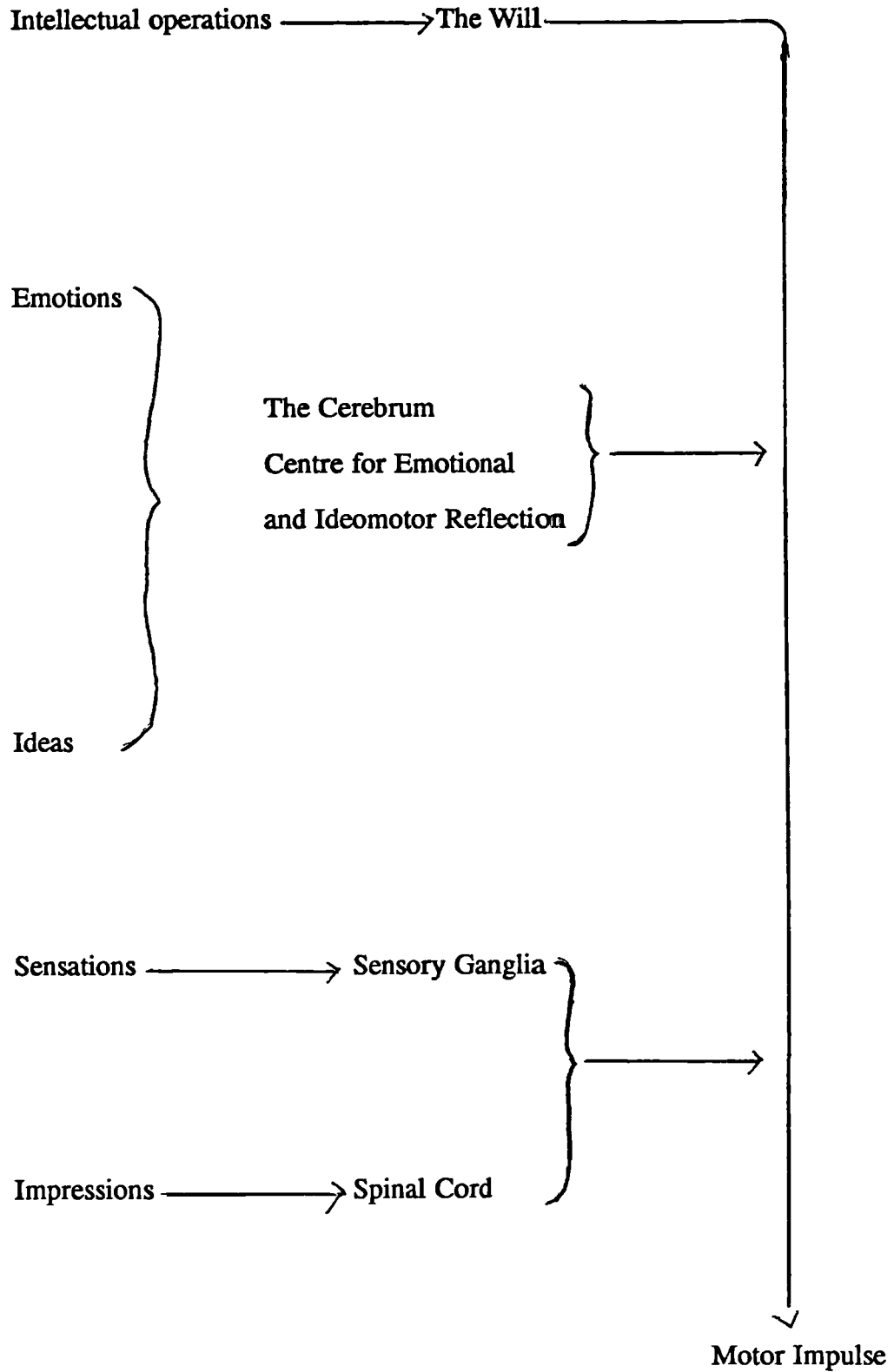
Afferent Stimulii → Sensory Ganglia → Sensation → Motor Action

Laycock



The clearest description given by Carpenter of the sensory ganglia reads the most important group of commissural fibres is that which connects the sensory with the hemispheric ganglia; that is which radiates from the thalami optica and corpora striata to the striatum of grey matter which forms the convoluted surface of the cerebrum (58).

Carpenter gave his own diagrammatic representation of reflex action and the place of the will in 1865 (59). This was:



Laycock's views have been contrasted with those of Carpenter by several recent authors including Jacyna (60) Danziger (61) and Smith (62). Laycock often wrote of these differences himself. Carpenter also agreed with a zoological approach to understanding the nervous system involving transcendental anatomy and physiology but contended there was a discontinuity between man and the rest of the animal kingdom. The cerebral ganglia were not only ganglia acting reflexively, they were also the agents by which an immaterial principal acted. Man was thus different in that his cerebral ganglia were endowed with a spiritual power that gave him control over his impulses; this vital entity was a property of matter in a certain state of organisation. The mental state was essential for Carpenter in separating reflexes from voluntary action; it was the will, a spiritual dimension which gave man control over his passions and actions making him distinct and special from the rest of the animal kingdom. Central to Laycock's thought and writing was the belief there was no discontinuity between man and the rest of the animal kingdom. The transition of structure and function is a gradual one consequently no strong line of demarkation can be drawn between manifestations of its various functions. The ways in which Laycock uses the word "intellectual" were complex. The will was a state of consciousness and consciousness a manifestation of cerebral activity. The differences of opinion about the will and consciousness between Carpenter and Laycock were to lead to different practical approaches in relation to problems in which they were both concerned, alcoholism, forensic medicine, social deviance and education.

As already noted Laycock's first mention of reflex action of the brain was in 1839 before his stay in Göttingen but he was already familiar with the writings of Unzer and Prochaska and claimed to be the first to draw the attention of others to their works in 1847.

Unzer deduced there must be afferent and efferent pathways as the only way to explain reflexes but neither anatomy nor physiology could determine the question "for it is so microscopically minute as to escape the cognisance of our senses". Although Unzer was unimpressed with the importance of the cortex, he recognised old age or head

injury could impair one faculty and not another. Prochaska questioned whether each division of intellect occupied a separate portion of the brain and he thought such was the case (63). Spillane, quoted above, says such comments do not take us further than did those of Willis a century before.

This was not the view of Laycock who wrote:

J.A.Unzer, whose Erste Grunde is still the best work of reference on the subject and still unapproached by modern physiologists. It was Unzer who first systematically showed the identity of reflex phenomena with those that are instinctive and emotional and explained the share which the states of consciousness, termed pleasure and pain, have in all these excited acts. He also, of all neurologists has most successfully made these doctrines elucidate the highest mental phenomena.

Prochaska's 'commentaries' are but a full summary of Unzer's views with the more metaphysical and really the more important portion omitted. (64)

Clarke and Jacyna (65) saw Prochaska's writings as more important and his influence lasting well into the nineteenth century in spite of confining himself to the spinal cord, the brain stem, the cerebral and cerebellar peduncles and part of the thalamus. Thus Unzer and Prochaska can be said to have originated the idea of reflex action of the brain but it was left to Laycock to expand the concept and apply it to psychology and psychiatry. Laycock later translated the writings of both Unzer and Prochaska for the New Sydenham Society (66).

In the translator's introduction Laycock said the Society required both works to be in one volume and as the work of Unzer was 800 pages, abridgement, which required free translation, was necessary and this placed great responsibility on the translator. Professor Marx said that "antiquated style and singular phrases" made the work difficult for German physicians to understand. Finally it was decided to give a literal translation of the short work of Prochaska omitting the appendix and a short free translation of

Unzer. Karl Marx assisted with the latter and gave information of a biographical nature which was also incorporated into the volume.

Other writers and Brain Reflexes

Wilhelm Griesinger who was also endeavouring to reconcile the body and mind published his Ueber Psychische Reflexactionen in 1843 quite unaware of Laycock's writings of 1839 and 1840. Like Laycock he arrived at reflex action of the brain by considering an extension of spinal reflexes to the encephalon and like Laycock considered the reflexes functioned in abnormal states, although not exactly in the same way as Laycock. He (Griesinger) in a later work wrote:

Now there are many states where the reflex is weakened or destroyed. This appears, to a greater or lesser extent, first, in the emotions which are still considered physiological states, then in almost all pathological states of the brain. (67)

A Russian, Ivan Sechenov, in 1863 is said to have published the best known early exposition of the theory that the reflex was the basis of all nervous function (68); this he did in ignorance of the writings of Laycock and Griesinger.

The concept of reflexes involving the brain had wide implications in neurology, philosophy, psychology and theology and was Laycock's most influential concept. Smith wrote (69)

Perhaps the most significant questions were concerned with how far the sensory-motor reflex structure, originally envisaged as the basis for simple automatic actions, could be envisaged as the basis for complex conscious actions.... Early work in this direction by Laycock, Carpenter, Griesinger, Sechenov and others led on to experimental work on brain function in the late nineteenth century.

Laycock constantly endeavoured to explain all psychiatric symptoms on the basis of cerebral reflexes and it is fascinating to read the ingenious ways he set about this. Further attention is given to this in chapter 5, but by looking for a neurophysiological basis in psychiatry Thomas Laycock can be said to have been an important person in the development of neuropsychiatry. Leff in an examination of Laycock and the cerebral reflex concluded (70):

Thomas Laycock's major statements have found a place in the history of mental science, but only at the expense of that which he spent so much of his time trying to elucidate, the cosmology from which those statements were born.

Amacher (71) writes:

The three most influential modern syntheses of nervous function, those of Pavlov, Sherrington and Freud, have all been dominated by a single concept.. that is the entire nervous system works on a reflex pattern... In 1845 Thomas Laycock made the generalisation that the entire system functioned on the reflex pattern.

Jacyna sees physiological psychology in which Laycock played such a prominent part as having social and political significance and wrote:

The rejection of dualism was therefore also the rejection of a particular version of ethics and social authority. There could be no transcendental ethics because there was nothing beyond the natural. (72)

Looking at Laycock's classical paper of 1845 (73) he can be seen to state overtly or by suggestion three important functions of the brain. Firstly and most important was reflex function later to be expanded by Pavlov who described conditioned reflexes and by Sherrington who showed the mode of operation of spinal reflexes and their modification by supraspinal reflexes.

Secondly Laycock believed in localisation of function in the brain, not in a phrenological sense of punctate faculty localisation but "instinctive and emotional acts

.....(which) may be traced from the simple reflex phenomena to the more compound". Instinctive acts were "altogether dependent on the connate structure of the ganglia." Thirdly Laycock gave a physical basis to the association of movements and ideas when he wrote "like the association of movements the true explanation of the association of ideas is to be found in the doctrine of reflex function of the brain". It was this triad of reflexes, localisation of function and association of movements and ideas that was to form the basis of so much progress in cerebral neurology and neuropsychology in the following century. Other speculations in the field of neurology and published later related to general medicine, tissue pathology and the functional mode of action of the nervous system were not successful in that they led to no further developments.

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CHAPTER 5

POLITICAL MEDICINE

During Laycock's years as a practising physician or Professor of Medicine there were three important interrelated events in medical life, the advent of the public health movement, the development of the British Medical Association, and the registration of medical practitioners under the Act of 1858; all these were events in which Laycock was involved personally and led him at times into public conflict. Some of the social and medical conditions in York in the early 19th century have been described in Chapter 2, and the conditions of hygiene and sanitation were to be of special concern to Laycock.

Background of the Public or State Health Movement of 1848

The Government began to consider sanitary reform following the cholera epidemic of 1831-33 and established a Central Board of Health in 1831 consisting of six doctors and five civil servants; there were also local Boards. The Central Board however had only advisory powers and many local Boards failed to co-operate with the Central Board. The other key factor in sanitary reform was the Poor Law Act of 1834 with Edwin Chadwick as the dynamic secretary to the Poor Law Commissioners; he initially persuaded some like minded doctors (Neil Arnott, James Kay Shuttleworth and Thomas Southwood-Smith) to study typhus mortality in London and other districts with a high incidence of that condition. Their report of 1838 was so disturbing that Chadwick decided to study some poor and slum areas throughout England and Wales, a move approved by the Home Secretary Lord John Russell (1). This came to be published in

1842 as The Sanitary Condition of the Labouring Population in spite of some conflict between Chadwick and his political superiors. It was a propaganda success furthering Chadwick's reputation and published under Chadwick's name. The report of 1842 prompted Sir Robert Peel's government in 1843 to appoint a Royal Commission to inquire into the "state of large towns and populous districts." (2).

The first British Public Health Act was in 1848 which created a central authority the General Board of Health which proved very unpopular as it interfered with local government autonomy. The Board was dissolved and Chadwick pensioned off, but public health could not be abandoned; the movement continued with Sir John Simon playing a leading role.(3)

A prominent authority on the period wrote:

public health more than any other issue in mid-Victoriaⁿ history could not be regulated by individual or group action, but needed the intervention of either Local Authority or the State. The cause of 'sanitary reform' was actively supported by doctors, clergymen, novelists (George Eliott as well as Dickens and Kingsley) and politicians, but since it touched on awkward problems of property rights, professional jealousies and administrative centralisation, there were difficulties in setting up adequate machinery. (4)

Early Victorian England witnessed great changes in civil administration with an increase in central agencies and numbers of civil servants. These resulted from the Poor Law Amendment Act (1834), the Municipal Corporations Act (1835) and the Act for the Registration of Births, Deaths and Marriages. Further the Health of Towns Commission indicated the need for the Government to care for the poor industrial classes. All of these involved vast changes in the ideas of and methods of administration of Government. (5) Naturally Chadwick made himself politically unpopular by attacks on vested interests and their opposition to sanitary reform.

Thomas Laycock's association with Public Health

Laycock's first involvement with Public Health was a publication of the medical statistics of the York Registration District (6). [Registration of Births, Deaths and Marriages had been recorded since 1836.] This was initiated by the York Medical Society and was designed to follow the 1838 report for London. The article was published under Laycock's name and dealt with the year 1840 from January to presumably July or August. The population of York was estimated at 30,000 to which was added 6,500 in the suburban villages; the country districts contained 10,000 to 11,000 population and the returns were recorded in two groups by the York Superintendent Registrar. In the City there were 582 deaths and in the country districts 111. Significant findings were that one half of all deaths occurred in those under 15 years of age and of these one third died of scarlet fever. Of those dying between 15 and 60 years of age consumption was the cause in two fifths; smallpox was prevalent in the autumn but nearly disappeared in the winter.

Laycock next wrote a series of letters to the Dublin Medical Press. The first (7) points to the great changes taking place in medicine at that time and Laycock foresaw medical men taking a much greater part in politics than previously. He said the old method of concealing ignorance under a title would soon be as obsolete as the full bottomed wig and gold headed cane. There was an important distinction between diseases on the one hand and the general health of a population on the other; the latter in the past had been the result of individual efforts, e.g. Edward Jenner. Even now, Laycock observed, our armies are being decimated (Walcheren expedition), our ships left almost without seamen, and contagious fevers hardly less destructive than the plague ravaging our cities, yet medical Corporations and the Government do nothing until the danger is imminent. In much of this Laycock may have been referring to the past, the illfated Walcheren expedition was in 1809 although at the time of his writing conflict with the Dutch over the establishment of a Belgian State seemed a possibility. Admiral Sir Gilbert Blane's Observations on the Diseases Incident to Seamen (1785) reported a

sickness rate of one man in fifteen and a death rate of one in seven among the sick (8). Sir Gilbert had in 1809 conducted a Government inquiry into the exceptional prevalence of disease among the troops in Walcheren. Civil and military medicine were fairly well defined yet political medicine, so important in Laycock's view because it comprised the prevention of disease, as well as the moral advancement of mankind, scarcely existed. The term political medicine used by Laycock was introduced in 1824 by the London Medical Repository, to cover a variety of medico-legal subjects which were published monthly in their journal. (9). In Laycock's opinion political medicine fell under several headings, forensic, hygienic, eleemosynary (medicine for the poor), that which brings medicine to bear on the extension of commerce and the founding of new colonies, and medical education, each of which he was to take up individually in following letters. It is significant that civil medicine (private medical practice) was not included in political medicine, only the treatment of the sick poor was to come under state control and it is evident that these patients were considered to be only a minority. On forensic medicine (10) Laycock regretted that no school of medical jurisprudence existed in spite of its strong links with the State; medical students passed examinations to practise with only theoretical knowledge. In 1830 The Society of Apothecaries made training in forensic medicine a requirement for their licence. A great concern existed at the time as evidence was often a matter of opinion, fell short of proof and legal cases often exposed the uncertainty of medical knowledge (11). Even if a medical witness was skilled and experienced, Laycock pointed out counsel could throw doubt on his competence by asking questions on which there were many different opinions. In other cases advocates eulogised on a medical witness and asked him to be positive on very doubtful issues. With reference to Coroners Courts, Laycock mentioned the difficulty practitioners experienced when asked to leave their practices for several days. Group practices hardly existed at the time. The remedy was for trained forensic physicians to be appointed as coroners; these would have no practice to leave and lose no income by attacks on their reputation. The superintendence of lunatic asylums should also be entrusted to such men who would determine all questions of law relating to unsoundness of mind and the

validity of a plea of insanity in criminal cases. The cost would not be so great as might be imagined, as the considerable sums currently being paid to medical witnesses would be saved.

From its first appearance in 1823 the Lancet, edited by Thomas Wakley, had advocated medical coroners and constantly commented on individual inquests, recording the absence of medical testimony or the misdirection of juries. When a Member of Parliament, Wakley had introduced successfully a bill for the payment of physicians carrying out autopsies made at a coroner's request and for the fees and expenses of medical witnesses at Coroner's Courts. Wakley himself finally became the coroner for West Middlesex in 1839 but initially he had many political difficulties (12).

The following letter (13) entitled "Medical Police" referred to a body of medical men who would have the task of removal or prevention of all agencies which might affect the health of the community, to restrain dangerous lunatics, to arrest and punish the charlatan, to maintain villages, towns and cities in a sanitary condition and to arrest or minimise epidemics, an extremely wide ranging task if these were to be the duties of the same individual. The word police used in the context here goes back to seventeenth and eighteenth century German thought (14). A framework of administration was being developed called cameralism whereby a central authority implemented policies and trained officials working for the state. Within cameralism police was a key concept in relation to health and disease (the actual word police being of Greek origin from politeia) and referred to those who administered social and health matters. The idea was reinforced by a publication in 1779 by J.P.Frank's System einer vollständigen medicinischen Polizey which had a great influence in countries outside Germany including France where cameralism was known as mercantilism. It was Andrew Duncan of Edinburgh University who first introduced the term to the U.K. when in 1798 he addressed the Patrons of the University on medical jurisprudence and medical education. Initially the whole of medical and health matters came under the jurisdiction of the medical police but afterwards it was only the control of infectious diseases, sanitation and medical treatment for the sick poor. About 1800 foreign

invasion, political weakness and disorganisation led to the idea of medical police being abandoned and after the downfall of Napoleon social problems of health and disease were approached in a different way.(15) Cameralism or mercantilism were never incorporated into the Napoleonic code. In the United Kingdom the term medical police passed out of use about 1840. The Metropolitan Police was established in 1829 and County and Borough Police in 1856 leading to police being associated with the apprehension of criminals rather than the administration of civil legislation.

Laycock regretted that preventive medical science had not advanced, since the discovery of the steam engine gave so great an impulse to industry, with the result that the mortality in manufacturing towns was as high as the worst periods in history (the plague years excepted). He saw extreme poverty as demoralising as extreme luxury and more dangerous, for if unchecked, it resulted in a series of moral convulsions leaving nothing but fanaticism, irreligion or misrule. This was a common view at the time resulting from the excesses of the French Revolution. Aggravated poverty was seen as begetting moral degradation and vice.

Laycock wrote:

let any member of Parliament accompany a medical officer from a dispensary in a large town on one of his visits; let him enter the one room of a cellar or kitchen occupied by two or three families, several of their members labouring under disease, probably infectious feverlet him observe the dark damp walls, the littered floor, the handful of fire, the ragged beds of rotting straw, the broken furniture and feel the heavy oppressive vapour around him, and let him ask himself whether he would not without the slightest hesitation prefer the nomadic savage.(16)

As noted in chapter two Laycock was himself a physician to a dispensary in a large town (York) and had been a student at the Westminster General Dispensary;

conditions seen would be typical of most large towns. The situation had been concealed, he thought, because it had been compressed by a large superincumbent civilisation.

He continued by describing the benefits which would result from 'Medical Police'. They would diminish sickness among the labouring classes and increase their capacity for labour, improve their comforts and improve morals. Education moral and religious discipline and private benevolence may be useful helps, but the essential was a system for sanitary regulations.

By raising the standard of health in the towns, the skilled operative could better compete with the healthy immigrant from rural districts, which would result in more returning to agriculture and in return this would lead to men going to the Colonies, thus strengthening the Empire and enlarging commerce. Finance was not neglected; Laycock considered that better health in the labouring classes would mean fewer criminals, lower Poor Law rates and less expense for medical charities. He calculated that if mortality was reduced by one or two per cent £90,000 could be saved in funeral expenses which in high mortality districts averaged thirty shillings per burial. If rural districts were included the saving for State internments would be £120,000 per annum nation wide.

A further function of medical police would be the suppression of quackery. After writing of the history of the travelling mountebanks Laycock defined them as individuals who professed to treat disease successfully by inadequate means or who acted as medical practitioners without having studied medicine. By this definition quacks could be divided into three classes. Firstly there were those who operated by heredity or mystical powers such as a seventh son of a seventh son, shrine keepers, peddling quacks, residential quacks and the swindling adventurers with universal medicines. The second class was the patent medicine dealer who retailed various nostrums, and the third class were amateur doctors, male and female, who had a treatise on domestic medicine and a medicine chest. These different forms of quackery must be combatted in different ways. Those of the first class should be treated as rogues and when they kill anyone should be treated as sheep-stealers or similar fellons. Those in the second and third classes would be much diminished if in all cases of death a sum was levied upon their

property for the benefit of the widow, children or relatives of the deceased. Those who practised without appropriate training or qualifications opposed any lay-professional barrier. (17)

Since people would always purchase drugs, they would inevitably ask the opinion of the drug dealer which they considered equal to that of the physician and cost nothing. The public good could therefore only be secured by putting medical science into the shops.

In reading the contents of this letter, the historical situation has to be borne in mind. Many chemists and druggists who had emerged as a branch of the medical profession in the eighteenth century and as part of the commercialisation of Georgian society, were both shopkeepers and doctors. The 1815 Apothecaries Act had done nothing to restrict their freedom to practise in the way they did. The many medical reform movements were concerned with creating a monopoly for the licensed practitioner; and general practitioners wanted to break down professional barriers between physicians, surgeons and apothecaries and to have one licence for all. The Pharmaceutical Society had just been established in 1841, at the time of Laycock's letter, but it admitted all who had a chemist and druggist shop (18), men considered beneath the qualified practitioners of the period. Better medical training and increased medical knowledge led medical men to press for medical reform, but it was not until the Medical Registration Act of 1858 that a demarcation was drawn between those entitled to practise, whether physician, surgeon or apothecary and those who were not qualified. It was typical of Laycock and the period that he should address these questions with forthright statements.

Eleemosynary medicine (19) was another topic on which Laycock wrote and commenced by remarking that medical aid was as much a necessity of life as food, clothing or shelter, and asked if it was the duty of society to provide the former, why not the latter. In Europe (by this France and Germany were meant) the provision of medical aid for the poor was a Government concern whereas in Britain it was on a voluntary basis and this resulted in an unfavourable situation compared with Continental neighbours. In Paris hospital beds were 1 to 160 of the population, but in London 1 to

480. In York there was only 1 bed for 500 of the population and many beds were occupied by country patients as the York County Hospital served both city and county. In many towns- Leeds, Hull, Sheffield and Manchester- the situation was probably much worse, although Laycock gave no figures. The letter continued by observing the provision of services for the sick poor fell under three headings, hospitals and infirmaries, dispensaries and the medical staff of workhouses maintained under the Poor Law. It was regretted that the medical officers of these institutions were not appointed on merit but on family connections, wealth, low intrigue or underselling, resulting in the most incompetent person being appointed. Often services were given gratuitously in return for advantages in other directions such as fastening private patients on to the charity. Laycock asked if it were not better that medical officers were salaried and elected for a limited period (this has a very modern ring). It would be a kind of a medical foothold by which the medical officer might advance science as well as his own interests.

The deficiencies of senior staff at hospitals or dispensaries who resided at some distance and were often away from home on account of their private practice were recorded. They attended Dispensaries for an hour or so but did not see the worst cases, the task of home visits often being undertaken by the apothecary or a pupil, a situation shared with the hospitals and one which was to continue into the present century. Further it was a matter for regret that a resident medical officer should be required to have no more knowledge than that to carry out the orders of his superior; if he was too clever he was considered a nuisance. The resident medical officer should be the important person who could call on the visiting staff if in need of consultation. One wonders if Laycock himself suffered by being thought too clever when he was a resident apothecary and had to carry out the instructions of physicians and surgeons. Probably he considered himself capable of dealing with most emergencies.

Of the necessity for Boards of Public Hygiene acting under the control of a General Board and the authority of the State, Laycock considered there could be no doubt (20). The duties of such Boards would be giving effect to existing laws,

considering all matters "vitiating the air or rendering food and drink unwholesome". They would have to decide upon the qualities of suspected butchers' meat, on bread, flour, wheat and on water supplied to the people. They would supervise the emission of smoke and noxious gases from factories, overcrowded dwellings, crowded grave yards, drainage and sewerage and the ventilation of public buildings. These Boards would in the course of their duties discover the laws governing epidemics and diminish their mortality by accurate comprehensive observation; they might therefore be termed medical observatories. Statistics of every district throughout England and Wales should be collected from the registers of births, deaths and marriages and these could be compared with peculiarities of the soil, meteorological phenomena and the social conditions of the inhabitants. Laycock ended by recognising that opposition to the Poor Law Act had arisen from too despotic proceedings and if Boards of Health were to be successful they would have to carry the agreement of the majority of the population. A solution would be to make legislation general and methods of enforcement tentative; details would evolve themselves under firm and judicious guidance. This was Laycock's hope, but he had no personal experience of enforcing public health enactments.

In his seventh letter on political medicine (21) Laycock considered the need of special medical schools for those who would practise in the colonies and said the state could derive more from medicine when it was connected with commerce and diplomacy than it did in times of war. Attention was drawn to the work of medical missionaries; Wesleyan Societies were most anxious to secure the services of medical men and a society of the established church had founded a medical school in Jerusalem. England was leading the civilised nations in carrying that civilisation to regions unknown by the emigration of an overflowing population. Medical topography was, as a subject for investigation, looking into the connection of diseases peculiar to a climate or site. Colonial medicine as a speciality would also encompass anthropology, studying the various races and their physical condition together with their laws and customs. Such a school of colonial medicine would, claimed Laycock, also prove a lucrative undertaking as explorers, intelligent commercial agents, missionaries and emigrant

medical practitioners would avail themselves of the services of such an institution. The school would not only be a centre from which useful knowledge was diffused but also a centre to which knowledge might be drawn. Years however were to elapse until the foundation of the London School of Tropical Medicine (1899) or the Liverpool School for Tropical Medicine (also 1899). In the early part of the nineteenth century there had been a terrific movement of population out of Great Britain. Briggs records that in 1830 over 55,000 persons left the British Isles and by the late 1840's and early 50's more than a quarter of a million emigrants were leaving annually, many going to the U.S.A, Canada and Australia (22).

The final letter on political medicine related to Medical Education (23) and was thought by Laycock to be the most important branch of political medicine, as the subject was only just beginning to emerge from darkness and confusion. An important truth, in his opinion, was that medicine and surgery were inseparable both in theory and in practice. At the time of writing it was possible to qualify individually as a member of the Royal College of Surgeons or a Licentiate of the Society of Apothecaries although most practitioners in fact held both diplomas.

It was regretted that medical education had been dominated by London so that it 'becomes dyed with metropolitan ignorance, prejudice and exclusiveness' (24). He instanced the London College of Physicians who, by their regulations respecting the extra-urban Licentiates, considered them an inferior grade of practitioner good enough for the population outside London.

Some of Laycock's general views on State medicine were written in 1842 when he reviewed works on the subject by two French authors and one British (25). He commented that the science of hygiene was little cultivated in England and that such matters were better managed in France and Germany. Public Health had been established in France by the Napoleonic Code, and in the Germanic States in the eighteenth century. In one of the works the views of Mr Malthus were discussed who held that the growth of population was checked by shortage of resources and attendant vice and misery or the preventive check of moral restraint. The author of the volume

reviewed, Archibald Alison (and brother of W.P. Alison), a lawyer, did not deny the power of moral restraint but considered it not only a preventive but a positive check on population, an opinion with which Laycock agreed. He said a young man would take care how he embarrassed himself in his struggle upwards with a dead weight of a wife and children. Marriage would probably be delayed until the age of 30 or 40 and by then the fecundity of marriage was halved; the influx of persons of inferior rank to the professions created competition as they endeavoured to ascend into society. Perhaps Laycock identified himself with entry from below as he was especially ambitious professionally.

Commenting on the influence of climate on moral behaviour, Laycock wrote:

it seems to us that the habits induced by climate induced changes in the cerebral organisation of nations as well as in the muscular and osseous conformation, and that the mental and corporal qualities which result from these changes becoming hereditary, characterised the race.

Laycock followed the trend of the time in his optimism for the future of science and medicine. The medical profession was for the first time free of control by monarch or priest, medical science was the most important product of modern civilisation. In conclusion Laycock hoped to convince Mr. Whewell that medicine was a science. It is likely this hope arose because at the 1835 meeting of the British Association for the Advancement of Science Coleridge forbade members to call themselves philosophers and Whewell suggested the name scientist for all who studied the natural world(26) .

Public Health and the City of York

Having declared his interest in the current health issues of the day it was natural that Laycock would wish to have some continued place in the ensuing administration and action. He undertook local research and was later to write:

I had the happiness to anticipate the constitution and working of the 'Health of Towns Commission' by making an enquiry into the sanitary conditions of the parish of St.Dennis in this city in co-operation with the estimable rector and two members of the Society of Friends well known for their public spirit, Mr Tuke and Mr Rowntree. When a public meeting was held in the Guildhall a committee was appointed to assist in the inquiries of the commissioners and I had allotted to me the laborious post of honorary secretary. (27).

The commission sent out to selected towns and populous districts a questionnaire of 64 items and pointed out that the average mortality of all England was 2.2 per cent while in many parts it was very much less. The ratio of mortality amongst young children was excessive while only a small proportion of deaths resulted from advanced age, and a high mortality among the younger men resulted in a large number of dependents, widows and orphans who needed public support. These facts strongly suggested the need for a close investigation into the causes of mortality and the means of their prevention.

York was one of the cities selected as its mortality was 2.4 per cent for the years 1840, 1841 and 1842. On the 24th of November 1843 Edwin Chadwick with James Smith, a Health of Towns Commissioner, went to York to meet the magistrates and a number of medical men including Thomas Laycock. The commissioners outlined the purpose of the enquiry and founded a committee to give a co-ordinated reply from the report made by district visitors. Alderman George Hudson suggested Thomas Laycock as secretary as he had previous experience of the subject (presumably referring to the report on medical statistics of the York registration district written by Laycock in 1840). The Committee included the Rev.Vernon Harcourt, M.A.,F.R.S.,F.G.S. chairman of the York Poor Law Union and Canon Residentary at the Minster and Mr W.L.Newman of the Yorkshire Fire and Life Insurance Association. The Committee with the Rev.Harcourt as Chairman was known as the York Sanitary Sub-committee (28).

From the Chadwick manuscripts it is evident that following the meeting a correspondence developed between Chadwick and Laycock in which Chadwick suggested Laycock should write to the Lancet on various issues relating to Public Health. At this stage Laycock may well have felt honoured to be associated with Chadwick. In a letter of the 2nd December 1843 Chadwick said it was important for the public to realise the significance of a Medical Officer of Health but if Laycock did write to the Lancet, he (Chadwick) should be given no praise (29). On January 6th 1844 Chadwick wrote thanking Laycock for a communication to the Lancet which he said was highly judiciously done and suggested there should be petitions from working men and that Laycock should write to the Lancet on that issue (30) and a week later he again suggested Laycock writes to the Lancet on the unsatisfactory nature of death certificates (31). In February 1844 Chadwick further suggested to Laycock that he (Chadwick) should look at the draft report for the Commissioners and offer any suggestions which might occur and commented that Laycock should write the parallel course of past epidemics, plague, sweating sickness, cholera and fever (32). Later in April Chadwick had read the draft and said "dullards" would consider it not a practical paper, he wrote an introduction and said the average age at death in the last 30 years should be compared with the age of death of agricultural labourers (33). In April Chadwick again wrote saying that his work on the circumstances governing mortality had been criticised by the Statistical Society because to show only the average age and proportion of deaths was erroneous if the age distribution of the living population was not shown (34). On the 8th May Chadwick wrote a further letter:

I have had this morning an opportunity of reading your report on the sanitary conditions of York. I have no hesitation in saying I think it is the most able report I have seen under this or any preceding enquiry into the sanitary conditions of any town. Other reports have very high degrees of merit on particular points, but none so complete as an exposition for non-professional persons or so complete as a whole. I think it does the committee credit that you have been

allowed to work on the results without interference or interruption.

I shall use whatever influence I may to give it promulgation (35).

Perhaps this is not a surprising comment in view of Chadwick's part in its preparation. Henry Hobhouse secretary to the commissioners and a Mr James Smith a commissioner also wrote laudatory letters.

The report (36) commenced with a topographical and geological account of York by the Rev. William Harcourt and then a report on drainage by an architect Mr. J. B. Atkinson. This was followed by 13 pages written by Laycock and gave details of the streets already drained by City authorities with length, size and cost of draining and the length of streets paved.

Inefficient as the sewerage system of the city was it was rendered more so by the fact that back courts and streets and many dwellings had no side drains communicating with the sewers already formed. In newly built ranges of cottage tenements there was only one privy to four, eight, twelve or even fourteen families.

The courts and alleyways of the poorer classes were cleansed by scavengers and the report stated :

the night soil is retained giving off impurities until a sufficient quantity is accumulated, when it is removed from the yard during the night in barrows and this method was also used for private houses and put in the street; from thence it is carted away to large dunghills within the city..... In addition to the night soil there is the manure of pig stys, cow houses and stables all of which are found in great numbers in the courts and yards of the poorer classes.

The city commissioners were vested with powers for the enforcement of cleansing and the prevention of public nuisances but it appears from the statement just made that the powers were inadequate or not used for attainment of the object in view.

The report continued with information relating to the ventilation of dwellings, smoke from steam engines and information relating to schools, public buildings and public walks.

The unsatisfactory nature of churchyards was described. They caused obnoxious atmosphere in churches, as many of the churchyards were raised above the level of the street by the accumulated remains of generations. Many nearby wells were tainted from these churchyards. Tables were given relating to deaths under 15 years of age, percentage of deaths under 15 years, percentage of people dying from epidemics and contagious disease and the average by class of those dying over 21 years of age.

Next followed a series of tables covering drainage and ventilation. Interesting information was given on little studied social aspects of illness such as the number of benefit societies, the numbers claiming benefit, the duration of sick pay and the sum paid per head during the period of sickness. Details of expenditure of the Board of Guardians was given together with the number of patients treated by the York County Hospital and the York City Dispensary. A table was also given showing the improvement in the health of York since the period 1770-1781 to 1838-41. In the first period the average age of death was 28.34 years but in the second period it was 32.21 years: a small increase leaving much room for further improvement.

Dealing with the last cholera epidemic Laycock indicated it was fatal to the people in proportion to the deficient drainage in their locality. The poorest parts of the town were along the banks of the Ouse and the Fosse, although the Fosse was at least seven feet higher and the ground rose steeply on each side of the rivers, the higher areas being more healthy. The concluding paragraph of the main report reads:

the means requisite to be adopted for the improving of the sanitary conditions of the labouring classes in York are, I presume sufficiently detailed in the two reports and appendix. Although systematic and provident application of the best medical and physical architecture, drainage and sewage and the hydraulics generally of towns would without question be the cheapest eventually although

possibly the most costly at the outset.

The main report was followed by a fifteen page appendix giving details of domestic accommodation, time in each residence, the numbers of sick attended by medical officers of the Union and the Dispensary and the average age at death of the various parishes compared with the city average. An incredible amount of detail was given parish by parish and churchyard by churchyard.

Following the appendix to his report to the Commissioners, Laycock gave an account covering seven foolscap pages of epidemics in the sixteenth, seventeenth and eighteenth centuries affecting the City of York. The black death came to the City in 1349 raging from April to the end of July, so many dying that the common graveyards were insufficient for the internment of the dead. A second wave of plague started in London in 1363 later spreading north and eventually reaching York, the epidemic waxed and waned; in 1390 11,000 persons were alleged to have been buried in York, more than half the population at that time. The mysterious sweating sickness, characterised by sweat running through the bedclothes in a stinking stream, respiratory difficulties, wrinkled skin and blueness of the hands and feet reached England in 1485 and later reached York in 1493. A further serious outbreak of the sickness occurred in 1550 and an account of the sanitary regulations of the period were noted; a red cross with the words "Lord have mercy upon us" was to be placed on the door of all infected houses and members of such households were to carry a white rod two feet in length when they went out. Laycock observed much light could be thrown upon epidemics by the study of valuable ecclesiastical records at the Minster.

The next great plague in York was in 1604; but even in the absence of epidemic, mortality was high from infectious diseases, which would include smallpox, cholera, typhus and various exanthemata, such as scarlet fever. In "normal" years this would result in one death in ten or fifteen of the population, but in epidemic years one in three or four or even one in two would die.

These epidemics, said Laycock, were due to no effort being made to purify the city from miasmata, "there were wide stagnant moats, no drainage, narrow streets and

filthy open channels, the tide flowing above the city and the ebb leaving sludge and mud on the banks of the river and exposing the mouth of open sewers". It was the low lying parishes which suffered most, next those on the made ground between the two rivers and on the east bank of the River Foss; the outlying parishes were least affected.

The Journal of the Statistical Society for 1845 contained a short report (37) by Laycock to supplement the printed report by the Health of Towns Commission. This contained a clear table showing the effects of altitude which affected drainage, together with population density and connected death rate and percentage of those dying under one year of age.

	Mean Altitude.	Popula- tion.	Inhabitants to One Annual Death.		Mean Age at Death.
			From all Causes.	From Epidemics.	
1839-43					
Best conditioned portion of the intermediate parishes . . . }	49	4,858	43·92	398·18	29·35
Worst conditioned portion of the intermediate parishes . . . }	38	6,871	37·75	224·54	26·42
1839-41					
Best conditioned portion of the intermediate parishes . . . }	49	4,858	43·91	323·86	30·48
Worst conditioned portion of the intermediate parishes . . . }	38	6,871	37·08	177·08	27·35
1842-3					
Best conditioned portion of the intermediate parishes . . . }	49	4,858	43·95	607·23	27·66
Worst conditioned portion of the intermediate parishes . . . }	38	6,871	37·68	371·40	24·66

I will now explain how the data of these tables were obtained. My first object was to get the simple facts from the Registrars' books, and have them

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He was also Secretary to the Statistical Section of the B.A.A.S. Since 1835 the Association had allowed medical statisticians to lobby certain M.P.s concerning the registration of deaths in Scotland. Professor W.P. Alison in 1840 recommended the Statistical Section to urge the Association to press the Government to extend to Scotland the registration system of births, deaths and marriages which operated in England, but this was rejected by the general committee. By 1844 Laycock, Secretary of the Section of Statistics, knowing of past failures wrote direct to Sir James Graham, the Home Secretary, on behalf of the Section saying the Association had granted £40 towards the continued enquiry into sickness and mortality in York and for this purpose he had drawn up a form for the Registrar and enclosed a copy. He also took the opportunity of raising the problem of registration of Scottish births, marriages and deaths but this did not happen until 1855. Statistics were becoming important at this time and, characteristically Laycock was associated with current movements. The Registration Act of 1836 had given vital statistics its impetus. (38).

Further letters from Chadwick to Laycock occurred in 1847 when the House of Commons was debating the Health of Towns Bill which was vigorously opposed by George Hudson of York who at that time was M.P. for Sunderland. Hudson said:

for his part he had never heard of so monstrous piece of legislation as a measure which authorised commissioners to send down inspectors to every town in the Kingdom to make surveys.....he did not see why the towns were to be interfered with and directed in so vexious a manner: the effects of that interference would be to paralyse the exertions of local authorities.

On 6th July 1847 the Bill was again being debated when Mr Wakley (M.P. for Finsbury) spoke and ended by saying he would read a letter from Dr Laycock of York. After outlining the establishment of a Sanitary Committee and the 1844 report, the letter stated:

Mr Hudson had no knowledge of the sanitary conditions of the city;
he has probably never visited a poor sick person in his life unless

it was at the earlier period of his career when he was a Methodist prayer leader.

Hudson replied that he thought, as he had said before, the report relating to York was exaggerated. As for Dr Laycock's remarks he (Hudson) had lived in York for 33 years and visited, he believed, every hovel in it; in contested elections he had visited every elector. He did not know whether the ^{an} illusion to being a Methodist exhorter was meant to be a disgrace but he was proud of any connection he had had with them and could only think that Dr Laycock had written to Mr Wakley fancying that he would give him the opportunity of holding forth. Dr Laycock was a young man with some talent but did not fill so prominent a station as he might wish nor had he much practice in York (39). A letter from Chadwick to Laycock dated 7th July 1847 (40) stated "you have got the enmity of Hudson" and in a reply dated 9th July Laycock wrote "I got this morning a threat of action for libel purporting to come from Hudson; I think it is a hoax." (41) No further action with regard to libel appears to have been taken.

These letters of Chadwick's raise unanswered questions. His letter of the 7th July 1847 (42) headed 'Confidential', makes it certain that Chadwick knew Laycock's letter was to be read in the House by Mr Wakley, but at the end of the letter he wrote:

the truth will come well from whatsoever quarter but it would perhaps come best from one of the congregation, as many must now feel indignant at his disowning them and entering into an alliance with the Dean of York when his interests changed.

The background to this was that George Hudson had inherited money from his uncle and then presumably left the Methodist Church. It would appear that Chadwick was hoping to arouse Methodist opposition to Hudson but in the event Hudson stated his pride in having been a Methodist. A previous letter of Chadwick's also headed 'Private and Confidential' to Laycock dated 10th September 1845 (43) related that Chadwick had written to Robert Stevenson in the hope of Stevenson's persuading Hudson to support a Towns Improvement Company for which he hoped to raise

£650,000. Laycock was asked to inform Chadwick when Hudson was next in York so that he could call upon him in person.

From reading the correspondence Chadwick comes across as a very manipulative person who was not too concerned with the consequences for the people he was manipulating.

Although Hudson rose high in society and became a friend of Prince Albert, his affairs were investigated in 1859 and he was found guilty of mishandling shares. No prosecution resulted, but his personal fortune and good name were lost and he died aged 70 in 1871 leaving under £200 (44). Laycock dined with Hudson on one occasion and described him as a product of wealth and vulgarity: Hudson talked of 'hincome' and later laughed and roared as if he was in a party of tippling sailors (45).

Fevers

Closely associated with sanitation and public hygiene were the epidemic fevers which have been with man from ancient times and which caused such great medical problems in the nineteenth century. Most publicised was cholera but there were also epidemics of typhoid, typhus, influenza, smallpox, diphtheria, scarlet fever as well as the common epidemics of childhood measles, mumps and chickenpox.

Having been associated with the sanitary movement it was inevitable that Laycock would write on fevers. In a clinical lecture of 1846 (46) Laycock said he put summer diarrhoea, cholera morbus and typhus fevers together because he thought they belonged to one family having a common origin. The detailed clinical symptoms can be briefly summarised. Summer diarrhoea had a sudden onset with pyrexia, headache and diarrhoea and lasted for about 48 hours. Generally it abated spontaneously but it

sometimes persisted with griping colicky pain which could be relieved with medicine.

Cholera morbus was a more active and violent form of the diarrhoea described above. It lasted longer, was associated with vomiting and great loss of strength. Analogous to European cholera but more violent in its manifestations was Asiatic Cholera; most tropical poisons were more violent Laycock thought, as were the resulting fevers. "The proper and sure methods to exterminate the Asiatic cholera is to introduce health police into the cities of Asia".

Typhus was seen as a major disorder with diarrhoea as a minor complaint and an accurate clinical account was given in accordance with the thinking up to the pre-bacteriology days of the 19th century. The restlessness of the patients, even delirium, the tremor of the hands, the brown glazed appearance of the tongue and the faecal odour was thought of as a consequence of the frequent motions. The commonly described ataxia and inco-ordination were thought by Laycock to be connected with the fever and indicated a disorder in the cerebro-spinal axis. Possible chest complications were also noted. The clinical distinctions separating typhus and typhoid were not listed but Laycock would have recognised the differences when they were described by William Jenner a few years later.

With regard to aetiology Laycock wrote:

Is typhus fever a cholera infectious or contagious? Here is a knotty point. Opinions have been pretty evenly divided upon it.

Infections were conveyed by miasma whereas contagions resulted from physical contact, as in wet nursing or venereal disease. He was certain that epidemic fevers arose from miasma diffused in the air; this was the orthodox view at the time.

To account for a disease being mild in some cases and virulent in others, Laycock wrote:

If they attack a person living in impure air and personally unclean, the infection although mild as regards the person from whom it was communicated will be malignant in the person

affected.

Of persons living exposed to powerful miasma yet always healthy, Laycock said he had never heard of a satisfactory explanation, 'it is yet a mystery to physiology and pathology.'

Treatment was considered very simple, diarrhoea should not be stopped too soon as the bowels should be well cleaned by purgation, although magnesia or chalk should be given if the diarrhoea proved troublesome. If the diarrhoea was severe and persistent opium and calomel should be administered. In typhus the best treatment was expectant; the patient should have plenty of fresh air, a goodly amount to drink in thirsty patients, bedlinen should be changed frequently and cold sponges given if pyrexia was persistent and excessive.

He wrote a further paper in 1855 on the "Nosological arrangement of fevers intended as a guide to diagnosis and treatment".(47)/Laycock stated that fevers had occupied his mind in connection with early sanitary enquiries and subsequently as a teacher of medicine. There had been many attempts to classify fevers by symptoms, or by the nature of pyrexia, e.g. continuous or remittent, but Laycock sensibly expressed the view that classification by symptoms was useless. His basis of arrangement was by aetiology and he considered every fever to be occasioned by the circulation in the blood of a noxious agent and fevers were therefore a branch of toxicology; all the noxious agents were of organic origin. The pyrexia which accompanied inflammation was regarded as distinct from specific fevers. This distinction was made because pyrexia from inflammation was an everyday occurrence especially in surgical wards, but patients with specific fevers and those with exanthemata were never knowingly admitted to the general hospital. The inflammatory pyrexias Laycock divided into acute without pus formation, acute and chronic with pus formation and those with gangrene. In this Laycock's classification on aetiology seems an improvement on that of Cullen who classed infectious diseases and inflammations under the class pyrexiae and considered contagion the result of indirect action of miasma.

With the specific fevers various courses might be followed once the poison had entered the blood. It may be eliminated and no untoward result followed; it might be only partially eliminated and only manifest when some depressing character arrived, e.g. fatigue or anxiety, or the poison may take effect without any supplementary condition. The causes of specific fevers were marsh emanations, (malarial) faecal, sewer emanations, or miasma, emanations from the body, infections or the exanthemata; there were contagious but not gaseous poisons from personal uncleanness, epizootic poisons and retained excretory poison (each constituted an order). The last order was to continue in the form of auto-intoxication for many years. Laycock went on to call each aetiological group of specific fevers an order. He continued with suborder and genus and then each specific fever was called a species rather like a botanical classification. In a few instances there was some merit in the classification, e.g. grouping glanders with malignant pustule (anthrax) as epizootic and putting the miasmatic conditions together because there was colonic inflammation. Nevertheless the general effect of the classification was still to resemble a botanic one.

It was this detailed classification that Laycock wrote on his blackboard before each lecture on fevers and was no doubt boring and seemingly irrelevant to many medical students, although much of Laycock's writing on symptoms, diet and management were sensible. It is this classification that Syme sought to ridicule at an Edinburgh College of Surgeons conversazione in December 1863 by saying Laycock placed in the hands of his students a list of no fewer than eight hundred fevers. When told this was incorrect, he added a footnote to his published address in the Edinburgh Medical Journal for January saying he made the statement on the authority of a student; he now understood there were only five hundred (48). The published nosology in fact contained 7 orders, 23 genera and 31 species.

Epidemiology

Laycock often wrote about epidemics chiefly giving clinical descriptions as well as discussing aetiology.

a Febrile upper respiratory catarrhal illnesses have probably always plagued man and Laycock wrote a paper on epidemic of catarrh or influenza in 1847.(49). It was 11 years since there had been an epidemic of influenza and he started by describing patients. Symptoms comprised rigours, pyrexia, tachycardia, headache, muscular pains especially in the back, coughing and sneezing; some had sore throat and some diarrhoea. A few experienced delirium but in most the temperature returned to normal in 4 days. Fatal termination resulted from bronchitis and pneumonia, although some deaths could have been reported as asthma; most fatalities occurred in the aged. Of an epidemic in 1658, Willis wrote

Suddenly a distemper arose, as if sent by some blast of the stars which laid hold on very many together: that in some towns in the space of a week a thousand people fell sick together.

Laycock estimated a third to a half of the population of York were affected in the epidemic of which he was writing.

There were three causes generally held responsible for the epidemic.

1. Atmospheric vicissitudes of temperature
2. Poisons in the air arising from the earth, a sort of miasma or infinitely minute vital atoms.
3. A contagious element like smallpox

Laycock examined temperature variations in relation to influenza epidemics and concluded temperature did not determine the appearance of the epidemic, but if the weather was cold, more people died. Some contended electrical changes in the atmosphere were important, but Laycock discounted this. The third possibility, a contagious element like smallpox, depended upon analogy and could be fallacious. Influenza tended to appear and disappear like other epidemics but the question of

immunity after one attack was dubious. Thomas Beddoes collected data in an epidemic of 1803 and concluded that those who had the illness in an epidemic of 1788 were not affected. Many however had vague notions of influenza and Laycock did not consider this report reliable. Laycock himself had had influenza in 1837 and so far had not had another, but he doubted if this was general.

Influenza differed from other epidemics in that well drained and ventilated dwellings did not offer protection nor did good food and sound health. The ease with which the epidemic spread was related to the illness affecting the mucous membrane. The Black Death of 1348 affected predominantly the respiratory mucous membrane and that illness spread incredibly rapidly. If influenza was a contagion like glanders and the mucous from the nose resulted in a rapid spread, Laycock thought it would not be amiss to experiment with the fluids from those suffering from influenza. He had often seen patients with pyrexia, cough and marked dyspnoea, yet an examination with a stethoscope nothing abnormal was found.

Since the mode of transmission was similar to that of smallpox or measles the routes taken would be similar. Most patients only required confinement to the house or bed, simple diet and a gentle aperient. If headache or delirium was present, 5 to 10 grains of Dovers powder with a grain of calomel was suggested. For a very violent cough opiates might be required and ipecacuanha or ammonium chloride in old people. These were to remain standard forms of treatment until the current century. The students were warned that some still recommended and undertook bleeding in cases of influenza, but Laycock considered this was rarely required.

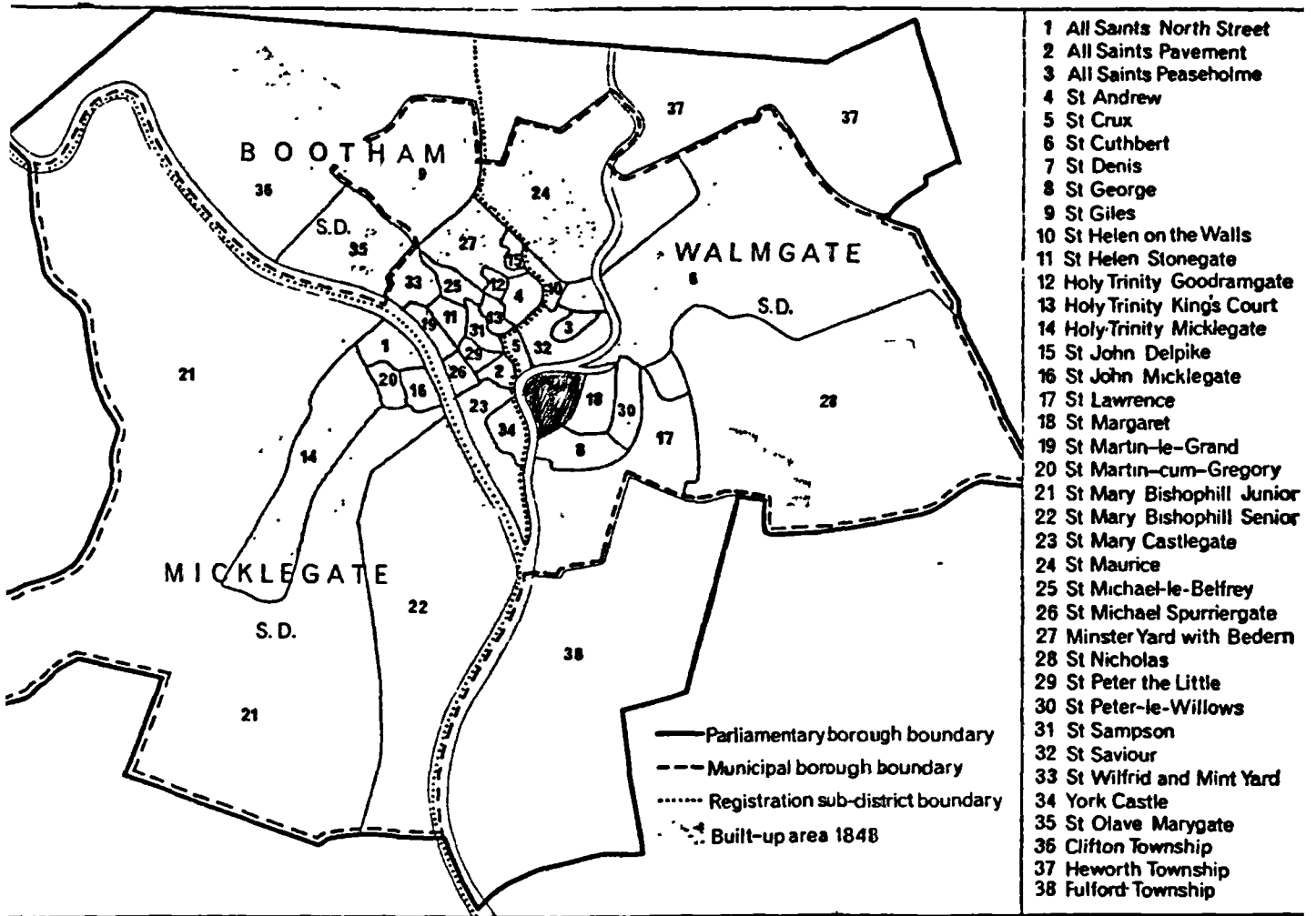
A portion of Laycock's lecture to the York Medical School on "Summer diarrhoea, cholera and typhus fever" which dealt with environmental issues was reported in the Yorkshire Gazette (50), virtually verbatim under the title "Sanitary arrangements and their importance".

The prevalent bowel complaint occurring mostly in the summer months popular opinion attributed to people eating too much fruit, but many more people had not eaten fruit and could not afford to buy it and still suffered. In the early 19th century in York

salmon were plentiful and cheap in the summer months so that thrifty housekeepers pickled it, and there were those who attributed an attack of cholera to eating pickled salmon. Laycock continued "in the plum season that is considered a satisfactory explanation of an epidemic of diarrhoea in spite of many people not having eaten them." Laycock thought these factors could be antecedents or predisposing factors of cholera and typhus but not its true pathological cause. He himself ate fruit moderately, thought it an excellent summer diet and he had never had cholera or diarrhoea that had been at all troublesome.

Basically the summer heat led to frightful miasmata from gulley holes, cess pools, churchyards, street drains and "stink holes". He again emphasised the susceptibility of the low lying areas by the riverside, where the poorest people dwelt was again emphasised.

A particularly susceptible parish was that of St Denis (coloured red in the subjoined map) although the whole of the Walmgate area was a poor one with a high incidence of infectious diseases.



Map 2. Parish identification map

From Armstrong A.(1974) Ref. 62 Chapter 2 P.209.

The reference to miasma relates to an ancient concept of disease caused by an environmental polluting agent. These were not defined but included impure air from stagnant marshes or pools, vapours from corpses, sick animals or sick persons, excreta and decaying vegetable matter (51). In the Industrial Revolution and its associated slum development, smells from excreta and overcrowded churchyards made the whole district offensive. These odours were considered to be the cause of epidemics. The causes of the odours were termed nuisances and the removal of these was the object of Chadwick and others.

The British Medical Association, formerly the Provincial Medical and Surgical Society.

Also in 1841 Laycock had written two letters to the Dublin Medical disagreeing with Dr Hastings on the management of the Provincial Medical and Surgical Society, firstly criticizing the way the meetings were called by Mr Husband and in the second letter accused Hastings of being the dictator of the Association. Charles Hastings and some colleagues travelled to York for a meeting in August 1841 and a new branch of the Association, the East York Medical Association was affiliated. At one session of the meeting tension developed between Hastings and Laycock who considered the Council not representative. Hastings replied "it is not my fault that he (Laycock) has not been put on the Local Council for York" (52). Laycock considered Worcester was trying to tell York what they should do. He resigned from the Association but eventually the differences appear to have subsided, for Laycock rejoined as a member of the Association in 1855 (53) and Hastings gave Laycock a testimonial, even if not one of the most enthusiastic, for the appointment of the Chair of Medicine at Edinburgh. The Provincial and Medical Surgical Association met at York on the 15th August 1855 for the last time under that name. Laycock noted that old struggles were renewed, Hastings and Husband were victorious but they yielded all and dissolution of the old Association

occurred (54). The meeting must have been a contentious one involving a change of name. Laycock observed he would vote for the Association being called British, even if only to go to London and "rouse up the London practitioners with a meeting".

The editor of the Association Medical Journal, J.R.Cormack wrote:

We deplore on public grounds the result of the York meeting in as much as they destroy our cherished hopes that the existing Association might become a catholic and representative union of the entire British medical profession. On personal grounds we might offer complaint. We forbear, however, because although unthanked, assailed and defeated we are neither dishonoured or dismayed. (55).

Medical Act 1858

The registration of suitably qualified medical practitioners in 1858 have been advocated by the profession for many years. Laycock not only supported registration but actively wrote promoting it. His suggestion for the suppression of "quackery" as a function of the medical police has already been noted.

In 1842 he regretted that the list of members of the "London College of Surgeons of England" was incomplete as many had neglected to supply the necessary information for an up-to-date list. This was necessary for the voluntary organisation of the profession to which he thought events were unquestionably pointing. A complete union of all grades of practitioners into one body would enable the profession to take its rightful place in society.(56)

Twenty of York's qualified medical men, including Laycock, petitioned the Home Secretary in 1849 complaining that the agenda for medical reform was being set by London's physicians and surgeons. In the provinces no differences existed in the

various grades of practitioner: both physicians and surgeons were in effect general practitioners.(57)

Eight years later Laycock observed that loss of time and labour, unpleasant discussions and the weariness of hope deferred, the question of medical registration had become an unbearable nuisance. He was writing on a proposed Bill by Mr Headlan to which Laycock objected on the grounds that practitioners were deprived of civil rights, e.g. recovering fees in law and he objected to the means whereby the profession was pay for registration. (58).

Laycock's activities in political medicine are not reasons for which he is remembered today, yet they were not inconsiderable especially in relation to the City of York.

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CHAPTER 6

PSYCHIATRY

This chapter shows the extremely wide range of Laycock's writings and interest in psychological medicine.

He repeatedly makes it clear that for him insanity is essentially a matter of cerebral pathology. When reviewing a work by Professor J. Guislain of the University of Ghent (1) Laycock claimed that insanity should be defined as "a chronic disorder of the brain by which the mental condition of the individual is so modified that he is deprived, wholly or in part of common sense."

The introductory lecture for the third course of summer lectures in psychological medicine delivered in 1861 at the University of Edinburgh (2) by Laycock stated that for the medical student the subject was divided into two parts, the principles of medical psychology and their practical application to corporal and mental diseases. However the principles were to be of general application in human affairs and particularly relevant to the clerical, legal and scholastic professions. Originally Laycock planned for the attendance of these professions, but he was disappointed and had therefore made the third course purely medical; but in spite of this examples were given in which some knowledge of psychology would have been useful to teachers, the clergy and those involved in the administration of criminal justice. The fundamental principles of Laycock's teaching in medical psychology were;

1. Its object was living man; that is as he existed on earth and not as a disembodied soul or as thinking, feeling and willing independently of his organisation.
2. Its object was man in all states of consciousness whatever, and not restricted to those in which he acted as a thinking

rational or intellectual being. Insanity and conditions thought of as hysterical were thus included.

3. Medical psychology affirmed its fundamental principles of physiology, that no change whatever arose from the consciousness without a change or series of changes to the organism. i.e. diet, drugs and climate could effect thought and behaviour.
4. While it was affirmed as a fundamental principle of physiology that changes in the organism necessarily coincided with mental changes, it was not materialistic.
5. The unity of the phenomena of life and consciousness in man implied a unity of forces and laws.

This principle was expanded to show that in biology and psychology it applied throughout the animal kingdom where much could be learned by the study of behaviour and physiology. Indeed the right approach was not to start at the top with man but to learn from comparative anatomy and to go to the bottom of the scale.

Essential to Laycock's teaching was that man's mental, social and spiritual life were as much part of his concern as bodily ills. Many of the questions raised about man's social and spiritual life and the mind brain relationship are doubtless very significant philosophically although in the way Laycock treated them not subjects a patient wishes to discuss when consulting a physician. Two great principles of biology and psychology were firstly a primary consciousness of being one, i.e. the "Ego" of metaphysicians. This law of unity of many parts was not only a law of life but of all creation. The second principle was the law of self-consciousness, "in virtue of which the individual not only feels as one, but also as not being another".

His repeated affirmation that he was not ^amaterialist was required, as at that time it could be socially and professionally hazardous to be labelled materialistic owing to the intense conflict between science and religion.

He then went on to relate his principles of philosophy and theology. It may well be that it was the first three of his principles which put off some clergy, teachers and

members of the judiciary from attending his classes, as they would have considered mind as a separate entity in its own right and responsible for human behaviour.

The introductory address ended by saying there would be opportunities for observation of the insane at a large asylum when students could test the application of the principles taught to the mentally ill. At the Infirmary students could apply the same principles at the bedside of the sick, and at the end of the session, the students were to be invited to examination to test their knowledge in the principles and practice of psychological medicine.

To what extent medical psychology was practised in Laycock's ward in the infirmary is dubious; an examination of ward notes of those patients under Professor Laycock's care does not show, in most cases of physical illness, any significant concern with medical psychology although a full personal history was recorded. It is impossible to do full justice to every aspect of Laycock's psychiatric writings but the following are significant.

Administrative psychiatry

A contentious subject at the time was the extent to which restraint might be permitted and Laycock wrote a paper (3) in response to a circular addressed to asylum superintendents on the subject by the Commissioners on Lunacy requesting information on the use of instrumental restraint or seclusion. Two contrasting replies were quoted, firstly from Bucknill, a well known psychiatrist and superintendent of the Devon Asylum, who advocated seclusion for two purposes. firstly as a remedial agent, as he had noticed many patients improved when confined to bed for some incidental physical cause, and secondly when there was a danger of the patient inflicting physical injury to other patients. Contrasted with this was the view of Hugh Diamond of the Surrey County Asylum. who claimed seclusion was never necessary and asserted any person

who now used seclusion to the extent Bucknill had, was unfit to be an asylum superintendent.

John Conolly, the author of a book on Treatment of the Insane Without Mechanical Restraint gave evidence from Hanwell to the Commissioners in Lunacy that no form of mechanical restraint was employed with his knowledge or sanction in 1854 but conceded the supervision of attendants in large asylums was always inefficient. The majority replies indicated that seclusion or restraint was seldom used and the Commissioners themselves agreed with a qualified and minimal use of seclusion and restraint.

Laycock concluded it was easy to minimise seclusion by the excessive use of morphia or cold douches. The physician must not be guided by an abstract dogma but in every case use his own judgment as to what was best.

When reviewing a book entitled Articles on Reform in Private Asylums by Henry Munro,(4) Laycock deprecated the fashion to decry the efforts of private institutions in the treatment of the insane and he pointed out that while abuses may and do exist in private asylums, the greater number of improvements in the condition of the insane were proposed and partly carried out before the Commissioners of Lunacy existed, and he considered the intrusion of a Public Board into matters within the legitimate sphere of the profession a growing evil which could inflict a mischief on society. A difference in opinion on the question of restraint was an important one as American psychiatrists believed in the propriety of mechanical restraint for the treatment of insanity (5). It must be remembered that Laycock had a personal interest in a private mental hospital to which he referred in his first address to the Lord Provost and Patrons of the University of Edinburgh (6). He was physician to the Gate Hemsley Retreat (7) a private mental hospital with nearly one hundred beds.

Gate Hemsley was only a few miles from York and in 1839 a James Martin applied to the North Riding Michaelmas sessions for a licence to keep at Gate Hemsley a house for the reception of fifty-eight insane persons, thirty being pauper patients. At the Michaelmas sessions of the following year James Martin applied for an extension

of his licence to ninety-eight patients, forty eight being paupers. The house had been enlarged and plans were submitted. (8). A visit by Commissioners in 1842 noted there were seventy-eight patients and that three female and one male patient were under restraint. It was recognised the cases were severe ones, but considered there was insufficient recreation and amusement. In general reports by Commissioners and visitors were satisfactory, Laycock being appointed a visiting physician in 1849 and continuing so until he left for Edinburgh in 1855. Nothing is known of his remuneration for duties at Gate Hemsley.

Thomas Laycock was not the only person of that name connected with the Gate Hemsley Retreat, for one of the official visitors was Thomas Laycock J.P. The latter resided at Fishergate House, Fulford and he must have been a wealthy person, as his house was large and imposing and built for him (9).

The defence of private mental hospitals indicated a divide of the time between those in public asylums and those in private mental hospitals.

Forensic Psychiatry

Laycock's interest in forensic psychiatry was not a mere academic one as in 1864 he appeared for the defence of a jealous and violent young man George Bryce, who was charged with the murder of a young woman. Laycock considered Bryce to be a weak individual who had been cared for at home and gave as evidence for his mental weakness, facial asymmetry and features of the skull which resembled that of an idiot. Laycock further thought that at the time of the murder there had been genuine loss of memory as in delirium or epilepsy. The Court was not impressed with Laycock's evidence, as Bryce was found guilty and executed. Laycock's opinion on the loss of memory arose partly from his extending reflex function to include the brain. As one commentator wrote

Conolly asserted that a lunatic's morbid feelings 'appears in

some cases to be as little within the control of the patient as the muscular movements are in a fit of hysteria or epilepsy.' Laycock translated this medico-psychological common place into a neurophysiological conclusion with an objective foundation. (10)

The Court's point of view was given by the B.M.L. (11) in the following words:

The public saw in the case of Bryce the ordinary chain of circumstances, revealed in trials for murder. A man of degraded mind, given to vicious habits, of uncontrollable temper, suspects from certain circumstances, that he is the object of the ill-will of another person: and after meditating over his crime for some time he carries it into effect.

At the end of the summer course of lectures on medical psychology for 1864 Laycock discussed the case of Bryce and indicated anomolous conditions of the law as he saw it. (12). Laymen were being asked to judge whether the accused was insane at the time the act was committed to the extent that relieved him of responsibility. Insanity was not legally equated with irresponsibility, only when it was to the extent that a subject did not know right from wrong. In Court Laycock differed from the Solicitor General on the nature of evidence from medical witnesses. Laycock said he thought he was present to give an opinion on the facts of the case, but the Solicitor General replied "you are quite mistaken, doctor, you are entirely here to give opinions on assumptions, you are not here to give opinions on facts."

Laycock thought medical juries should be used to determine medical questions like that of Bryce and in all cases of murder, the responsibility should be fixed somewhere. If a prisoner were found irresponsible, the blame should be on those who fail to have him restrained and controlled as a lunatic.

In 1868 Laycock addressed the annual meeting of the Medico-Psychological Association on the place of medical science in the administration of justice and the

prevention of lunacy and crime (13). After the discussion of some of the differences in criminal law in various countries, Laycock drew attention to the old Roman notions of furiosity or raving madness as the measure of irresponsibility. If there was some coherence of ideas, the case was held to be one of partial insanity; this dictum of a Lord Chief Justice Hale had become virtually part of the law of the United Kingdom. This however was to change when the Law Lords considered the case of McNaughton who shot the secretary to the Prime Minister, Sir Robert Peel, who was the intended victim. The Lords' ruling which became known as the McNaughton rules stipulated a man could not be judged insane if at the time of a criminal act he knew right from wrong.

This Laycock thought was an unsatisfactory position as in insanity... the conduct often depends not on what a man knows in the abstract but what he remembers at the moment,... a state of mind no one, nay not even the individual himself, can give evidence except as to mere probabilities.

The problem of the will, voluntary action and knowledge about action continues to be a difficult issue between law and medicine, as behaviour is increasingly conceptually seen as deterministic while perceptually it is voluntary. Laycock considered a class of persons existed termed moral imbeciles who bred others like themselves; although capable of self control they did not exercise it, and therefore had to be punished to deter others. It was necessary for them to be treated with Christian forbearance and charity but since they lacked control had to be prevented from producing others of their kind.

At the close of the meeting Laycock asked for a committee to be set up to advise the Government on the administration of the law in relation to mentally disordered or defective persons.

There is no evidence that a Royal Commission was set up at that time but a deputation from the Medico-Psychological Association appeared before the Lord Advocate for Scotland (14). Laycock spoke of mentally limited criminals who were not capable of self control and of a need for stricter definitions in relation to mental

disorders. Professor Maclagan said medical evidence was very reliable on clinical and scientific matters, it was only in psychiatry it appeared unreliable. Dr. Browne (father of Sir James Crichton Browne) thought crime was often a matter of heredity.

The Lord Advocate replied that he had also been impressed that many criminals were of low intelligence, but he was unsure to what extent lack of intelligence excused punishment. He pointed out that the deputation had not indicated exactly how the problems were to be solved nevertheless he would bring their views to the notice of the Government.

In much of his writing on crime, poor intelligence and heredity Thomas Laycock, with others, prepared the ground for the eugenics movement which followed later. The arguments of nature versus nurture have only recently given way to study of gene/environment interplay.

Classification

A perpetual concern of psychiatry has been classification and in 1863, marginally before the work of Kahlbaum and certainly before the influential work of Emil Kraepelin (1883) Laycock published a paper on the subject (15). He described many difficulties which are still discussed and started by questioning the need for naming and classification but considered, however, that such was required and "hence it follows that naming is no mere ingenious exercise of the intellect but a procedure of the greatest practical importance." The difficulties inherent in the situation were fully discussed and he felt the Anglo-Saxon tongue was unsuitable for classification as "originally it expressed nothing more than a wide experience." Certain scientific and technical items came from Greek, were universally taught and therefore presented no difficulty. In spite of the remarks about Anglo-Saxon, Laycock thought German to be a language more suitable for a developing science.

Although there were manifold difficulties for psychiatry in classification, Laycock said this is not a unique situation and wrote

I can affirm confidently that the naturalist is unable to state beyond cavil what characteristics of a plant distinguish it from an animal. In medicine itself we find difficulty with words like health and disease; we cannot define in unexceptional phrase what life itself is.

In this he recognised the difficulty of putting commonly accepted classes and thoughts into scientific language.

The paper continued by pointing out absolute standards were impossible but always relative; the present state of a man had to be considered in relation to his past behaviour and many other factors have to be taken into consideration

If we further analyse this standard as applied to the naming and classification of mental diseases in general, we find it includes attributes or qualities of the individual in common with others of the same age, sex, race or social position..... Some persons perpetrate eccentricity which if done under other circumstances, or by others of greater solidarity of character or position would indicate unsoundness. And also with conduct and customs of races as well as ranks.

In all this Laycock was surprisingly modern in insisting that in psychiatric conditions, it was essential to take into account the cultural and ethnic background of the patient. This also applied to his reference to age, although he did not go further and indicate the need for a special psychiatry of old age and of childhood.

Classification of mental defects or degenerations were seen with reference to an ideal in facial appearance and bodily form. Physiognomy by this time embraced racial and social characteristics. Laycock wrote

In as much as the European passes during uterine and infantile life through stages of form which are adult characteristics of other races as the Mongolian and African.

This must appear surprising as Laycock's paper was written in 1863 and Langdon Down's classic paper on "Ethnic classification of Idiots" was not written until 1866. (16) It may be, that as Hunter and McAlpine suggest, the concept originated with John Conolly who started thinking on ethnological lines following the exhibition of a pair of microcephalic subjects in London who appeared to him like American Indians (17). The concept of racial evolution however was common at the time. Robert Chambers had written in 1844

Attention has lately been attracted by a curious physiological speculation, having as its object to show that some broader features of the great families of mankind are expressly connected with the principle of development. It points out the brains of one of the most favoured specimens of humanity, after completing the series of animal transformations, passes through the characteristics in which it appears in the negro, the Americans and the nations of Northern and Eastern Asia (sometimes called Mongolian). The face partakes in these alterations It appears in short the various races of mankind are simply representations of particular stages in the development of the highest or Caucasian type (18).

In mania, in moral insanity and in imbecility, morbid manifestations of appetites, instincts and propensities were seen as degenerations or reversal of the evolution of social behaviour because the conduct seen was normal in early childhood or in lower animals. Stealing and hoarding was seen as a disease and a degeneration in man, yet it was a characteristic of magpies.

Basically Laycock considered the phenomena to be observed, classified and named were twofold, states of consciousness and actions, and he ended by observing that the process termed diagnosis was, in psychiatry, nothing more than determining what name shall be given to a case under observation. There was no morbid anatomy to correlate with symptoms but any scheme of classification should help the practitioner to discriminate the various forms of mental disorder and to appreciate their aetiological relationships and natural history. An extensive classification was given in a new part two of the second edition of his book The Principles and Methods of Medical Observation and Research when Laycock wrote on "Nosologies and Indexes of Mental Diseases and Defects (Vesaniae)". The term Vesania had been used by Linnaeus and incorporated by Cullen into his class of neuroses (19) to denote any kind of mental illness or deficiency. For Laycock vesanic or mental diseases and defects were diseases of the encephalon which were classified along various axes.

1. Symptomatic - mental disorders and defects which occur as symptoms of other diseases.
2. Transitional - the earliest stage to mental illness or defect.
3. Idiopathic mental diseases or defects which are of two kinds, insanity and fatuity.

The various types of insanity had both psychological and biological aspects and Laycock listed these as follows:

1. Oretic insanity, an abnormality of the encephalic centres serving instincts and animal desires.
2. Thymic insanity in which there are abnormal feelings or sentiments caused by disease or disorders of encephalic centres serving feelings.
3. Phrenic insanity in which there are disorders of intellect and understanding due to disease or disorders of encephalic centres subservient to knowing and representative faculties.

Three types of fatuity (silliness) were listed.

1. Congenital due to abnormalities of the encephalon arising in embryonic life and these may vary in severity.
2. Consecutive fatuity, loss of mental powers due to any other encephalic disease or to insanity.
3. Insane fatuity, insanity occurring in the weak minded and chiefly oretic or emotional.

The idea of the mentally deficient being also mentally ill was a concept which was only developing about the time of Laycock's writing. Further the course of the illness may vary, acute, chronic, paroxysmal etc. In all seventeen pages were devoted to the classification, much of it similar to chapters on "Mental Physiology" or "mental organicity" in volume II of Mind and Brain.

Surprisingly the idea of psychosis is not mentioned although von Feuchterleben's work was translated and published by the New Sydenham Society in 1847 and von Feuchtersleben was known to Laycock since he quotes a remark by him in his 1854 paper on "Latent causes of Insanity". A letter to the Dublin Medical Press in July 1840 (20) headed "Epidemic Neurosis" referred to an outbreak of apoplexy following oliguria and there had been a concurrent epidemic of scarlet fever. Neurosis had a special meaning for Laycock, a theme he developed much later and involved the nervous system in pathological tissue changes. (This is more fully considered in chapter 8). Psychiatric history involving classification can be very misleading as words change their meanings. Berrios (21) has given an account of the change in meaning of dementia. Melancholia and mania have changed and some names such as phrenitis have dropped from use.

Hysteria and malingering have been considered in Chapter 3: a paper on hypochondriasis by Laycock was written in 1846 (22) and based on a lecture to the York Medical School. He applied his oft repeated neurological explanation to abnormal mental states and behaviour; there was a functional disturbance in some portion of the encephalon. This may depend upon excitator actions from the sympathetic

system or the functional abnormality may have a centric origin caused by mental operations.

Students were advised how to manage hypochondriasis.

Never say to a hypochondriacal patient - 'Pooh you ail nothing, it's all fancy, you're nervous'. His sensations will flatly contradict your assertion and he immediately draws the conclusion that he is not safe in your hands.... if they (Hypochondriacs) change their doctor be thankful that you have got rid of an annoyance: if they do not, do your duty firmly but affably.

Laycock believed common quacks obtained their patients principally from hypochondriacs.

Causes of Insanity.

The causes of insanity were considered by Laycock in terms of environment, including the bodily organs but in all cases these are seen in terms of neurophysiology even when the environment was recognised as a dominant factor.

Having repeatedly stressed abnormality of the brain as mental illness, it might be expected that autopsies would produce some important findings. This was recognised by Laycock.

The eye of the microscopist has penetrated to their ultimate organisation and disclosed the caudate vesicle, nucleus or cell; the scalpel of the anatomist has traced their connexions with each other fibre by fibre; the test tube and the scales of the chemist their bio-chemical composition; the researches of the pathologist have shown

how often morbid changes in structure or chemical composition accompany marked changes as functional activity; and, we must add how often they do not.(23).

This is a very early use of the word bio-chemical by Laycock.

The absence of morbid anatomical findings in insane patients was one of the major puzzles for the Victorian doctors as it has been since. Laycock saw no answer and considered that if the changes associated with chemical, electrical or magnetic phenomena were not known "how much less can we know those which occur in organised matter?" By organised matter was meant the physical organisation of the brain.

In the cases of insanity observed, there was only a dynamic change analagous to that of health. A manifest change in the "instrument of mind" could only happen with abolition of mental faculties, (i.e. dementia); in true insanity the faculties were only perverted and not abolished. This is largely true, as neuropathological changes are expected in dementia but not psychosis. . All manner of influences entered into a reciprocal action between body and mind and between organism and organism; these are mediated via the nervous system and constitute sympathies which have a large share in cerebral disorders. Laycock appears to have been unique in involving sympathies in psychiatry and wrote a paper "On some of the latent causes of Insanity" (24) which was prompted by a book Leçons Clinique de Médecine Mental by M.Fahet and published in Paris (1854). The paper opens with

The entire universe, according to transcendental speculations is a unity in which all the parts are related and mutually dependent. A remark by Feuchtersleben may be quoted as an illustration of one department of this mutual dependence: 'could we penetrate into the secret foundation of human events, we should frequently find the misfortunes of one man caused by the intestines of another whom the former

endeavoured to inspire with sympathy in his fate at a moment when the frame of mind of the latter was affected by impeded secretion. An hour later and his fortune would have been made.'

Laycock said he intended to trace the origin and progress of some of the "sympathies" and investigate their relation to insanity.

Reflex function might be unconscious at the cerebral level; portions of the nervous system could act independently of mind and Laycock explained various sympathies as he saw them giving pride of place to blood sympathies as blood was the medium of nutrition, repair and excretion. If the blood nutrient material was deficient, hunger was experienced; when appetite satisfied and the end gained the chain of sympathies was completed; but if appetite was not satisfied actions could become impulsive and instinctive. Laycock considered abnormality of cerebral function in this sympathy could result in anorexia on the one hand or bulimia, polydipsia and pica on the other.

Visceral sympathies were in two groups, firstly the blood and organs which circulated it and the organs which broke it down. Sympathies of the heart and lungs had profound implications for existence; any attempt to interfere with respiration was met with violent resistance and intense feelings of anguish and restlessness accompanied cardiac disease. There need not be structural change in the heart but changes in innervation could excite morbid sensations. Laycock said that in his early life he thought the symptoms of coronary heart disease resulted from a cardiac neuralgia.

It was possible, thought Laycock, that in cases of mania, melancholia and hypochondriasis with some kind of cardiac abnormality, the sequence of events could be initial enfeebling influences of mental origin which acted through the nervous system on the heart and by continued interplay between heart and brain cerebral or cardiac disease developed. "Excessive study, exhaustive amatory indulgence and strong emotions such as anxiety, grief and fear had a direct influence on the heart and lungs." Processes applicable to the heart and lungs could be applied to any sympathy which

concerned the welfare of the individual as it was from self preservation could spring, not all, but some forms of monomania with delusions and illusions. It was extraordinary that Laycock should use the word illusions as these had been separated from hallucinations by Esquirol (25). The term monomania was one that gave rise to many difficulties. It originated with Esquirol about 1810 as part of a classifying system (26) but eventually underwent several subdivisions before falling into disuse.

Although insisting on a neurophysiological basis of mind and insanity Laycock was happy to incorporate psychodynamic processes. The hypochondriacal patient might remain all his life with a groundless anxiety for his health but could easily pass into other stages with his instincts perverted and then suicidal impulses developing. Or the disorder may extend from the more simple instinct of self conservation, the idea of something injurious acting from without might occur; he may suspect mysterious agents such as electricity, witchcraft or the anger of a deity. He might even think he was being poisoned, connect some individual with this action and become homicidal, or again he may feel helpless and develop melancholia.

An important qualification to the above was made by Laycock

now we do not intend by any means to insist that in no case do the symptoms spring from ideopathic cerebral disease: on the contrary we think that instances of that kind are constantly met with in practice: all we urge here is this, - that morbid innovation and disordered function of the heart, lungs and other viscera may have a dynamic effect on the instinct of self preservation: that a play of affinities between the cerebrum and viscera is thereby established: that from the morbid development of this instinct and other changes in subordinate instincts radiate as from a common centre and that finally the whole of the co-ordinating apparatus is involved in a chain of morbid causation.

All the sympathies arising from the viscera initially acted by changes in the blood and although the question of the place of the colon in insanity was debated "copious evacuations of a offensive accumulation in the intestinal canal have been followed by the happiest results".

Sympathies of the reproductive organs constituted a special group as they could override those of self preservation. Monomaniacal cunning in human females like hysterical cunning was a morbid instinct resulting from ovarian sympathies. Kleptomania was a related condition and could occur in conjunction with hysterical or monomaniacal cunning.

These were all latent causes of insanity because they would lie dormant until suitable stimuli were applied. The paper as a whole starts a theme that was later to be developed in Mind and Brain, the interaction or sympathies between mind and matter, between man and man and between varying parts of the body. The paramount sympathy was that between mind and brain.

After a few years and further contemplating some of the philosophical problems in his development of brain as the organ of mind Laycock came to consider consciousness (27) which was of central importance although his ideas of consciousness were controversial. In dreaming most absurd and incongruous situations arose which at the time seemed real. An analogous condition occurred in induced somnambulism, Mesmerism and spectral illusions (hallucinations) where a disorder of the vesicular neurine (gray matter) was transitory. In the delusions of the monomaniac they are permanent; it was the persistent condition of the abnormality, which constituted insanity. Erroneous states of consciousness probably occurred at many moments of our wakening lives but we depended not on one sense, but the constant mutual control and correction by several senses, a process destroyed in dreaming and in other abnormal states of the cerebrum. Sometimes the detection of delusions was difficult because the patient had enough insight to conceal them. but at other times he was powerless to do this.

Other abnormal states of consciousness and clinical symptoms were also due to abnormalities in the vesicular neurine. Thus neuralgia depended on a morbid state of a nerve or ganglia. Melancholia was a higher morbid state involving an intellectual level in which evil was anticipated or believed to have occurred.

Although like neuralgia in some respects in that there was a morbid neurological state, it resembled more closely a dream in which everything had gone wrong.

The state of consciousness induced is precisely antagonistic to the aims and objects of the principle of intelligence which is happiness, and to that experienced in the normal condition of the neurine; hence it is that things pleasurable naturally become changed in their effects.

In hypochondriasis, like neuralgia, there were sensations of morbid states of the skin or viscera, and these again were related to delusions as to what may be termed the anatomy and intimate construction of the parts of the body. This also occurred in melancholia "Melancholic patients will assert they have no stomach, no bowels, no head, no soul."

The same abnormality changed instincts and modes of thought

The trembling melancholic - who expects and dreads his death, flies from the most trivial things, in terror of death at every moment - becomes profoundly suicidal. The transition from a morbid condition of this kind to that in which the active instincts of defence were aroused was a natural and not infrequent occurrence, so that the suicidal is often a homicidal maniac; or else the nutrient instincts are involved and the hypochondrical dread of being poisoned passes into the maniacal determination to take no food, or to take poison.

A question often debated in the early nineteenth century concerned a possible increase in insanity, a problem considered at length by Esquirol and taken up by

Laycock (28) in 1852 when reviewing a book by a well known American physician Edward Jarvis on The Overworked Mind. Jarvis had a great interest in psychiatry, social reform and statistics and in 1860 met Laycock when he visited Edinburgh (29). Laycock considered the wider spread of literature and science, the greater extent of commercial enterprise, the greater amount of political action and the freer discussion of religion were causes of a much higher degree of mental activity. Further improvements in the education of children and youth had imposed more burdens on their brain than in former generations. Overwork was an extremely common diagnosis among Victorian doctors treating nervous disorders. one of the most common conditions of the time (30). Insanity, pointed out Laycock, not only resulted from the overworked mind, it could be also an important beneficial influence on writers, statesmen and the general mass of society. However insanity in the literary man did not invariably result from the overworked mind, as Byron had, as a child a sullen passionate temper, probably inherited from his parents, so it was not remarkable that he fell early to a fever which chiefly affected his cerebrum. Laycock discussed the narrow margin between insanity and genius.

The chief result of mental overwork was melancholia which may lead to suicidal impulses. Students even in the nineteenth century were well known to be at risk for overwork with adverse results. If the effort needed for first class results did not produce insanity, the student may nevertheless be affected and for the rest of his life and never fulfil his early promise.

The remedy suggested for those engaged in intellectual toil was to look after their bodily health, to take sufficient exercise and not to work all the year round. However if holidays were too great a luxury then the evils of overwork may be warded off by diet, a strict regimen and varying from time to time the subject of studies. It would not seem Laycock practised his own advice to any great extent.

Treatment

Laycock's views on treatment were in general moderate and in keeping with the thoughts of his time. Opium and hellebore were mentioned but he laid no great stress upon drug treatment in insanity. Treatments such as immersion in cold water or the use of the rotating chair were not specifically discussed by Laycock but it would appear from his writings on restraint he was opposed to these, although in certain cases he would permit cold douches.

As well as sympathies giving rise to mental illness, Laycock thought they could be used in the treatment of those conditions. The instincts in relation to love of offspring or the opposite sex could be used therapeutically in asylums by the introduction of children and holding balls and concerts.

Imitative sympathies could be used by placing inactive patients among those engaged in various occupations and sooner or later the desire to imitate the workers would arise. Perhaps country life or rural scenes exercised a beneficial influence by reviving sympathies with nature which were rarely absent. In the great asylum building era the vast majority were situated outside the towns and invariably had their own farms.

Memory and its organic defects

In his paper of 1875 (31) Laycock attempted to incorporate ideas of brain reflexes into memory and its psychiatric disorders and said that in doing this he made the basic assumption that consciousness of any kind indicated a physiological condition of the encephalon a statement still necessary at that late time. He then proceeded to quote Sir William Hamilton, the Scottish philosopher, who by introspection found memory consisted of two processes. Firstly a great amount of knowledge was retained of which the subject is unaware, and secondly this knowledge has to be recalled to consciousness. Loss of memory usually meant loss of ability to recall.

Next Laycock applied reflexes to memory by distinguishing both motor and sensory parts located in the brain. Within the brain itself there was the retentive part (called "synetic" by Laycock) and there was also the part needed for recall. Synesis was a word adapted from the old Greek after consultation with classical friends (32). Further there was also a part of the brain necessary for the association of ideas and a motor part which expressed thoughts or feelings by actions. The pathology of memory must distinguish these various parts.

Going further with the mechanism of retention Laycock recalled that long ago he noticed the similarity between spinal and brain reflexes and considered that both involved some special molecular constitution of memory and motor centres. Others had used material ideas to explain the organic basis of reflexes, but this was quite invalid since ideas are not material and the word substance, used by metaphysicians to express an immaterial basis of mind had come to mean something quite different.

The organic basis of reflexes also had an evolutionary foundation, those reflexes being conscious were 'ideogenetic' and those subservient to motor action kinetic. New ideas and knowledge developed and were based on a complex situation. To stress his point Laycock says he had repeatedly pointed out how brain reflexes differ from material ideas, firstly in an appendix to his 'Reflex Function of the Brain' (33) and secondly in his review of Unzer's Erste Grunde (34).

The mechanisms of memory were the last to evolve although there was a continuity of some kind as described by Darwin in the Descent of Man (35) and the law of continuity applied to cerebral changes. Darwin wrote that the bodily structure of man showed clear descent from lower forms; the differences in mental abilities were so great that some considered man could not have evolved. Although Darwin recognised this enormous gap, no fundamental difference existed between man and higher mammals in their mental faculties. He then proceeded to examine various mental divisions and thought it superfluous to state that animals could have good memories. At one time he had had a dog who was savage and adverse to strangers and Darwin tested his memory after an absence of five years and two days. He then went to the stables and shouted his

name in the old manner, "the dog showed no joy but followed and obeyed as if they had been parted on half an hour before". Laycock pointed out the brain of each individual changed from infancy to maturity; reversion of this only occurred in morbid states.

The theory of degeneracy as a cause of disease in general and psychiatry in particular became popular in the mid-nineteenth century. The theory originated with Benedict Morel and was the result of many influences, the physiology of Claude Bernard, the anthropological studies of Gall and Flourens and a small group who attempted to combine political radicalism and new secular knowledge with Catholicism. Morel defined degenerations as "deviations from the normal human type, which are transmissible by heredity and which deviate progressively towards extinction"(36). This concept was applied both in psychiatry and general medicine, was consistent with Darwinism and was accepted by Thomas Laycock although seen as an example of reversed evolution.

At the end of his paper on memory Laycock wrote

There can be no more difficult problem for enquiry than the transmission of ancestral organic memory; but I believe it will never be solved so long as inquiry is turned to merely mechanical arrangements of the nerve centres to the exclusion of vital dynamics. I have elsewhere endeavoured to show that the cephalic synthesis upon which organic memory depends and the genetic synthesis necessary for its hereditary transmission are both dependant upon energy stored up in the cerebellum, and that the amount of this energy, as influenced by blood supply and other trophic conditions of the organ, influences in no slight degree the evolution of the faculties and vigor of memory. Referring to my published views and to these functions of the cerebellum, I will now subform illustrative cases.

These with Laycock's comments are briefly summarised.

Case 1:

A stout young marine engineer who presented with his wife on account of complete loss of memory, had fallen into the ship's hold striking the back of his head on some hard object and since then had a complete loss of memory.

On examination he had complete use of all limbs, no strabismus or facial paralysis, no incontinence but a facial appearance of absentmindedness. He could remember events prior to the accident going back for years but he could not remember whether he had arrived at the hospital by tram or bus. His speech was slow and precise, he could read correctly but he could not say what day of the week it was, or what he had had for breakfast. Laycock suggested shaving the occipital region and the application of iodine liniment and a mixture of potassium iodide and quassia prescribed. When next seen he was much improved and told to continue the treatment but he failed to keep any more appointments.

According to Laycock the patient lacked attention which involved lack of perception and those processes which involve synthesis; the blank expression was also seen in cases of dementia and idiocy. On the motor side actions to give affect to thought required motor co-ordination by reflex action in the cerebellum together with their sensorial connection in the sensory ganglia and hemispheres. In this patient either the sensorial impulses from the hemispheres or the impressions derived from external things were too fickle to excite the cerebellum. A serious anterograde amnesia, as in this case, is usually the result of diffuse brain damage and carries a poor prognosis.

Case 2:

An Irishman of about 30 presented with his wife who had complaints about his general mental state, especially his memory. In the previous autumn he had a mental attack in which he became very excitable, with delusions of grandeur and was placed under the care of the County Asylum, where when treated with choral, potassium bromide and digitalis he quietened down. Since then his behaviour had been childish, he could not remember where he put things and if reading, forgot instantly the subject matter of his reading .

The right pupil was dilated, he had right sided face and head ache and there was some anaesthesia over the area. A few weeks prior to the mental illness his horse had fallen when hunting, and the patient also fell striking his head; he was unconscious for a short period but later was in normal health. Laycock recommended shaving the occipital region, the application of liniment of iodine and tincture of digitalis administered orally. At first he improved but later his medical attendant wrote from Ireland to say that a progressive right hemiplegia developed, epileptic attacks and a progressive dementia; the patient died just before Christmas.

Laycock commented he doubted if the insanity and dementia were wholly due to the fall, although it was a fact of experience trivial injuries to the occipital region could be followed by serious results. Sometimes there were predisposing factors such as drunkenness or a drunken parentage, syphilis, sun stroke or a previous head injury.

In this patient the contracted right pupil, the localised pain and anaesthesia with loss of memory clearly pointed to "basilar mischief which might readily become progressive both in the cerebellum and its sensory ganglia, and in the frontal lobes or hemisphere."

It is likely this man had a subdural haematoma which is common in alcoholic subjects following head injury, and as mentioned by Laycock syphilis is another possibility.

Case3:

A 53 year old male of intemperate habits was admitted to the Royal Infirmary under Joseph Bell with a wound in the occipital region sustained in a fray, Bell asked Laycock's opinion.

On examination his pupils were equally contracted and fixed, the muscles of the left arm showed some rigidity, and there was left facial palsy although he could shut his eye. The following day he could give his name, questions were answered slowly, usually by yes or no and he was incontinent of urine. Counter irritants were applied to the occiput and he was given as a medication tincture of digitalis with ginger. His intelligence improved, but his articulation was indistinct and he was often half awake

muttering to himself. Later the left arm was normal, his facial palsy almost disappeared, he could speak better but had lost his memory for recent events although he could recall events of some years previously with accuracy. Some fortnight later because of slow improvement it was decided to blister his temples and to give a tonic of strychnine and iron; he then improved rapidly although his left pupil dilated and remained the same until his discharge some two weeks later.

Laycock remarked that although this man improved he was far from healthy at the time of his discharge and in view of his intemperate habits had a bad prognosis. It was probable both "local and basilar symptoms were manifest and in both it is probable the cerebellum and its sensory ganglia were shaken." Virtually all cases of concussion have some degree of retrograde amnesia, but the extent and severity in this patient would indicate brain damage. Chronic alcoholism would certainly make for a poor outcome.

A quarter of a century later the neurological examination would have been much fuller with tendon reflexes observed and the pathological significance of clasp knife rigidity, hypertonia and hyper-reflexia realised and the plantar reflex examined. By basilar symptoms Laycock was vaguely indicating some malfunction at the base of the brain.

Religious Insanity

In the late eighteenth and early nineteenth centuries, great emotional turbulence at religious meetings, especially among the Weslyans or other non-conformist sects was common and it was considered this could lead to insanity. Laycock gave this as a reason for clergy attending his course in Medical Psychology (37) and said that Dr Gilchrist, superintendent of the Southern Counties Asylum reported five persons in the Institute who had become insane as a consequence of excitement at "revival" meetings and he had seen other cases in the last twelve months from the same cause. Dr Gilchrist indicated that all cases came exclusively from certain localities where the clergy placed

no restraint upon religious excitement which the meetings engendered but rather encouraged it. Similar meetings had been held in other districts without adverse results but in these clergy judiciously moderated and controlled excitement. Insanity engendered by extreme religious enthusiasm has probably existed throughout history, as an account is given by MacDonald (38) relating to the seventeenth and eighteenth centuries.

In Ulster revival meetings of 1859, numerous unusual behaviours occurred. People would cry out as if in agony of pain and some suffered temporary loss of speech, hearing or sight. One commentator saw the behaviour as that of a lower stage of social evolution with loss of normal self control (39). Others thought the behaviour was hysterical and in some instances mass hysteria, a diagnosis which not all medical men accepted.

There were cases of lunacy with religion reported as the precipitating cause, although obtaining definite numbers relating to the revival movement presented difficulty. The Lancet saw the movement as an exercise in religious fanaticism in which "the howls of the organisers" induced "a diseased condition of mind and body". Some disagreed with this view and thought the movement and the behaviour represented "an outpouring of the Holy Spirit".

It was generally concluded that the Ulster revival movement led to a few cases of insanity but standards of behaviour and morality showed some improvement.

Laycock wrote one of his review essays (40) following a work by K.W. Ideler On Religious Insanity, illustrated by case histories and started by stating there was an important difference between natural religion and revealed religion, whose aim was to modify the false beliefs of natural religion. "Fanaticism, folly, knavery and insanity are traceable to the Professors of every form of religious belief." Laycock said that Professor Ideler, Professor of Medicine and Clinical Psychiatry at the University of Berlin, devoted twenty-six pages to the nature of religious insanity which presented "all the peculiarities of German modes of thought and therefore has a transcendental and unpractical character which renders German theories distasteful to the more practical

English mind." Ideler's theories were not discussed by Laycock but case histories were given in some detail of which the following is a precis of the first. The others are similar.

The subject, a male, suffered from scrofula and ophthalmic disease in infancy, his father was a drunkard who abused his children and constantly quarrelled with the epileptic mother. The patient seldom went to school, had little secular knowledge, but religious instruction made a deep impression. He became shy and withdrawn suffering from headaches, palpitations, vertigo and flashing before the eyes. At eighteen years of age he was apprenticed to a carpenter but was unable to walk on rafters and had to crawl on his hands and knees. His first master died and then the second, to whom he was transferred; these deaths made a deep impression on the patient who felt he might die in an unprepared state at any time. When twenty- two years of age he went to Berlin where he experienced various somatic sensations but indulged in "illicit pleasures" which caused bitter remorse. At times since childhood he had experienced hallucinations but these caused little social disability and he continued in Berlin tolerably well for a period. He tried to convert his family, was to an extent successful with his brother, but spent sleepless nights thinking about his sister, whom he considered to be an undutiful wife. His sister so reluctantly gave him a small sum of money to send to their father that the thought suddenly occurred to him that she was the devil. He then thought it his religious duty to fast, conceived the idea that Berlin was to be destroyed by fire and went about to the houses of his friends and to hospitals blessing them. He was admitted to the Charity where he had to be tube fed, as he was so weak and emaciated; he was constantly at prayer, sleepless and bothered with hallucinations. Following a visit by his family, his father took him home against medical advice, but he was soon readmitted, silent, inactive and near to death. Tube feeding was required for some days and a cold douche applied to the head; he then began to eat and respond to his surroundings. After eight months he went home in a tolerable state of health.

Laycock commented the patient had an inherited cerebral weakness from childhood and he was therefore unable to stand emotional states and depressing

circumstances. In Laycock's experience, he had never seen a true case of religious insanity; that which could be traced to the teaching of Christ "peace and goodwill towards men".

A perceptive paragraph is at the end of the paper in which Laycock said:

There are many in society who are on the brink of insanity in whom violent emotion may cause a profound derangement of mind.

In this state they may experience delusions associated with religion without religion being the exciting cause.

He considered the violent passion as the cause of a pathological state within the encephalon.

Multiple Personality

In a paper read to the Royal Society of Edinburgh Laycock postulated on the neurophysiological basis of multiple personality disorder (41). After an initial philosophical discussion on psychology in relation to physics, philosophy and physiology he went on to the problem of the nature of belief and self identity. To illustrate his paper a portrait of a carpenter named George Elliott was shown with a legend by the artist describing himself as three persons: 1) George Elliott, his true personality: 2) George the Fifth, son of George the Fourth, and 3) The Emperor of the World - it was true the man was a lunatic but Laycock speculated along the following lines. The two halves of the brain functioned together to give a unity of consciousness, when they acted disjointedly there was double consciousness as there was double vision when eye action was disjointed. The third abnormality of personality belief resulted from both halves of the brain acting together but each half itself being disordered.

The condition was likened to a fixed dream. Laycock recalled the philosopher Thomas Reid related how when he slept with a blister on his head, he believed he was

being scalped by Indians but when he awoke memory and external perceptions restored him to normal.

Alcoholism

Alcoholism has been a problem for centuries although the term is a modern one.

Bynum has written

Although alcoholic beverages have been known since antiquity the concept of chronic alcoholism as a disease instead of merely a vice or a cause of other diseases, developed only within modern times. Psychiatrists in the 19th century were forced to consider the effects of alcohol simply because of the staggering number of alcoholics in their institutions.(42)

Many wrote on alcoholism in the 19th century and especially influential were the writings of Thomas Trotter in England and Benjamin Rush in America. Drunkenness is said to have reached a peak in the first part of the eighteenth century when consumption of spirits rose from about 500,000 gallon in 1684 to seven million gallons in 1751. Much of the poverty and criminality of the time was blamed on this and restrictive legislation reduced the consumption of spirits to under two million gallons by 1758.(43) The Industrial Revolution induced a resurgence of excessive drinking, especially in the cities. Trevelyan commented "When Queen Victoria died drinking was still a great evil from the top to the bottom of society, more widely prevalent than in our day but decidedly less than when she came to the throne." (44).

Laycock reviewed six books on alcoholism: (45)

1. Chronic alcoholism or the chronic alcohol disease: Magnus Huss, Professor of Clinical Medicine, Stockholm.
2. Lecture on the Influence of Strong Drinks on the Human

Body. J.L.C.Schroeder Van der Kolk.

3. The Physiological Effects of Alcoholic Drinks from The British and Foreign Medical Review with Documents and Records of the Massachusetts Temperance Society.
4. On the Use and Abuse of Alcoholic Liquors and Disease:
W.B.Carpenter.
5. Temperance and Total Abstinence: The Use and Abuse of Alcoholic Liquors in Health and Disease.
Spencer Thompson, M.D.
6. Report of the Committee appointed to enquire into the expediency of diminishing the present quantity of spirits served out daily to the seamen of the Royal Navy.
Parliamentary paper.

According to Professor Huss, by chronic alcoholism, he meant a neurological condition starting with muscular weakness, tremor and parathesia and the patient eventually experiencing paraplegia and convulsions. Laycock said this added nothing to medical knowledge, but Huss was right to draw attention to the total clinical picture. An instructive account of alcoholism in Sweden was given by Huss; he contended much of the medical condition was not due to the alcohol itself but to additional toxic substances in the alcohol. In the last three years 1846-9 there had been a great increase in alcohol related disease, which was probably not caused by increased consumption. A common drink of the lower classes, corn brandy prepared by distilling an extract from potatoes, may have contained an extra toxin from diseased potatoes. Huss wrote:

Long before the potato disease appeared, it was known that when brandy was distilled from damaged grain, or from decayed potatoes, a certain principle was produced, volatile, irritating, and giving forth a suffocating odour, resembling according to Berzelius, the smell of cyanogen gas in alcohol.

Several toxic substances from weeds often contaminated barley and rye. Fungi constituted another source of toxins in alcoholic distillates and were responsible for the effects of drinks known as "Old Tom" and "Cream of the Valley". Laycock regretted Huss did not say more about the blood in chronic alcoholism. Temperance Societies existed in Sweden but Huss considered these ineffective because they were too vehement against all alcoholic drinking.

Van der Kolk's work dealt chiefly with consumption of spirits which did not aid digestion, but had an injurious effect on the stomach mucosa. After absorption oxygenation processes were impeded and this undermined powers of the body and intellect. Alcoholism caused increased pauperism in Holland.

The third work told of a Temperance Society founded in Massachusetts in 1811 with Dr J.C. Warren as President. After twenty years and in spite of some success in New England, the Society considered total abstinence was the most effective measure of reducing alcoholism, but did not make this a condition of membership of the Society.

The volumes by Carpenter and Thompson had similar titles and were submitted for a prize of 100 guineas offered by a Mr Eaton; Carpenter won the prize. Both dealt primarily with the sociological problems of alcoholism about which Laycock said all would agree; the problem was what to do about it. Thompson regarded only total abstinence as a means of repressing excess and promoting temperance. Carpenter went further and dwelt on the injury likely to arise in a majority of cases from the habitual use of alcohol in moderate quantities and in weaker drinks. Laycock considered Carpenter overstretched this part of his essay, as he gave no evidence of the harmful effects of the occasional use of alcoholic drink for social purposes. Carpenter wrote "if all the world could be really temperate, there would be no need of total abstinence societies" for which statement Laycock said he had been branded a traitor to the cause by some.

For those who take alcoholic drinks to secure relief from painful feelings or boredom, the object of treatment should be diverting the mind to a better end. Those

who alternated periods of abstinence with periods of alcoholic excess had, according to Laycock, a morbid condition of the brain, oinomania, on which he wrote a paper.

The final part of the review dealt with the distribution of spirits and discipline in the Navy; letters from several naval men giving their experience were quoted.

Using the editorial we Laycock wrote

we make no profession of ascetism; we do not fast often or mortify the flesh in any way....we must therefore plead guilty the taking of wine when in our own cases it simply conduces to social enjoyment whilst even, perhaps not absolutely or altogether harmless.

In 1855 Laycock produced a paper on "Oinomania or the mental pathology of Intemperance" (46). By the word oinomania he did not mean drunkenness but a cerebral disorder, an irresistible yearning for alcohol which existed to a frightening extent in all classes of society. After quoting various contemporary works on the subject Laycock said intemperance existed in two main forms, the habitual sot, the man who was always drunk and may be so in the mornings: this person was suffering from continuous drunkenness; another form of alcoholic insanity was intermittent drunkenness where a short period of drunkenness was followed by abstinence until the next bout occurred, a condition of periodic dipsomania now a recognised form of alcoholism. From this paper it is evident that some forms of alcoholism were recognised primarily a disease some time before this was generally accepted by the medical profession although certain physical aspects such as tolerance and withdrawal symptoms were realised in the eighteenth century (47).

Those affected by alcoholism were often the children of alcoholics or those with weakened cerebral organisation due to vicious habits or undue mental labour. Not infrequently there was a family history of hysteria, suicide or weakness of intelligence. The two stages resulting from alcoholic intake were recorded,

With small amounts

the intellect is clearer, the imagination more vivid, the

memory more distinct, the thoughts more definite, in short all faculties are exalted. As to the emotions, joy, exhilaration and good fellowship are the principal results: as to appetite an increased development. If the stimulant is taken in a larger quantities..... the individual perhaps exhibits more clearly the natural infirmities of his character. The irritable and ill tempered become quarrelsome, the good natured and foolish are officiously urgent in offers of kindness, laugh wildly and are tickled by trifles and the melancholic become maudling sentimental.

Laycock indicated that after any period of excitement or activity comes repose. To the alcoholic this was a problem, and tempted him to increase his drinking "firstly to dispel the 'blues' from a previous drinking bout and secondly to give pleasurable excitement." Alcohol was recognised as affecting people in different ways; in some especially affecting the motor systems so that their addiction to the glass was not noted until they begin to walk. Case histories were produced showing that habitual drunkenness was associated with violent crimes of all kinds, with prostitution, licentious indulgence and degradation. Domestic virtue and happiness were destroyed.

Medically alcohol acted like opium eating, the constantly recurring action of a nervine stimulus led to the formation of a habit which was different from the natural appetite in that it was pathological. Laycock did not enlarge on the neurological difference but went on to describe the vast amounts of alcohol and opium which can be tolerated by addicts.

Delirium tremens was the drunkard's delirium, an acute paroxysm of mania, running its course quickly and intensely. In this it differs from oinomania and other forms of insanity which are chronic. Various reports were quoted both from the U.K. and abroad, giving the proportion of those in various institutions whose condition was due to alcoholism. Laycock estimated that overall twenty-five per cent of mental illness

was due to habitual drunkenness. In addition to the acute delirium there was a more chronic form, characterised by a destructive and violent mania with which homicide may be associated; and there was melancholia which may lead to self destruction. In fact two forms of suicide are recognised, firstly the reasoning drunkard who was filled with remorse for his behaviour, and secondly the drunkard whose suicide was a blind impulsive act often carried out whilst the subject was suffering from alcoholic intoxication.

Laycock did not favour the routine use of opium or other drugs in delirium tremens and said that in his last twenty eight cases opium or stimulants had not been used and all recovered. Examining the Royal Infirmary cases from 1839 to 1850 death from delirium tremens had increased from 10 per cent to over 20 per cent. This was due in Laycock's opinion, to the plan of using alcoholic drugs together with opium. (48). The situation was reported to be worse in the Glasgow Infirmary where the mortality was over 37 per cent.

The treatment of oinomania depended on the patient and the length of history. The object was to restore to the patient the power of self control by modifying the cerebrum in which abnormal impulses and desires acted, and the chief means of doing this was to withdraw the alcohol which was taken in excess. This withdrawal however presented great difficulties "for all experience has shown that if he [the alcoholic] has freedom of action, no motives are sufficient to restrain him from their use".

The idea of institutions for inebriety was suggested in 1834 by a Parliamentary Committee and Laycock noted that it was fundamental for such institutions to exercise the same control and authority over the subject as is exercised in asylums. Private institutions for alcoholism existed, but no special State provision was made. Jonathan Hutchinson was quoted as saying:

I have seen only one case cured and that after a seclusion of two years duration. In general it is not cured, and no sooner is the patient liberated than he manifests all the symptoms of the disease. Paradoxical though the statement

may appear to be, such individuals are sane only when confined to an asylum.

Soon after his appointment to Edinburgh Laycock gave two lectures on The Social and Political Relations of Drunkenness (49), at the invitation of the Edinburgh Total Abstinence Society. The first lecture dealt with the man's social ills and undesirable associations that went with drunkenness. The second lecture described the rise of temperance movements in America, their spread to the United Kingdom and about 1832 the more extreme members formed themselves into a total abstinence society; a move which had both bad and good results. The bad was that moderate men fell away from the cause; the good result was the effect of alcohol on the body in health and disease had been studied.

Temperance was a matter of personal hygiene; although Laycock was not against some restricted legislation, he considered the proposed legislation could never be carried to effective execution. Total prohibition might well be impossible to implement and a substitution of other pledges adopted by some total abstinence societies was considered preferable, but for this to be successful meant a creation of new desires by education. Here the clergy ought to play a part and to be concerned with man's body as well as his spirit. Laycock asked "how is it that so many spend the day (Sunday) in dissipation and drunkenness? Is there nothing to occupy their minds between the whisky bottle and the church?" Sunday could be an occasion for the diffusion of useful knowledge.

For Laycock the key to the problem lay in improving the education of the poorer classes and in persuasion. He said "a good schoolmaster is surely worth three policemen." Although apologising at the end if he had hurt the feelings of any, there was a minor furore over the lecture which was published in London and Dublin as well as Edinburgh. Carpenter who believed in the power of the will placed greater stress on self control by the individual; although differences between Carpenter and Laycock on education and self control existed, they were more a question of degree.

Statistics and Insanity

Having at one time been secretary of the statistical section of the British Association for the Advancement of Science, it was natural Laycock would take an interest in statistics and psychiatry. He never made any statistical studies himself in the way he did when studying the state of health in the city of York. He did however review a work by John Thurnam on the statistics of insanity which included figures from the Retreat, York for the years 1796-1840 (50). When patients were first admitted to the Retreat the mortality was fairly low, 5.7%; it then gradually fell over 25 years to 3.7% and stabilised after 35 years at 3.7%. Initially many chronic cases were admitted so that cures were few but later patients were admitted at an earlier stage of their illness and prognosis was better. Relapse rates were also given for the Retreat of 244 patients, 53.6% recovered from the first attack but only one third of these were 'permanently' well and a mere 20 sane at the time of death.

In comparison with an asylum serving the poor of a populous industrial zone with the Retreat, the asylum, as might be expected showed higher mortality and poorer recovery rates. There was some discussion as to how the proportion of recoveries should be calculated, on the numbers admitted, or on the number discharged. Laycock wrote at the end:

Those only who, like ourselves have been somewhat extensively engaged in statistical researches, will be able to fully appreciate the amount of labour and care, which to ensure the accuracy throughout, characterises Dr Thurnam's work.

Nevertheless he regretted that the work had not been more simple and lucid in arrangement and condensed into a smaller space to make it more attractive.

The Unconscious

In the eighteenth and early nineteenth centuries, there was intense philosophic interest in the thought processes and with this the revival of the idea of the unconscious, an account of which is given by Altschule (51).

Hunter and MacAlpine (52) consider one of Laycock's great accomplishments was his contribution to unconscious thought and its place in mental illness; they write:

As so often happens study of its history shows that the unconscious had been in many peoples minds for a very long time, but only when it was given a name did it achieve independent status as a subject in its own right, a process which the publicity of the dispute between Laycock and Carpenter furthered considerably.

The giving of a name to a phenomenon and associated concepts in scientific thought is often a matter of complex interplay (53). Unzer, to whom Laycock often referred, cited a case in whom behaviour was independent of current sensations and not in keeping with the sensorialist's concepts of thought. (54).

A certain person always faints during the operation of venesection; sometime after he meets the surgeon in the street and becomes faint: the faintness was the sentient action of the foreseeing of the blood letting and only incidental to external sensation we sigh at the sight of a person who is like another with respect to whom we have had sorrowful sensations. This sighing is the sentient action of the imagination and only indirectly of the external sensation.

Others described similar cases and Laycock described one in relation to hydrophobia in his paper "On Reflex Function of the Brain". It was Laycock closely

followed by Carpenter who brought together association psychology with reflexology involving the brain. This process was applied by Laycock especially to mental illness.

Reflexes of the brain were for Laycock both the mechanism of consciousness and of unconscious thought and at times it seemed that he considered reflexes could alter in magnitude and in kind. The ego correlated both biological and psychological laws.

You are aware that the fundamental or primary element of consciousness is the feeling of being one, or an individual - the ego of the metaphysician. It is this one, this I, this individual that is the subject of all the various changes of consciousness.

This feeling of being one was all due to the elements and organs of the body working together. "This law of unison of many parts into a harmonious whole is, in fact, not only the law of life, but of all creation."(55)

Laycock's views on the unconscious were in many respects not acceptable to Bucknill who in his critical review of "Further Researches on the Functions of the Brain" (56) gave, as he saw it, points of weakness in Laycock's paper. An important issue was sensations, Bucknill interpreting Laycock as holding that conscious sensation was only a coincidental phenomenon not required for acts, or in other words sensory cerebral action may take place unconsciously as do reflexes in the spinal cord. But the term sensation was held to imply not only a nervous impression but the perception of this. It was evident that at that time a distinction between activity in a sensory nerve and perception was not clearly made.

For Bucknill the unconscious depended merely on "the fact that we often find our minds in the possession of the results of intellectual processes while of the processes themselves we have no recollection." This could be interpreted in two ways, the cerebrum may have been syllogizing in secret, a man could not only feel without knowing it but think without knowing it. The second explanation was that the processes

of thought were forgotten and only the results remembered. This latter explanation was the one Bucknill preferred.

At some length Bucknill criticised Laycock's "unconsciously acting principle of intelligence operating upon or through matter" in various modes, and said to be "irrespective of all theory"; Bucknill saw it as virtually all theory. He interpreted Laycock as saying on the one side we have the unconscious principle producing changes in the vesicular neurine, the results of which are presented to consciousness, and on the other mental faculties acting upon or through the vesicular neurine to obtain selfconsciousness.

Bucknill ends by expressing views with which Carpenter would have agreed when he wrote

the doctrine of the intelligent self development of matter, although at the present day acquiring new strength and popularity among the speculative Germans will scarcely find many converts in this country in which there is a strong and general faith in the personality of Him whose will is made known in what we call the laws of nature.

In the years following many were to discuss and develop the concept of the unconscious which was to play such an important role in twentieth century psychiatry. Malfunction of the brain as a cause of insanity and abnormal behaviour was likewise to be extended but until the twentieth century not very successfully.

Thomas Laycock was not content to leave reflexes of the brain as a single theoretical neurological contribution, but a concept he applied to psychology and insanity. From a review of his writings on the latter subject it is evident that sympathies, alcoholism, consciousness and social psychiatry were all fitted in his somaticist thinking. Although grossly hampered by lack of basic knowledge, he was indeed a neuropsychiatrist.

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CHAPTER 7

PSYCHOLOGY, PHILOSOPHY, RELIGION, and ETHICS

Psychology

Luria (1) quoted Ebbinghaus, a late nineteenth century German psychologist as saying psychology "is a subject with a short history but a long past." Thompson (2) described the history of psychology as partly within philosophy where the history had been long and partly within physiology where the history had been short. The word psychology was first introduced into the English language by Pordage (3) who when translating Thomas Willis' De Anima Brutorum, instead of using his usual phrase 'Doctrine of the soul' used the word psychology. This was slow to gain acceptance and psychology did not enter popular usage until the nineteenth century.

Having pioneered the concept of brain reflexes and their clinical applications to hysteria and mental illness, Laycock was borne along not only by his own interests and inclinations, but by the medical profession's growing involvement with these topics. As the Asylum Acts required doctors to work in the newly established institutions, these men who were working with the mentally disturbed inevitably thought about psychology and brain pathology. This increasing interest resulted in the first British journal devoted to the subject, founded by Dr Forbes Winslow in 1848 and called A Journal of Psychological Medicine and Mental Pathology.

In one of his papers Laycock asked the question "in what respects does medical psychology differ from psychology proper?" (4). Three differences were given, firstly medical psychology was a science of the mind and body in man and was therefore a life science. Secondly the psychologists (by this he meant the psychologically orientated

philosophers of his day) did not base their subject on observation but on thought (introspection) and therefore neglected of the mind-body problem. At the time the experimental work of Fechner and Wundt and psychology laboratories were not established. Thirdly medical psychology, like all true science, is sceptical but psychology included belief making it more closely connected with faith. Laycock went at length to contrast the speculative philosopher with the medical psychologist and proceeded to give some fundamental principles of mental science. That the "soul of man" (whatever that may mean), could act independently of the body was of cardinal importance to the metaphysician. For Laycock

no feeling of pleasure or of pain, no emotion, sentiment, thought or volition, no state of mind whatever was experienced by man without a corresponding change of some kind somewhere in that portion of the body contained within the skull.

Mental functions had to be thoroughly somaticised to link medical psychology with neurophysiology; he unfortunately had no idea how such a link operated.

Philosophy

Philosophy has been variously defined. One eminent modern philosopher has written "Philosophy as I shall understand the word is something between theology and science" (5). Such a definition is well suited to the development of physiological psychology in the nineteenth century, and especially to Laycock whose writings on psychology, philosophy and ethics often overlapped.

In order to understand Thomas Laycock's writings and references to philosophy, theology and physiology, it is necessary very briefly to examine the history of the philosophical and intellectual climate into which he introduced the concept of reflex function of the brain and its consequences. It is difficult at times to separate psychology

from philosophy and the philosophy of religion from theology and there are several interweaving themes.

From the time of John Locke in the seventeenth century many thought that knowledge was built up from the simple sensory impressions which were moulded together. These impressions were of two qualities, primary ones which resided in the object itself such as solidity, motion and number, and secondary impressions which depended on the observer. Without the observer's eye there could be no colour and without his ear there could be no sound. (6).

David Hume (1711-76) had indicated that rationality in the way Locke and his followers indicated was unsatisfactory. He rejected their arguments on causation; for him cause and effects resulted from custom. Hume has come to be regarded as the archsceptic in philosophy.(7)

A key person in physiological psychology, was the physician- theologian David Hartley (1705-57) who in 1749 published works stressing the importance of associations in thoughts and considered the possibility of deducing intellectual pleasures and pain from the association principle (8). He also wrote on a theory of nervous action based on vibrations, similar to the propagation of sound and derived from Newton. Objects excited vibrations which were transmitted to the medullary substance of nerves and from there to the brain where sensations arose. In a similar manner impulses of vibrations proceeded outwards to the muscles via nerves resulting in muscular action (9). This integration of physiological processes into philosophy was to prove of paramount importance. Hartley's ideas were supported by Joseph Priestley who saw physiology as a link between men's minds, ideas and sensations and material objects.(10)

Thomas Reid (1710-96), a Scottish philosopher, stressed the activity of the mind itself in perception and judgement but Priestley considered he unduly separated mind and physiology instead of viewing them as one. Other members of the Scottish school who argued for some activity of the mind itself in mental activities were Dugald Stewart (1753-1828) and Thomas Brown (1778-1820). Stewart, like Reid, reacted to the sceptical writings of David Hume and, on account of ill health, shared his Chair of

Moral Philosophy at Edinburgh with Thomas Brown from 1810 to 1820. Brown attempted to compromise between the mechanistic associations of Hartley on the one hand and Thomas Reid on the other, who saw the human mind in more metaphysical terms and functioning as a unity with the 'soul'. The concept of association was replaced by Brown with one of suggestion and all connections between differing elements of consciousness reduced to a principle of co-existence. (11). By stressing mind in the abstract yet recognising some physiological basis for thought and behaviour these philosophers can be considered advocates of psycho-physical parallelism.

A key figure in the break with sensorialists' theories of knowledge was Immanuel Kant (1724-1804) Professor of Philosophy at Königsberg. According to Kant in his classic work The Critique of Pure Reason knowledge or perceptions arose in part from sensory impressions and past experience and in part from a priori knowledge which was instinctive. The outer world of matter caused sensation, and organised and supported concepts but sensory impressions had to be interpreted and understood by the mind. The things in themselves which caused impressions were unknowable.

Kant's insistence on a dynamically active mind influenced two important schools of thought, one German and the other Scottish. The German successor to Kant was J.G.Fichte (1762-1814) who was acquainted with Kant at Königsberg and who later became Professor of Philosophy at Jena. Fichte abandoned 'things in themselves' and concentrated on the subjective self, postulating an Ego and non Ego, the latter only existing because the Ego postulated it! In addition to his philosophy Fichte is said to have been important politically in founding German Nationalism. (12).

The successor to Fichte at Jena was F.W.J. Schelling who was a more amiable character but as a philosopher very speculative. In striving to unite nature and spirit he was led to be the founder of the German Romantic School of Philosophy. The writings of this somewhat diverse school are known as "naturphilosophie" and difficult to understand but Clarke and Jacyna consider the adverse judgement of historians needs revision. (13)

The major credit for introducing Kantian philosophy to Scotland goes to Sir William Hamilton (1788-1856) a Professor of Logic and Metaphysics at Edinburgh, and one whom Laycock often quoted. He published an edition of the works of Thomas Reid with supplementary notes and a new edition of the works of Dugald Stewart. Smith writes of him

Hamilton led the philosophical opposition to empiricism in Britain and deserves further study. In relation to muscle sense he distinguished direct knowledge of a faculty of volition in personal effort, from phenomenal knowledge of the external world in the perception of resistance. This distinction was part of his explication of the notion of common sense intuition employed by Reid (14).

Hamilton is also remembered for maintaining the importance of subjective analysis. It was not a weakness compared with the physical sciences, but one of its strengths. (15).

Possibly the most important philosopher (according to some a psychologist) in physiological psychology was Alexander Bain (1818-1903), an agnostic, who had difficulty in obtaining an academic post but eventually became Professor of Logic at Aberdeen, his native town. Bain was an associationist but recognised innate forms of association and realised that not all mental states were the result of sensory stimulation. Bain believed that movements as well as ideas could be associated and that consciousness of movement was parallel to motor impulses. Most important of all was his realisation that an understanding of the brain and nervous system was a necessary foundation for a science of mind. It has been said

The key to understanding the relation between speculative natural philosophy and psychological theories of perception is that muscle sense experience was supposed to be a different quality from other experiences, and somehow a more fundamental source of knowledge about the physical world. (16).

Herbert Spencer (1820-1903), initially a school master and then railway engineer, later turned to journalism and philosophy. His connection with evolution and psycho-physiology started in the summer of 1851 when others with similar interests met at the house of John Chapman for Friday Soirees. Chapman had recently acquired the Westminster Review and was looking for contributors. The group included such famous names as J.S.Mill, Robert Chambers, and William Carpenter (17). The discussions involving evolution, technology, sociology and progress inspired Spencer who became a dedicated evolutionist. The social aspects of evolution had special appeal for him, and he thought that what was true for animals would also be true for man. His most important work Principles of Psychology (1857) dealt with mind in all its forms, including animal minds. He wrote many articles on similar lines which proved popular and influential because of his lucid and enthusiastic style of writing.

Laycock thought J.S.Mill occupied an intermediate position between the metaphysical philosophers and those who recognised the link between mind and brain. Many of the difficulties for mid-nineteenth century philosophy and religion arose from the new developments in natural history and anatomy. These were taught in Paris where many medical students of the time spent a period of study, and they returned bringing with them ideas of transcendental or philosophical anatomy. The term transcendental implied more than descriptive anatomy, it was the bringing of order out of a mass of detailed knowledge. Two great pioneers of this movement were Jean Lamarck and Étienne Geoffroy St.Hilaire. Lamarck conceived the idea of transformism: the similarities and differences as shown by the comparative anatomy of animals were not a static relationship but a dynamic one. Geoffroy St.Hilaire favoured a descent relationship between species and stressed the importance of environment in organic change. In spite of some differences, such as Lamarck's refusal to accept any place for catastrophes (18) there was, prior to Darwin, a considerable amount of evidence for, and discussion about, evolution. Much opposition to such doctrines was generated by the churches, man was considered a unique species and his mind and spirit, which might need his brain for operation, the means whereby the divine operated. Hence the

extension of reflexes from the spinal cord to the brain created a great upheaval in spite of the scene being set. Physiological psychology implied a mechanistic explanation of man's behaviour, his thinking and took away his special relationship with the divine. Many such as Carpenter and Bucknill endeavoured to preserve established Christian belief and to this end saw entities such as 'spirit' or 'will' as being special to man and operating over, or above, any reflex action.

A polymath theologian, sometimes quoted by Thomas Laycock, was William Whewell who attempted a philosophy of science which was consistent with natural theology. To an extent he followed Kant in that certain fundamental ideas such as space, time and cause gave rise to conceptions which played an important part in human thought. These ideas were not dependent on experience but did require experience to "unfold them". The highest levels of physical knowledge were dependent upon metaphysical ideas provided by the mind; a spiritual mind was thus ensured. The concept of a final cause made it possible for man to rise from a study of nature to God and the study of the material world afforded a natural means of thinking of the creator of the universe (19). Whewell's philosophy also allowed for a moral dimension in that when tracing the powers of the intellect man is led upward to the mighty intellect which framed the universe and the purposes of God for him, and these included social behaviour. Not all followers of natural theology agreed entirely with Whewell, a notable exception being the Scottish writer Sir David Brewster. In one respect Whewell's views coincided with those of Paley's in that he maintained there was a perfect fit between organisms and their environment. Brewster asked what was the value of Whewell's arguments if naturalists one day proved that animals could adapt themselves to a different environment? In Brewster's view limitation to a fixed niche could not be advanced as evidence of a design, the correct perspective was a flexible law of design.(20).

Thomas Laycock examines the consequences of brain reflexes, ✓

The necessity of considering philosophical questions arising from extending reflex function of the brain became apparent to Laycock who rose to the challenge . (21). He stressed the physical basis of morbid mental functions and quoted Reid in support of such a position "In perception the object produces some change in the organ [of special sense]: the organ produces some change upon the nerve; and the nerve produces some change in the brain." Laycock continued by describing the history of reflexes together with his own work and differences from Carpenter's views.

Laycock then wrote

we might rest here, and be content with stating the cause (or necessary antecedent) to be the infinitely varied and exquisitely adapted actions and movements known as reflex, automatic, unconscious and instinctive, is this definite arrangement and fixed mode of action of the vesicular neurine; but the mind at once perceives the incompleteness of the statement, for it is obvious there must be a necessary antecedent to the intelligent action of the machinery, in the intelligent construction of it,

A great problem in the nineteenth century was how did the arrangement of material elements result in life. Some theories involved an outside agent or spirit which in some way entered into the organism. Because of the great complexity of nature and the excellent adaptation^{ra} of organisms to their environment the agent must have been one that had intelligence.

According to Laycock

This quasi-intelligent agent thus works with an apparently perfect knowledge of number, geometry, mathematics and the properties of matter known to the human intellect under the term natural philosophy or physics.

Two intelligences are postulated, the general principle in nature and the intelligence of mind, although both united into one unity.

The quasirational or sentient agent which combines and regulates the movements of the limbs or other organs to these ends is seated, in nervated animals, in the masses of nerve cells (vesicular neurine) termed ganglia.

It was, claimed Laycock, Unzer who first systematically showed the identity of mere reflex phenomena with those which are instinctive and emotional and explained the share which the states of consciousness termed pleasure and pain have in all these excited acts. He also of all neurologists has most successfully made these doctrines elucidate the highest mental phenomena.

Because of difficulty in relating all aspects of consciousness to reflex action Laycock resorts to some extended footnotes.

In thus using the term unconscious and unconsciously acting I mean solely to indicate the mental states of the organism itself... Consciousness is in fact but one form of manifestation of the principle of intelligence. I know of no one word which will exactly designate the latter.

A further function for the unconscious principle of intelligence was related to the sensation of pleasure or discomfort.

I have stated that in conscious animals the operations of the unconscious principle of intelligence are associated with a feeling of pleasure or wellbeing if normal, with a feeling of discomfort or suffering if abnormal. But I wish to include among conscious animals only man and the vertebrata.

As recorded in Chapter 4 Laycock and Carpenter differed over the place of sensation in reflex function of the brain, Laycock holding this did not constitute an entity in its own right but the result of a state of organisation or activity of the neural tissue. In support of his view Laycock quoted Thomas Brown.

Sensation is not the object of consciousness different from itself, but it is the consciousness of the moment; as a particular hope, or fear or grief or simple remembrance may be the consciousness of the next moment and when we speak of consciousness we mean nothing more than the evidence implied in the mere existence of our sensations, thoughts, desires which it is utterly impossible for us to believe to be and not to be; or in other words, impossible for us to feel and not to feel, at the same moment. (22).

In response to given stimuli, the basic action in man as well as animals was instinctive, an evolutionary basis of behaviour. "The fundamental action of the human mind and its organisation is therefore instinctive" wrote Laycock. A quotation from Sir William Hamilton gave further weight to this opinion

An instinct is an agent which performs blindly and ignorantly a work of intelligence. The terms instinctive belief - judgement - cognition which as a result of no anterior consciousness is like the products of animal instincts; the intelligent effect of (so far as we are concerned) an unknowing cause (23)

For Laycock all behaviour, psychology and psychiatry were determined physiologically, based on reflex action of the nervous system. There was nevertheless flexibility in that behaviour could, to an extent, be modified by learning, examples of this were given in his advice to medical students and on the problem of alcoholism.

All cerebral physiology and pathology thus described was consistent with the law of design. Laycock himself wrote

The development, conservation and reproduction of all organisms are regulated by an unerring law of design - a law as generally applicable to living matter as the law of gravity to universal matter. This law must be our guide in ascertaining the relations

of the reflex, instinctive, emotional and voluntary movements

Laycock's ideas on altered states of consciousness and abnormal brain function are discussed in relation to psychiatric conditions in Chapter 5.

The observations of Konrad Lorenz on innate releasing mechanisms would have rejoiced Laycock's heart had he lived to read them. Having dealt with consciousness, the will, the senses, and the self, the great question of causation remained to be considered. This Laycock thought arose in the mind because the "unconscious intelligent agent" had laid down predetermined neural arrangements of organisation, so that they always responded to the same stimuli, and thus the idea was produced of a state of consciousness that they would respond in the same way in the future. Causation like other mental phenomena was given a neurophysiological basis by Laycock and to stress that he is not alone in this view he added "The intimate connection between mind and organisation both as a fact of experience and in the relation of cause and effect is recognised by several as eminent as Mr Spencer, Mr Morell (24) and Mr Bain."

At the end of his paper on "Further Researches", Laycock said he thought aesthetic taste and judgements could be rationally deduced. In music vibrations were important multiples of fundamental numbers, the well known example of a note rising by an octave when the frequency of a plucked string doubled was given. A well known Edinburgh artist and writer, D.R.Hay, was quoted as stating that the eye was equally influenced by proportion as was the ear, and stated

That a figure is pleasing to the eye in the same degree as its
fundamental angles bear to each other the same proportion that the
vibrations bear to one another in the common chord of music.

This was further extended to rectilinear and curvilinear figures, and finally to construct a figure with perfect human proportions. A full page wood cut was given of a Scottish female model with all necessary lines and angles drawn in. The results were similar in two classical models of Venus.

The "Further Researches" Paper was severely criticised by J.C.Bucknill (25) especially in relation to Laycock's description of the unconsciously acting principle of

intelligence, which operated on, or through, matter in ways said to be "irrespective of all theory". This Bucknill very much doubted. On one side the unconscious principle produced changes in the vesicular neurine, which were presented to consciousness as thought, while on the other hand mental facilities acted on or through the vesicular neurine and thus attained self consciousness. Bucknill concluded

The doctrine of the intelligent self development of matter, although at the present day acquiring new strength and popularity among the speculative Germans will scarcely find many converts in this country in which there is a strong general faith in the personality of Him whose will is made known in what we call the laws of nature.

Bucknill also thought little of Hay's beautiful female figure. The wide iliac region would result in obliquity of the femora and the breasts might be deformities if they were not functional. She was "decidedly that of which Byron declared his abhorrence a 'dumpy woman'."

For his own part Laycock considered that in spite of his close connections with Göttingen and Germany he did not embrace the "romantic philosophy" with its implications for psychology and theology. He wrote "The philosophical school of physiological psychology is variously constituted but may be divided into two divisions, the German and the British. The German is highly speculative and is perhaps best represented by Oken" (26). The reason for Laycock selecting Lorenz Oken as a favourable exponent of naturphilosophie is uncertain. Oken, well known in his time, did write in a very speculative way, he thought life was possible when magnetism, chemism and galvanism existed together, but only galvanism was "total and capable of becoming under proper conditions the basic process of life". Hall (27) sees his writing as contributing to the search for a "possible single substance presumed by some to be the common vector of life". On the other hand Laycock may have had in mind work done by Oken on the development of the vertebrate skull from certain vertebrae. Laycock was probably justified in considering himself not part of the German romantic school as his

theories were based on firmer chemical, physical and biological science. Gower (28) writes:

That is to say, whereas in transcendental philosophy the origin and explanation of design, order and coherence of the physical world is to be sort in terms of the a priori principles supplied by the intelligent self, Schelling claims that it must be possible to conceive nature itself as the source of this design order and coherence.

The end of the eighteenth century and the beginning of the nineteenth saw a great interplay between philosophy and biology. This has recently been reexamined and appraised. Rehbock comments

The great plan upon which nature had been built, the highest laws governing the appearance, the form, the demise of organic beings might be discovered a priori. The idealist "philosophical" naturalists took their inspiration not from English philosophers like Francis Bacon or John Herschel, but from Plato, Kant, Goethe, the German Naturphilosophen and the British from Whewell, Samuel Taylor Coleridge and the earlier Cambridge platonists (29). The same author considered Richard Owen influenced by Oken. that [Owen] was deeply influenced by the philosophy of Oken bringing it apparently in his own mind into harmony with that of the English platonists, especially that of Cudworth, is a conclusion which can hardly be avoided (30).

Another author on the period considered that the pursuit of teleological and functional explanations aided the development of biological science and especially embryology. Further teleology had religious and non-religious aspects (31). Laycock was a thoroughly committed teleologist who saw the intelligent principle behind all; a first cause in the law of design. A paper by Jacyna (32) described two groups who viewed life differently in the period 1790-1830. The transcendentalists thought all life

emanated from Deity, who ordered all natural events, earthly and cosmologically. Order and power in this life had to be imposed from above by a superior being; this included the moral order which was God given. The other main group was the immanentists who held mind with all its faculties resulted from material order, although some thought that inert matter had to be acted upon by something external to itself. The immanentists also considered a moral order or natural ethic evolved with natural laws; these were shared with and evolved from lower species in the animal kingdom. Although Laycock was an immanentist he accepted that the moral order was given from above, he firmly believed in the "Great Chain of Being" a doctrine which saw a continuity from the lowest forms of life to Deity, although the doctrine changed at various periods. (33).

Laycock wrote in "Reflex Function of the Brain",

The law of gradation of development vigorously pushed to its legitimate conclusion points out an infinite gradation above and superior to man. That we cannot see such beings nor demonstrate their existence is a necessary result of our position in the scale, and no proof whatever of their non existence. The worm knows nothing of man, his works or his action: nothing of the sun or the stars or of the being swarming around it, and so with reference to the spiritual world, the world around and above us - our organs may be and doubtless are, as imperfect as those of the worm with reference to the world around and above it.

Religion and Thomas Laycock

In the consideration of Laycock's religious view it is necessary to recognise in addition to his Methodist upbringing great influences in his early life in London. The first was Robert Grant, who has been discussed in Chapter 2; the second was a Mr

Hardy who gave Laycock a recommendation to University College. An entry in Laycock's Journal for November 19th 1833 stated

Last evening I was at Mr Hardy's, Walworth, and took tea with him.....we had a long discussion on the materiality of what is called the soul, the resurrection of man, a future state, the existence of the devil, the plenary inspiration of the scriptures _ I don't know what. In short he was a Unitarian and he acknowledged it. We agreed on some points respecting the resurrection and the fact that the mind is the result of organisation and he seems highly delighted. He has lent me Carmichael's Essay on the above subjects. (34).

By 9th February 1834 Laycock had read Carmichael's Essay on such Physical Considerations as are Connected with Man's Ultimate Destination: The Essential Constitution of Superior Beings and Presumptive Unity of Nature and commented

A well written book and embracing arguments and opinions which occurred to my mind before I read any work whatever on the subject. The texts....(Biblical quotations) corroborate the idea that man's soul has not an independent existence (34).

Alexander Carmichael was a seventeenth century Scottish divine who, in 1672, was brought to Edinburgh, appeared before the Council and charged with keeping conventicles (unauthorised assemblies for worship). Carmichael pleaded guilty and was exiled to London where his efforts were deemed to have been more fruitful. He died about 1676 or 1677 (36). Important sections for Laycock were

That our hopes for a future state cannot rest with any certainty upon the existence of a soul, as maintained by the ancient philosophers; but upon our resurrection from death as announced by Christ, and taught by the evangelists and Apostles throughout the whole of the Christian revelation.(37)

For Carmichael the doctrine of a soul was Greek and pagan and he concluded

The crazy and fantastic fabric of a fallacious philosophy totter to their foundations of sand - but the truths of science and the truths of religion are alike the truths of God (38).

When writing the analysis for his hysteria papers Laycock was again pondering the results of making mind a mere property of brain. On 2nd April 1837 he wrote in his Journal

the body at the resurrection will not be the same body as we take so much care of upon earth. The particles of this body at death, the oxygen, hydrogen, nitrogen etc. will enter the bodies of other animals and vegetables and may enter the bodies of some twenty individuals so that to which man do the particles belong?

How are the dead raised up and with which bodies do they come?(39)

Laycock's biblical hero St.Paul knew the answer: "the body will be changed" as he knew that which is sowed is not quickened except it die or decompose. The new body will be like Christ's glorious body: "flesh and blood cannot inherit the Kingdom of God." It would seem on the 2nd April Laycock must have spent most of the night considering these matters, for seven pages are written with extensive quotations from St.Paul and St.John. By the end he is satisfied he can unite biology and mind and remain a Christian; he concluded "Mind, soul and consciousness are not external spiritual entities, they die with man but there is a resurrection."

The problem of a future life is still being pondered in November of the same year, when Laycock devotes four pages to his Journal to the problem and in spite of Carmichael, uses the word soul. He wrote:

It must be so there is a life hereafter. For man only because he wishes it, because he feels he ought to enjoy it, because the hope and wish to enjoy are part and parcel of his present existence: his soul looks into infinite existence because it is capable of enjoying it and was

created for the very purpose Thus it is the soul raves
while in her clay tenement, she feels the spring of the eternal
within her, she knows it shall be hers but mistakes the
where and how - she gazes upon eternity - she feels certain
she shall be launched upon that shoreless unfathomable ocean -
but alas she madly hoists sail in a cockle-shell .

April 2nd was the first Sunday after Easter and Laycock considered the creed statement "I believe in the resurrection of the body" and commented some of the older divines still held that when the last trumpet sounded "particle will be united to particle, bone to bone and muscle to muscle". If this were so Laycock could not stand the ghastly sight of skin covered skeletons, the body that died full of sores and the mangled remains of those who met violent deaths.

By February 1838 Laycock had been reading extensively for his hysteria papers and said he must review the speculations of metaphysicians (40). He asked God's aid in this and claimed whatever else resulted he would have cultivated his mind and enlarged his comprehension. A year later Laycock continues to ponder religious questions and wrote "Faith must begin somewhere and reason ends where it begins:- how then can the Papist or Pagan be blamed who believes as he has been taught," but reluctantly concluded "Tis mystery all". He continued by asking why medical men are so frequently infidels; Hippocrates was said to ridicule the worship of Apollo in return for medical cures. Certain biblical events and cures were examined. The men in Matthew Ch.8, Mark 5 and Luke 8 were considered to be cases of wolf madness. The girl in Luke 9 was an epileptic and the other one in Luke 8 appeared to have catalepsy.

"If the devils of the New Testament were really no devils, but epileptics acted on by intense emotion or by the popular agitation of the day, what are we to think of the writers who could be so deceived? what credibility can we attach to their histories? and how can we believe that all Scripture was written by the inspiration of God" (41).

At this point Laycock had become disillusioned with revealed religion but in March 1839 after reading Knox's Remains he wrote of the Bible

But how many more things have a symbolic meaning in that book —
 Happy is the Papist who relies implicitly on his priest or the
 savage who offers a pig or a feather to his idol and goes
 away believing ———Must I be a Papist Episcopalian,
 Calvinistic Unitarian, Swedenborgian or a socialist or
 shutting my eyes be a Wesleyan because my father was?
 September 1841 sees Laycock still in a quandary. He recorded
 In religion I am still undecided except that I hope by the
 blessing of the God of my fathers to do good while I live (42)
 Such a view enabled him to unite his approach to the practice of medicine and its
 teaching with a personal religious faith. On moving to Edinburgh he became and
 remained a member of St. John's Episcopalian Church and is buried in the churchyard
 .

Ethics

Although medical ethics can be traced back to the Hippocratic Oath, it became especially prominent in the nineteenth century. Edwin Chadwick looked to Governmental legislation to remedy the great epidemics of infectious disease and for this reason his class activities have been referred to medico-politics. In contrast there is a class of ethics independent of the state and legislation but dependent upon the individual physician's own conscience and moral judgements (43). A further influence in the development of nineteenth century medical ethics was the frequent public disputes between medical men in the late eighteenth and early nineteenth centuries, and an influential writer in this respect was Thomas Percival, a physician trained in Edinburgh, who practised in Manchester and published a work Medical Ethics in 1803.

Laycock often wrote on moral and ethical issues which show for him the certainty that the moral order was God given. In 1846 he reviewed a book by

Maxmillian Simon of Paris (44) which noted that the moral standards of many medical men fell short of that desirable and Laycock commented

The cultivation of medicine equally at least with members of any other profession, may without usurpation to use the words of Sir Thomas Browne assume the honourable state of a Christian, and dare we assent that none disgrace the honourable state more than medical practitioners.

A lengthy quotation from Simon illustrated the essence of the moral approach they shared. Part of this quotation reads

With the man who is responsible to God alone for his decisions and actions regarding a thing so precious as human life, the thought of God should ever be present. A philosophy through which the sap of the fruitful thought does not circulate will be powerless to guide the physician at all times in the midst of the numerous quicksands he must meet with in the exercise of his profession. Medicine may be traced to God through the sympathy which the appearance of suffering awakens in us; but as a science of so high origin it only completes its work by asking from charity its love and devotion. The physician who takes the light of this dignified philosophy as the guide of his conscience may fail, but his fault will only be imputed to the imperfections of science. Understanding the dignity of human nature and the profound objects of life, he will devote himself entirely to the study of a science which can influence so decisively the individual destiny of men.

The title of Simon's work was Medical Deontology, a word adopted from Bentham and used to mean the duties of physicians to their patients and society and in return the rights society needed to give physicians; duties and rights were reciprocal.

Simon then proceeded to discuss various aspects of medical practice, and the physician's character; Laycock commented on these.

Some medical journalism was criticised, men reported cases they had never seen, asserted cures they had never performed and recorded facts which had never occurred. Laycock thought some day he would make a collection of such writings and expose them. He expressed himself in metaphorical and poetic language belonging to a different age of medical authorship. He wrote we "promise ourselves some day the pleasure of impaling a few specimens of these creatures on our critical pens and placing them with outstretched wings in our bibliographical museum".

Simon regretted more respect was not paid to the dead, especially by students in the dissecting room; Laycock hoped prosectors had changed and humanised the students. He had previously written advocating moral training for medical men which started in their early days as students. They should be taught that the principles of medical science and morality have a close and important bearing on the morals and welfare of mankind. If in asserting the dignity of their subject they were called upon to suffer persecution or neglect from the prejudiced, the ignorant or the frivolous it was their duty to endure quietly and manfully (45). An example in this respect was set by Laycock himself even if he did offend people by his outspoken opinions.

The duties and rights of medical men were described by Simon on which Laycock commented. Some of these are:-

Medical aid should be never refused to anyone deserving assistance, the rich and poor, good and bad are treated alike. Laycock agreed medical distribution must be just and is gratified that Fothergill is given as an example and that no sympathy is expressed for the rough spoken imitators of Abernethy and Dupuytren.

Discretion was always required of medical practitioners who should never gossip about their patients or reveal any secrets. For Laycock this was an area where conscience had to guide, for he would denounce a murderer but not a poacher.

Women and old men (but not children) deserved special consideration and Simon devoted a whole chapter to denouncing the "heroic" method of treatment; this was

introduced by John Brown (1735-88) and involved giving large doses of alcohol or opium. Laycock thought it should be called the murderous method of treatment.

In conclusion Laycock observed that Sir Kenelem Digby's comment on Sir Thomas Browne could be applied to Dr Maximilian Simon "His wishes and aims and what he pointeth out speak him the owner of a noble and generous heart."

Laycock reviewed two works on ethical matters by his mentor Dr Karl Marx of Göttingen. One paid tribute to an old friend and colleague Dr. John Stieglitz and after a very brief review a number of extracts from letters of Stieglitz were given. These recorded his regret at the behaviour of some physicians, that more attention was not given to incurable cases and he was shocked at the intense treatment given to some patients. John Brown's methods had been popular in Göttingen. Marx concluded by saying of Stieglitz

His name alone gave confidence to the suffering, his presence comfort and help faith and trust preceded and followed him.....so he completed a busy and useful life; to the state a faithful servant; to society an ever ready helper, to his own people and friends a sure rock of defense.(46).

A more extensive work of Marx was "A glance into the Ethical Relations of Medicine". He opened by referring to Askesius (47) an Egyptian demigod who became an emblem to the sick and their disabilities and the hope of their restoration to health. Marx said he did not intend to deal with cures but was only going to write of that which sprang from the heart and not the head.

The essential of medical ethics was an unqualified love and reverence for God and an unselfish love and honour for humanity. With these as a guiding principle in his scientific and clinical work the physician had opportunities not surpassed by any other profession. "He is the special messenger of providence to suffering mankind." Marx then went on to write letters to several departed physicians such as the author of Religio Medici.

In conclusion Laycock wrote:

We have before recommended the works of Professor Marx to the student of German language and literature. The terseness and elegance of his diction are equalled only by the charm of his sentiments. Besides he is well acquainted with our language, our literature and our institutions. His ethics, we need not say are in every way British, refined and illustrated by the operation of his own mind.

Laycock was convinced that moral and ethical standards were God given rather than man made from natural observations and experience are in his review of four books having some bearing on philosophy and moral science especially a work by J.G.Fichte (On the nature of the scholar and its manifestations) (48).

Some general remarks on knowledge and natural theology were made by Laycock who held a mind illuminated by a knowledge of the wisdom and goodness of God in creation linked with God's guidance by the Holy Spirit would lead the human race to a holier civilisation and "quench the foetid smoulderings of real scepticism, the disbelief in a moral governor of the universe and a moral and spiritual world." A quotation is then given from Fichte in support of this view.

The whole material world, with all its adaptations and ends, and in particular the life of man in this world, are by no means in themselves, and indeed and truth that which they seem to be to the uncultivated mind and natural sense of man; but there is something higher, which lies concealed behind all material appearance. This concealed foundation of all appearances may, in its greatest universality, be aptly named the divine Idea.

This could be regarded as typical of Fichte who was primarily concerned with mind rather than material objects or common events. The divine idea was accessible to any cultivated mind and these attain a higher spiritual life. This was the true scholar. The apparent scholar had only gone through a course of learned education. Various lectures by Fichte spelt out the nature and character of the true and honest scholar.

He shunned contact with the vulgar and ignoble, he was no boasting deprecator of his brethren; no vulgar quack; no base raker-up of riches; no pilferer of the merits or reputation of his comperes. He shunned everything which weakened spiritual power; idleness, drunkenness, sensuality, pride, self contemplation.

The physician could become the divine image in man. Laycock did not disagree with this but said St. Paul anticipated Fichte when he wrote "Man is the image and glory of God." On the question of morality Laycock had some reservations about Fichte's views. For Laycock morality was a "direction of character according to rule and precept" but Fichte held this was true only to a limited extent, and that whatever was manifest in the thoughts and actions of a man must first be present in his nature or mind. It was that which lay in the essential nature of a man which revealed itself in his outward life.

Laycock then moved to the question that if a medical practitioner's faith is broadly founded how should he view the various sectarian movements within the church, and he thinks Fichte's advice on this generally sound.

The true minded student will not make himself a slave to common opinion: nevertheless he will accommodate himself to established customs where they are in themselves indifferent, precisely because he honours himself. The educated youth grows up amid these customs; were he to cast them off, he must of necessity deliberately resolve to do so, and attract notice and attention to himself by his singularities and offences against decorum. How should he, whose time is occupied with weightier matters find leisure to ponder such a subject? and is the matter so important and is there no other way in which he can distinguish himself that he must take refuge in a petty peculiarity?

Laycock's comment was

With regard to Christian sects, the peculiarities are not so

important; but even some of these must be considered in their political results, and the practitioner will then perhaps feel himself called upon to assent the dignity of human nature and the priceless worth of civil and religious freedom; to fight for the truth in its purity.....Nevertheless the medical philosopher must look with a pitying eye upon religious strife and persecution so rife among men.

Professional Rules

On this subject Laycock considered: "A broad distinction should however be drawn between offences against morals and offences against etiquette or propriety". In his opinion the latter were often more offensive as their lesser importance was forgotten amidst the angry feelings excited. Offences of this kind originated from vanity and cupidity.

He reviewed a small pamphlet of the Rules and Bye-Laws of the Manchester Medico-Ethical Association published in 1848 (49).The activities of unlicensed practitioners were highly undesirable for many reasons and the squabbles between qualified men was lamentable.The problem could only be solved by legislation regulating the profession. The Lancet published an editorial commenting on Laycock's paper.

There are no passages in the article.....with which we more cordially agree than those which describe unworthy jealousies which arise between some among the different classes of the profession.(50)

Waddington thinks

This high level of competition between practitioners appears to have been associated with the fact there was a rapid increase in the number of practitioners qualifying in the

1820's and 30's.....This overcrowding in turn gave rise to a situation of cut-throat competition between rival practitioners particularly in the form of poaching which was common. (51)

There was only one foundation alike of medical ethics and medical etiquette, the law of Divine Wisdom and love. "Do unto others as ye would that men should do to you." To this Laycock adds the description of love given by St. Paul to the Christians of Corinth "Love is forbearing, obliging: love is not envious, love is not arrogant; is not proud: is not rude, or selfish, or irritable or slanderous. It has pleasure in truth and not falsehood, is content with all, confides in all, trusts to all, bears with all."

These papers on medical ethics were published in 1855 as one work entitled Religio Medicorum. Laycock did this to aid his election to the Chair of Medicine. He wished to establish he was not a materialist and was a genuine Christian. Barfoot comments:

His medical Fichteanism may not have convinced some of his professional and academic critics..... nevertheless his broadly Christian medical ethics probably offered common ground for approval among denominationally diverse Edinburgh councillors (52).

Such was the approach of Thomas Laycock to matters of morality and ethics. On etiquette his views are especially interesting considering they were written when qualified practitioners were competing with the unqualified and competition among the qualified was often intense.

The teaching and influence of Thomas Laycock in invoking the organisation of matter to explain both mind and life were to prove extraordinarily successful in the later nineteenth and twentieth centuries. That these explanations had philosophical, theological and moral implications was appreciated by Laycock; they posed matters of speculation and debate which continue today and involve matters of great social importance.

Mind and Brain.

After he had started his summer course of lectures at Edinburgh on medical psychology, Laycock published a two volume work entitled Mind and Brain 1860 (53).

In the preface he wrote

An urgent need was felt for an introductory exposition of the correlation of physiology and philosophy, whereby the reciprocal relations of mind and body - the subject matter of medical psychology - could be scientifically and practically determined... There is no discussion as to the nature of the soul, mind or spirit such as is found in psychological works generally; and thus the phenomena are examined wholly apart from those philosophical and theological speculations which are altogether foreign to science.

In a previous work (21) Laycock had given a definition of mind

The human mind is none other than the unconsciously working principle of intelligence individualised, become conscious of its own workings in the cerebrum and deriving its ideas from its own constructive or material changes in the organ of mind.

Volume I of Mind and Brain had thirteen chapters and is divided into three parts.

Part I set forth the connection between physiology and metaphysics, the ends to be attained by a practical science of mind and the abstractions arising from conflicting theories of mind.

Experience was manifest in three clearly related modes:

1. Man's conduct as an individual
2. His social conduct

3. Language which described and regulated the first two. (54)

Part II (Metaphysics) begins with a discussion of mind and matter. There was a difference in that various forms of matter could be manipulated and compared, whereas mind was a subjective experience limited to the individual experiencing it. Man compared himself with other animals and with the result of Divine intelligence as seen in creation. His own mind was likened to Deity so that he is the image of God and at the same time God was anthropomorphic (55).

Various philosophers had attempted to unite mind and body from ancient times and in [for Laycock] modern times, systems of physio-philosophy had been developed in Germany under the name of naturphilosophie.

Goethe, Oken and others developed systems of this kind in which the fundamental idea is that life and consciousness are due to a common cause and that is mind (56).

A sentence to occur later in the same section is

Oersted in Copenhagen, gave a more practical turn to the speculations of the physiophilosophers and rendered them subservient to the experimental discovery of great general laws.

This point was made over a century later by Gower (57) in a detailed study when he wrote:

His [Ritter the physicist of the Romantics] friend and colleague Oersted is known to have studied Schelling's work and is alledged to have ascribed his discovery of electro-magnetism to Schelling.

Part III of Volume I dealt with teleology and mental dynamics.

Physical forces were themselves derived from another force which ordered all things to ends and was mostly manifest in life itself of which thought and consciousness were the highest evolutions.

Mind is therefore the universal element in our cognition

of both physical and vital forces and consequently of all the known forces of creation ... mind is the first cause; the one absolute thing from which all other causes and things are derivative.(58)

Applying teleology to biology Laycock thought in one form or another 'archetypal ideas' had so influenced biology and zoology that these subjects could not have developed without it. Oken, Von Baer, Geoffroy St. Hilaire, Cuvier, Lamarck and John Hunter were among others quoted as developing 'philosophical zoology' which included embryology. Robert Grant was praised as the first teacher of philosophical biology.

Evolution was to Laycock synonymous with the law of development and this same law applied to the evolution of new molecular compounds and the organised life of society.

The law has already had an interesting a priori application to sociology given it by Mr Herbert Spencer in an inquiry into the genesis of associations of men and the development of the laws of society (59)

The second volume was also in three parts.

Part I Principles of psychology covered among other subjects the ego, desires and instincts, free will, the association of ideas and the association of ideas as sympathies.

Part II The Principles of mental physiology dealt with ideas of Prochaska, Gall and others on cerebral function:

Action of the blood on tissues and the nerves in relation to blood flow and instinctive and automatic movements.

Part III Principles of mental organology was mainly descriptive neuroanatomy with some comparative anatomy.

One commentator epitomised the work when he wrote:

It is not every day we meet with broad and free intellects that know how to make Plato and Bacon shake hands. Cudworth and

Combe kiss each other while innate ideas (which Locke is thought to have exploded) walk peaceably the highway with Christian Theology on the right hand and histology on the left. But this large and liberal faculty of appreciation Dr Laycock possesses to a very high degree and it is this which to our mind gives the great charm to this book (60).

One of the most adverse criticisms of Mind and Brain was by S.J. Bushnan, resident proprietor of Laverstock House Asylum who wrote two articles (61), firstly a review of Mind and Brain and a review of On Obscure Diseases of the Brain and Disorders of the Mind by Forbes Winslow, and secondly a paper on The Scientific Place and Principles of Medical Psychology, a title borrowed from Laycock and devoted to a discussion of Laycock's views. Bushnan admired the way in which abstruse subjects were dealt with, but thought metaphysics and physiology not suitable for amalgamation and it would be best to let each subject go its own way. He went into a detailed discussion of many issues from Mind and Brain, such as the material or non-material ego and Laycock's grand aim of establishing a teleological force, a personal yet non-material non-physical designer and therefore an infinite mind.

Laycock replied at length to some of Bushnan's points and said he was startled that his work in relation to medicine in general and psychiatry in particular was considered "in no sense practical" and he could think of no other way of establishing who was in error than a comparison of his and Bushman's principles. For Bushnan the way forward in art and science was in the opposite direction from generalisation. Laycock gave reasons for disagreeing with this and quoted generalisations in optics as leading to the telescope and microscope and the generalisation of Newton in relation to astronomy. Bushnan had written

A principal use of a course of metaphysics to a student whether his destination be to medicine, law or divinity is to enable him to understand the sense in which certain words are commonly used when his professional pursuits carry him

into disquisitions nearly boarding on the metaphysical. How would a student fare who had applied himself, however diligently to Dr Laycock's work but none other?

Here Laycock thought Bushnan was a little unreasonable; it was true that metaphysical terms led to many ambiguities which lead to a chaotic state of mental philosophy, but he had discussed these in relation to many distinguished men.

In a long discussion on teleological force and the law of design, Laycock contended he always considered man as he existed on earth. Mind in the abstract was not a personal entity, but an ordering force as universal as the force of gravity. Although his chapter on mind as a first cause may, to an extent, have been out of place when considering practical metaphysics, discussion of the nature of Deity was not the object of thought but to guide speculation.

The second main objection of Bushnan to which Laycock replied was that his generalisations were of no practical use. After a lengthy discussion of consciousness, one of his favourite subjects, he used hallucinations of the insane as a practical application.

They may be of subjective origin, that is dependent wholly upon morbid encephalic changes, or they may be partly objective, that is the impressions of an object may be the exciting causes of the internal changes upon which the hallucinations depend, yet the object itself appears to be something else.

Laycock knew a bystander could prove the data of an insane person's consciousness to be erroneous, but common sense does that; Laycock felt he had added much more. People like Bushnan may well ask "if a man cannot believe his own senses and his own consciousness, what is there left for him to trust?" This, Laycock said, was the argument of every mysticist and spiritualist.(62) An obituarist wrote, referring to Mind and Brian,

"if his [Laycock's] lucidity had been equal to his depth and his power of exposition equal to his thinking, his book would have marked an epoch alike in physiology and

psychology.* All agreed that the effort and work was prodigious. In its aim to unite psychology with neurophysiology, and to unite psycho-physiology with philosophy and psychiatry, the volumes deserve to be remembered as a landmark on the long and difficult road of understanding mind and brain

In a dedication of a small booklet of 1857 to the students of the University of Edinburgh, Thomas Laycock wrote

You are entering upon life at an epoch, which in the opinion of many will be signalised by a conflict of principles. While science is penetrating into the domain of dogmatic theology and unsettling creeds, outspoken atheism openly attacks the principles of religion...

When a similar conflict of opinion took place in the last century the University of Edinburgh rallied round the tricolour flag of religion, science and common sense - the flag of Scottish philosophy.

Let us again raise the Scottish tricolour: (63)

A synthesis of science, philosophy and religion was, to a large extent, the story of Laycock's life,

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CHAPTER 8

THOMAS LAYCOCK AND MEDICAL EDUCATION

Apprenticeship and Hospital based training

The nineteenth century was a period of transition in medical education from the apprenticeship system to hospital based systematic instruction and an associated change from separate qualifications in surgery and medicine to combined qualifications. Laycock's training encompassed both approaches. William and John Spence to whom he was apprenticed were probably as good as, if not better than, the average country town surgeon apothecary, yet Laycock was acutely aware of his deficiencies when he came to London to undertake the required courses in anatomy, medicine, surgery and pathology in order to sit the examinations for membership of the Royal College of Surgeons and licentiateship of the Society of Apothecaries.

A great deficiency in Laycock's view was that many students had an inadequate basic education, being ignorant of the classics, French and rudiments of mathematics.(1). He contended every student should have a good preliminary education in both arts and science before starting the study of medicine proper. This reform was to be a long process. In 1866 the General Medical Council recommended the preliminary examination should include four compulsory subjects (a) English language including grammar and composition, (b) Arithmetic including vulgar and decimal fractions, (c) Geometry including the first two books of Euclid. (d) Latin, (e) A fifth subject chosen from Greek, French, German and Natural Philosophy, but the standards were not high as the object was to improve the educational attainments of the mass of general practitioners. This situation was to continue for as late as 1920 poor literary

standards were commented on at the Conjoint examination. A full and instructive account of nineteenth century medical educational reform is given by Newman (2). However the essence of education for Laycock was self education and persevering industry, the rewards should not be medals or honours but medical appointments.

Laycock's views on apprenticeship are expressed in a letter written on 6th Nov. 1833 to a Mrs. Outhwaite of Richmond, Yorkshire -

Dear Madam, You mentioned some time ago your intention of educating your son William for the Medical profession. I have always felt a little interested in his success in his studies, and thinking you might be apprenticing him prematurely, should a favourable opportunity occur or rather one favourable to your views, I have ventured to write for the purpose of advising you not to apprentice him upon any consideration. I will tell you the reason.

Changes have been long agitated in the profession which will come under the notice of Parliament this winter and it is not improbable that the apprenticeship will be abolished altogether or very much shortened in its term which at present is five years. (3)

Events were to show Laycock was over optimistic in the time in which he considered there would be radical changes to the apprenticeship system.

Later the fate of the boy was related

The mother [a widow] delayed taking the necessary steps to educate her son. Let loose on the world he enlisted in one of our hussar regiments (a magnificent soldier he made) and his bones have been for many years bleaching somewhere on the plains of the Indies. (4)

Whilst in London Laycock spent fourteen months with some attachment to the Westminster General Dispensary (5) and this, combined with his period with Mr Spence ensured he had considerable experience in seeing patients either at their own homes or as

outpatients. He was frequently to voice the value of dispensaries although he also appreciated the value of the hospital where patients with similar symptoms and conditions could be assembled in numbers for treatment, study and teaching and where some physical examinations were much easier. It is likely that because of unstable family conditions many, during the period of the Industrial Revolution died in hospital without known next of kin, there was thus ample opportunity for autopsies and the correlation of signs and symptoms with morbid anatomy.

Combined training in Medicine and Surgery

By the beginning of the nineteenth century it was increasingly being recognised that medicine, surgery and therapeutics were inseparable and that the competent medical man required a basic training in all these together with obstetrics and pathology. Surgery was passing from an inferior position to becoming therapeutically effective, scientifically based and socially acceptable.(6) Risse (7) gives this as a reason for the union of medicine and surgery in Scotland.

With the need for combined training Laycock agreed, and addressed this problem in a review of a German work on the subject by Von. Walther professor of medicine in the University of Munich (8). The article commenced with a historical account of professional divisions of medicine and surgery in Germany when there had been grades of medicine, an upper class and a lower class with lesser qualifications and training and whose members tended the poorer section of society. This is followed by a shorter section on the situation in England.

With regard to education of physicians and surgeons, Von Walther advanced three propositions. The first was that every physician needed to know something of surgery and secondly every surgeon needed to know the basics of general medicine. In the United Kingdom events moved slowly compared with Europe and the union of medicine and surgery occurred only after the Medical Act of 1858. Even then the Royal

College of Surgeons and the Royal College of Physicians conducted and examined for their own diplomas, but the General Medical Council ensured that students had a training in both medicine and surgery.

Von Walther's third proposition was that it was undesirable to have an inferior grade of person to whom physicians indicated surgery to be performed. This was also ruled out in Britain after the 1858 Medical Act.

With all of Von Walther's propositions Laycock concurred and in addition remarked:

Midwifery is an ungentlemanly branch of practice, consequently those members of the College of Surgeons who practice obstetric surgery are too degraded to be eligible for a seat on the Council.

Laycock practised midwifery when in York and thought the subject deserved better recognition. After strongly advocating equality of rank on the union of medicine and surgery Laycock concluded

Surely it is time that these unpolitic divisions in medicine should cease. Let there be one qualification and one faculty and within that as many subdivisions as the necessities of the public and the progress of medical science require.

Lecture courses at York

Many of Laycock's views on general medicine were contained in his lectures on medical subjects and he often included in these the mind-brain relationship and its associated philosophy.

The medical school at York was a very small one, it being estimated that there were at most probably about twenty students and possibly about a dozen when Hughlings Jackson entered the school.(9). Its small size was a factor in its closure, but in spite of size, the quality of instruction was good, a close relationship developed

between staff and pupils so that the teachers knew the strengths and weaknesses of students and any social problems which might beset them.

The separation of clinical medicine from more theoretical medicine as given in lectures can present difficulties, as the theory and practice are closely intertwined. Laycock gives his lectures a definite abstract and philosophical character, perhaps more suited to discussing mental illness than everyday physical ailments and their physical signs.

When first appointed to the York Medical School in 1846 (10), Laycock published a lecture for new students giving a synopsis of the course he was to hold. Initially he gave some moral and ethical advice on how their duties should be performed in view of the importance of their success to friends, the profession, and their own future careers and the misery and disgrace which ultimately overtook the idle and vicious student. He was thinking of his own ambitions and some of the students he encountered in London. Next winter there was to be a demonstration course but they should not let the summer pass without making use of it; there were many diseases peculiar to the summer season, and the students were invited to communicate with Laycock personally at the dispensary and to visit and report on patients in their own homes.

The lecture then proceeded to a discourse on methods of clinical practice, which are of interest as they show the changing ideas of the time. Laycock's approach was contemporary in outlook in so far as he said the clinical observations indicated the structure of an organ in terms of the morbid anatomy and symptoms resulted from the disordered function of that organ. Pathology could only be inferred in life and clinical examination had to be thorough to ensure correct diagnosis. Autopsies confirmed or corrected a clinical diagnoses.

The very concept of physical diagnosis was novel at the time. Reiser (11) has explained how in the seventeenth century doctors treated fevers, fluxes and dropsies, and therapy attempted to restore a balance of humours to relieve symptoms.

A different approach was advocated by Thomas Sydenham (1624-89) who considered there was a recurring pattern of symptoms which allowed illness to be

ordered into a finite number of distinct species such as were used for listing plant species. Classifications based on symptoms were put forward by Sauvages and Cullen, in spite of Cullen's realisation of the importance of autopsies he did not perform them to any extent. An autopsy could, in the opinion of the nosologists, divert a doctor's attention away from the study of patients and their illnesses and means of treating them.(12)

In the eighteenth century Morgagni carefully described the symptoms of a number of patients together with the anatomical findings after death thus laying a foundation for morbid anatomy. Matthew Baillie followed a similar course in London.(13)

It was in France that a turning point in physical examination and diagnosis occurred. Auenbrugger introduced percussion in the later 18th century but initially it failed to attract much attention. It was Corvisart who at the turn of the century demonstrated its clinical value. This was followed by Laennec, inventor of the stethoscope and an outstanding clinician who developed auscultation, thus completing the classical method of physical examination, inspection, palpation, percussion and auscultation (14). With a knowledge of morbid anatomy it became possible to state the expected pathology and to give a prognosis. Unfortunately this did not lead to any better treatment for the patient.(15).

In his lecture, Laycock digressed from clinical matters to turn to philosophy in which the reading of Bacon in the original Latin was stressed and the reading of works by Herschel and Whewell commended to students. The latter had published two volumes on the inductive sciences and it was suggested to balance views between philosophy and theology, a criticism by a physiologist in the British and Foreign Medical Review (Vol.5) should be read. Whewell's work had been criticised by J.S.Mill on the question of logic in the inductive process and on the notion of inconceivability as a test of validity. (16).

Returning to medical matters Laycock continued with clinical observation and instruments which aided the senses. The microscope, an essential instrument, was said

to have become cheap, although Laycock found a simple Coddington lens very efficient for the examination of excreta and in skin diseases. The metal tongue depressor only served the same purpose as the silver spoon, and ear speculae were cones which came in various sizes and were associated with physician's names. Vaginal speculae were described and the two blade form was said to be preferable. On their use Laycock gave a special word of warning to the young, as although the instrument was valuable they could expose themselves to unpleasant scandal unless they were careful. Partly the reluctance of women to be examined by the instrument was due to the practice in the U.K. of not exposing women in labour, whereas on the Continent where they were exposed at childbirth, there was less aversion to the use of the speculum.

Aids to hearing were the pleximeter and stethoscope. Various types of pleximeters and percussors were available but Laycock thought the middle of the middle finger and the tip of the other middle finger were as effective and more convenient: it was an art which required practice. It surprised Laycock that the stethoscope remained undiscovered for so long, and he considered the best instrument was the one that suited the individual best; Laycock favoured the wooden cylinder, presumably the one seen in his Wellcome Institute portrait. Instruction in the use of the stethoscope would be given in the clinical situation and not in lectures.

The use of a stethoscope in the United Kingdom had been pioneered in Edinburgh by James Hope, William Cullen Jr. and others in the 1820's, but as late as the 1840's there was still some opposition to its use in London (14). From 1830-1860 the use of percussion and auscultation with the stethoscope developed allowing the diagnosis of much pulmonary and cardiac pathology during life although considerable experience was required to develop the necessary clinical skills.

Measurements had to be exact and Laycock said he used a measuring tape forty inches long which wound up by a spring so that it was no bigger than a crown piece, although the case wasn't very satisfactory; it would have been better had the case been made of ivory.

An indispensable instrument was the watch for timing respiratory and cardiac rates; students needed this initially so that they could later estimate these by inspection or palpation only; Laycock prided himself in these examination skills and in practice did without a watch. The thermometer to measure temperature and urinometer, to measure the specific gravity of urine were also quoted useful instruments.

On history taking Laycock told students to start by letting patients tell their own story, although sometimes they would talk of what their wife or neighbour said about his condition. Here the doctor may have to interrupt with specific questions although always in a way sympathetic to the patient. The medical history including the parents' health, his occupation, illnesses in childhood, past illnesses and history of the present condition had to be enquired into. While this history was being discussed, it was necessary for the doctor to use his eyes and ears, although they would often enter a room with the blinds down and curtains drawn. Nevertheless the patient must be seen in a good light even if he had to be helped to turn over or sit up in bed "as innumerable signs of disease were written on the face", a subject on which Laycock often dwelt at length.

In addition to emotional states being shown on the face there was the classical Hippocratic facies; students were instructed to look for the vacant and unmeaningful stare of insanity, the downcast eyes of tabes dorsalis, the anxious look of the hypochondriac and the expanding nostrils of the child with pneumonia. The complexion was important, the pallid anxious face of cardio-renal disease with bluish lips and periorbital oedema, the muddy tint of typhus with redness of the cheeks, the red and white complexion of phthisis and the yellow colour of liver disease had to be remembered and looked for. With abdominal disease the patient often had the knees drawn up and an anxious look; chronic peritoneal disease was indicated by withdrawn lips while the old man who was standing up holding the back of a chair and trying to exhale was suffering from emphysema. The patient's voice should be noted, as a deep cavernous voice could indicate cavities in the lungs and it was suggested that whilst the patient was giving his history it was useful to note how long he could speak

without drawing a breath, an approximate test of respiratory and cardiac efficiency. Examination of the tongue should not be neglected and it could be useful to ask the patient to open his mouth for this examination if he became garrulous. Diseases particular to special occupations and locations had to be known and the sense of smell may be useful in deciding whether a poor child came from a home with only one room or from one with more than one room, all surely sound advice to medical students.

Single symptoms could be misleading, the whole of the symptoms together with the examination had to be taken into account, although at times Laycock himself jumped to conclusions. The treatment would be prescribed when the diagnosis was made, using a knowledge of materia medica. Then having seen the patient and prescribed, Laycock said the patient had to be seen again using the same methods of examination as before.

Laycock was certainly aware of the teaching of the leading medical schools of Paris, of the methods of physical examination and physical diagnosis. He was capable of teaching them and did so, but he equally did not wish to overthrow old teachings. Laycock's practice was based on reading observation and reason, he told the students:

You have collected a number of observations and you next have to generalise them and see what points of the generalisation resemble or differ from analogous or apparently similar generalisations in systems of medicine. This implies a previous knowledge of the distinguishing or diagnostic categories of those generalisations or in other words of nosology.

They were exalted in the following words to consider always the object of their work.

Although I wish you at present rather to turn your attention to pathological phenomenon rather than therapeutic indications you must bear in mind that the great object of all your labours, studies and investigations is the cure or relief of disease in man. Never lose sight of the patient.

Teaching at Edinburgh

The Medical Times of 1862 (17) contains records of eleven lectures and over thirty-three pages as an introduction to Laycock's course on clinical medicine. In the first and introductory lecture Laycock said he proposed to advise the class on his arrangements for teaching. Clinical studies would of necessity be conducted on the clinical wards but again the value of dispensaries was stressed as they afforded experience in patients' homes, something which was required to make them good practitioners. The plan to be followed was 1. Classes of six to eight students would meet in the evenings to study physical diagnosis. 2. During these visits more advanced students would take the patient's history and practise physiognomical, physical and general diagnosis together with causes and remedies. The stethoscope, microscope and chemical reagents would be used but not given prominence as a method of examination. 3. Although cases would be discussed at the bedside special groups of patients would be considered at biweekly discourses. 4. There would be a competitive examination for eight clinical clerkships. It is evident that only a minority of students would have the opportunity of clerking, as there were some four hundred students spread over four years.

Clinical instruction in Edinburgh can be seen to have changed vastly from that experienced by Robert Graves in 1819. He described the situation:

Two clinical clerks, one for the male and one for the female wards were selected by the physician from among the senior pupils; their business is to write an accurate history of the cases, to report on the effect of medicines, and to record the symptoms which may have occurred since the physician's last visit. All this is generally done with fidelity and zeal. At his daily visit the physician stops at the bed of each patient and having received the necessary information from his clerk, he examines the patient, interrogating him in a loud voice while the clerk repeats the

patient's answer in a tone of voice equally loud. This is done to enable the whole audience to understand what is going on: but indeed when the crowd of students is considerable, it is no easy task; it requires an exertion almost stentorian to render this conversation between the physician and his patient audible to the more distant members of his class: while the impossibility of seeing the patient obliges all who are not in his immediate vicinity to trust solely to their ears for information. (18)

Virtually the whole of the published lectures of Laycock were devoted to the physiognomical diagnosis of disease; it is a very extended version of the final part of his York Medical School publication and shows the thought Laycock had given to developing a union of neurology, physiognomy, diathesis and temperament. He intended to use the word constitution loosely to cover temperament, diathesis and cachexia; constitution thus used would include the way John Rutherford, his eighteenth century predecessor, used it to account for the same disease running different courses in different patients. By diathesis was meant a tendency only to disease and cachexia was the manifestation of that disease. Laycock's individual ideas on diathesis are explored in the following chapter. Of this ancient Bynum (term) has written:

If a patient develops the disease for which he had a diathesis the point was proved. If he did not through careful living, premature death or fortuitous circumstances this did not prove he was lacking the diathesis but merely it had not expressed itself. (19)

An added interest is that Mr Macfarlan, a university student, took photographs of patients, one being post mortem, from which cuts were made for printing. Medical photography was being developed by several people during the 1850's, an early pioneer being Hugh Diamond at the Surrey County Asylum and he was followed by Crichton Browne at the West Riding Asylum who supplied Charles Darwin with photographs for The Expression of the Emotions in Man and Animals. To understand Laycock it is

necessary to appreciate that physiognomy for Laycock was more than a facial appearance; it encompassed all that could be seen by visual inspection. This included the appearance of the hands and skin and a detailed description of ears, teeth, the palate, the palm and even handwriting. Lavater (an earlier exponent of physiognomy) is said to have distinguished between physiognomy, the art, and physionomy the science, but Laycock could see no advantage in this distinction. Lavater's work had been improved by Gall who introduced 'cranioscopy'.

Earlier an account had been given of how mental characteristics gave rise to a characteristic facies.

the continual use of a muscle develops that muscle; it increases the number of constituent fibrils and renders it more prominent; consequently any set of muscles of the face brought into continuous and instinctive action by the incident excitator operation of impressions on a predominant cerebral organ will become more developed and will thus mark permanently in the features, the lineaments expressive of the action of that particular organ. Further the muscles are attached to bones and their processes are determined by the action of the muscles attached to them.

He further went on to say that the hard and soft parts of the face were influenced by nutrition which was itself subject to nervous control.(20). There was a firm link between mind and brain and facial appearance. By instinct we were all physiognomists said Laycock, a situation in line with that described by Jordanova (21) who explains that medical physiognomy was only part of the general subject and that there was confusion because medical physiognomy was a subject which could be clinically taught while the deduction of temperament from facial appearances was instinctive.No two individuals were alike physically or pathologically and three photographs were shown, a woman with melancholia, an idiot with hare lip and a case of dementia taken from a patient postmortem. The last is that of a thin young man and one is left wondering about the history of the patient and what the present day diagnosis would be. Laycock described the development medical physiognomy:

this method of physiognomical diagnosis may be variously divided and subdivided according to the object aimed at. In the early stages of medical art the method was limited to general symptoms..... and even now general diseases such as fevers are diagnosed in this way. With the advance of anatomy and physiology, the method has been rendered more minutely available.

One aspect of medical physiognomy was empirical, e.g. the classical Hippocratic and other facies. This type of knowledge could only be obtained by bedside experience, but for his part Laycock intended to teach a more scientific physiognomy.

Physiognomy and temperament had been linked through the ages and Laycock thought

Certain constitutional elements are common to all men but they are not all equally active or developed in the same proportion in all men, hence the words temper or temperament from the Latin tempero or temper, to mix as temper, as in mortar. In the Elizabethan age the word humour was used in a similar sense being derived from the humoral theory of constitution.

Six types of temperament were recognised; 1. Nervous temperament, 2. sanguine temperament, 3. fibrous or bilious temperament, 4. phlegmatic temperament; 5. lymphatic temperament, 6. melancholic temperament; four of these seem identical with the humoral theory, and associated with instinctive physiognomy. The perfect type was that where all fundamental elements were equally and harmoniously balanced, a state termed 'eucrasia' by the Greeks and 'gute mischung' by the Germans. Excessive development of one fundamental element resulted in a tendency to a morbid condition. The classification by temperament which itself depended on organisation became manifest by a recognisable difference in facial appearance (physiognomy) which was also related to diathesis. In one section Laycock wrote of race and temperament, a common theme but not a sensitive issue in Laycock's day and he concluded. "The quality of the nervous system and the claim of large headed men to mental superiority over small

headed men (Laycock said he was one of the latter) had not been substantiated." He proceeded to link temperaments and physiognomy with diathesis which in turn was bound up with the subjects constitution. A tendency only to a given morbid change was he said a diathesis but the development of that change was a cachexia, "or in more modern terms a dyscrasia or temperament". The term diathesis, a vague one of great antiquity which became common in the eighteenth century and more so in the nineteenth century possibly to fill the aetiological void created by abandoning the humoral theory.(22)The standards for physiognomy varied according to age, sex, race, rank and occupation, explained Laycock, and students had to learn to recognise the normal as they did in auscultation, and he intended to deal with physiognomy in relation to constitution, diathesis and cachexia.

Diathesis, temperament and disease formed a complex association. The neurovascular diathesis was common in the U.K. being associated with a brain more developed in the frontal and middle region and less in the basilar region. This in turn could result from an extra good vascular activity (the sanguine temperament) and gave rise to the neurovascular temperament to which some of the most distinguished members of the profession belonged. Laycock continued at length to link the vascular system of the face and the brain and claimed the typical John Bull was of the neurosanguine temperament.

Normal standards were then discussed in detail; woodcut portraits of the Hunter brothers were shown, William was a well known example of the nervous temperament with a gouty diathesis (neuroarthritic).He was smart and dapper with small but mobile features and thin lips and alae nasi. Although very temperate he became a martyr to gout at 60 and died of hemiplegia at 64. John Hunter exhibited the strumous arthritic diathesis, but in him the gouty tendency resulted in atheroma as well as gout and he died of angina pectoris. John was of short stature. florid complexion, round forehead and thick lips and alae nasi. The difference in the brothers was attributed to their father being in his seventieth year when John was conceived. Laycock believed only the tendency was inherited and not the morbid state or cachexia, and supported by observing that in

hereditary syphilis the baby was born healthy but the morbid state was not manifest until weeks, months or even years after birth.

Those with a sanguine form of the neuro arthritic diathesis had a tendency to gouty disease. showed a florid facies and their hair turned grey early in life. Depressing conditions however could modify tissues in youth and old age, giving rise to nervous afflictions, degeneration of the left side of the heart and vascular system causing angina pectoris, valvular spasms and various haemorrhagic states. Subjects with the sanguine temperament who were prone to a atheromatous cachexia could be distinguished by a senile arcus and corded temporal or radial arteries, These signs indicated only a tendency towards atheroma or fatty change as the senile arcus could be due to local conditions. The lymphatic temperament was a degenerate form characterised by inactivity and gloomy disparaging ideas which took the place of confidence; it depended on either defective nutrition and nervous action or defective vascular activity of the nervous centres. The person was usually large with a pale face and flabby muscles, a degenerate John Bull. The melancholic temperament was also associated with defective innervation which was manifest by inactivity and gloomy disparaging ideas. Scotland had a wide variety of mixed temperaments probably due to racial mixtures, Celts, Romans, Saxon, Scandinavians and Norman. The late Professor Alison was an educated man with a sanguine temperament and arthritic diathesis, while his cousin, the late Professor Gregory was of the lymphatic temperament and rheumatic diathesis; both had an hereditary tendency towards gout. None of this makes much sense to a modern reader and possibly didn't to many of the students who would have been familiar with the writings and teaching of the less conservative Edinburgh physicans Bennett and Gairdner. Laycock used the word gout in various ways; it could mean any type of arthritis inspite of Sydenham's classic account of gout and in his journal Laycock referred to his 'gouty knee' which was a tuberculous arthritis.

An association of temperament with handwriting was described. This came about because neurovascular activity determined muscular movement of extremities as

well as physiognomy. Degenerations recapitulated some of the material described in the classification of mental illness and mental deficiency. (chapter 5) A class of luxury imbeciles (spoilt children) was noted. Laycock wrote "You must not however expect to find what we might call luxury imbeciles exclusively among the rich and educated classes". Cartoon drawings from Punch were given to show facial appearances of various types of luxury imbeciles. Cretins and microcephalics were also illustrated by drawing of facial appearances together with dental casts exhibiting malocclusion and a high arched palate. Various deformities of, and types of ear were described and illustrated by drawings. A typical poverty cretin had the facial appear of a cretin found in the Swiss Alps and else where, a condition thought to be caused by defective nutrition. As explained elsewhere the 'degenerations' for Laycock implied a reversed evolution which could be hereditary.

One lecture was devoted to diathetic diagnosis of pulmonary consumption and started by saying it was very common in the hospital wards and so strongly linked with poor hygiene that some had denied a link to constitution or diathesis. Nevertheless Laycock did discuss widely differing conditions such as syphilitic, scrofulous and rheumatic disease which frequently occurred in conjunction with consumption and bone and joint tuberculosis, but it was conceded no firm conclusions could be drawn. He felt the students had had enough of the microscopic anatomy of the tubercle, at least for the time being and it was important to understand the conditions under which pulmonary tubercle arose. The formation of tubercles in the lung was linked with scrofula (tuberculosis cervical adenitis) so that it had to be asked whether any particular diathesis predisposed to scrofula.

Laycock drew attention to long-standing controversies, as to whether any differences existed between scrofulosis and tuberculosis and the constituents of the tubercle, whether it was a deposit or whether it resulted from inflammation.

Pulmonary consumption was extremely common and Laycock queried whether there was a special diathesis as he had seen it in all manner of patients, the dark, the fair, those with large heads, those with small heads, children with protruberent bellies and

those without and those with narrow chests. Nevertheless Laycock thought that a scrofulous diathesis existed, and that scrofula was related to pulmonary tuberculosis which could occur even when there was no diathesis or pre-tubercular stage. Depressing conditions acted upon the respiratory centre predisposing those convalescent from other illnesses or with melancholia to pulmonary tubercle. The disease was common in asylums because there was cerebral malfunction which led to respiratory inefficiency. Laycock rightly considered the disease affected chiefly the lung apices because of deficient oxygen supply in those regions.

The physiognomy of the scrofulous diathesis related to the blood, the tissues of the glandular system and mucous membranes. The nearest description Laycock could give was that of the goitrous cretin, but because it was a degenerative condition the facial appearance might be that of a European mongol or of a much younger subject. A portrait was used as an illustration taken from Morel of a young female with a goitre. Laycock thought the forehead was projecting, the alae nasii thickened and the face assymetrical.

Two types of tubercle existed, the yellow associated with lymphatic glands/ the gastrointestinal track and the mucous membrane of the bronchii. The second type of tubercle the grey (granulations of Laennec) occurred in the air cells or connective tissue of the lung. That a different type of tissue was involved carried significance. It was the yellow type of tubercle which was associated with the scrofulous diathesis.

Next Laycock passed on to consider clinical information gained by inspection of the hand and drawings were presented showing clubbed fingers, which he appreciated were associated with cyanosis, and the rheumatoid hand which resembled the scrofulous hand (tuberculous dactylitis). After noting the spread of scrofula and syphilis in large towns due to licentious behaviour which in turn was linked with constitution and nutrition, the physiognomy of the syphilo-strumous was described. Here Laycock acknowledged a large debt to his friend and former pupil Johnathan Hutchinson. The description which followed was that of the congenital syphilitic; the nose with a

sunken bridge, corneal opacities, rhagades about the mouth and abnormalities of the secondary teeth including notching of the upper incisors and peg like lower ones.

Laycock attempted to link physiognomy with mind (23) and recalled that Albertus Magnus, a thirteenth century monk, divided the cranium (or ventricles) phrenologically into three regions, the anterior relating to judgement, the middle to imagination and the posterior to memory.

The forms taken by the face and head in man and vertebrates, the gestures, the play of the facial muscles represent the internal operation of vital forces associated with mental states. The face expresses emotions or feelings as do gestures, vocal sounds and bodily action. Laycock then explained that many phrenologists were, in fact, expert physiognomists and used this art as well as cranial palpation. He said of phrenology

although I thus dissent from the physiognomical method of phrenology, considered as a sufficient method of inquiry, and from physiognomical doctrines considered as a science, I by no means wish to deny the diagnostic value and observations of the forms of the head and face in reference to mental character.

The organs described by phrenologists were especially doubted.

So keen was Laycock on diathesis and physiognomy that he sought to verify an opinion based on these subjects by means of a urine test (24). He thought the family history in the arthritic diathesis was often negative and in spite of searching the literature he could not find any method of confirming such a diathesis. Often he had observed a mucus cloud in the urine of patients with gout or rheumatism and which showed on microscopic examination (a) multiple nucleate cells which when treated with acetic acid formed cells with two or four nucleii, (b) rounded masses of granules varying in appearance from an agglutination of nuclei to imperfectly defined cells with many nuclei, (c) free nucleii as granules. There may coincidentally be other bodies, urates or other salts, epithelial cells, spermatozoa or cells from the vagina.

The urine from every diathetically rheumatic or arthritic patient admitted to the wards during a three months period was examined. These amounted to eleven in all

showing the diathesis and these all exhibited the same urinary findings. It was claimed they differed both in diathesis from other patients in the wards although cases of renal disease had many abnormalities in the urine including casts. Laycock conceded it was possible that where there was no diathesis the urinary organ may undergo a similar change. The paper had originally been presented at the Edinburgh Medico-Chirurgical Society when William Gairdner remarked that similar urinary findings could be seen in cases of gonorrhoea in whom all signs of urethritis had disappeared. Laycock replied that this could not apply to one of the eleven patients who was a thirteen year old girl with erythema nodosum: he thought a girl of thirteen would be most unlikely to have had gonorrhoea. Erythraemia nodosum is now known to be associated with a number of conditions, including tuberculosis.

The tenth lecture marked a turning point to less speculative clinical medicine and pathology. Many patients who were in the wards were cited and would doubtless have been known to the students. The subject dealt with was the diathetic diagnosis of Bright's disease and cardiac and renal dropsies, a subject on which Laycock wrote at length elsewhere (25). Attention was drawn to the frequent association of pulmonary consumption with Bright's disease [nephritis of various types] and two types of tuberculous kidney were described, the yellow one [with a mass of caseous material] when the primary seat was in the mucous membrane, or the grey type with abnormalities seen in the parenchyma or capsule. Possibly renal tuberculosis was often in life misdiagnosed as Bright's disease. The waxy, lardaceous or amyloid kidney was recognised but differed from scrofulous degeneration in that the smallest blood vessels seemed to be the seat of degeneration and scrofula a secondary phenomenon. According to Laycock "in the true scrofulous kidney mucous membranes, lymphatic and cell producing glands were primarily involved" and the diathesis "is usually a low type of the vascular-rheumatic or strumous-rheumatic or there are marks of the syphilo-strumous constitution." Histology was still a developing subject when the paper was written

In an attempt to answer the question whether the renal disease in patients with pulmonary tuberculosis was primary or an intercurrent illness, Laycock said that degeneration (pathology) of the kidney was intercurrent or followed on the lung disease. The diathesis of those with renal disease was very like those with pulmonary disease.

A case of a young German glass worker with anasarca was cited where granular casts in the urine indicated a renal cause for the condition; no comment was made on the presence or absence of red blood cells. Diagnosis was often difficult as there had been fifteen recent cases of anasarca or oedema, some with and some without either albuminuria or cardiac disease; and there had been four cases of unexplained albuminuria without anasarca.

The lecture continued with a discussion on the causes of anasarca and recorded that from ancient times it had been held to be due to a general cachectic state; Sydenham modifying this to a serous cachexia or wasting state of the blood. This was not the case however when they examined the blood of the German glass blower; his blood did not show hydremia and Laycock did not consider a few days of albuminuria could lead to such a gross abnormality. Much of the further discussion on anasarca and dropsies is identical with those which are considered under the heading general medicine (chapter 8).

The final lecture dealt with blood diseases and students were informed that the facial colour depended on the blood in the capillaries and the colour of the epidermis. Laycock remarked there was a form of leukaemia as the students had abundant opportunity of seeing, that was associated with large white granulated corpuscles. The word leukaemia originated with Virchow. [a subject considered more fully in the next chapter]. At the time total white cell counts and differential counts were not possible so that the polymorphic leucocytosis was more associated with suppuration than inflammatory processes and long continued suppuration not generally recognised as the cause of amyloid kidney.

A further case history was that of a sailor with pulmonary tuberculosis and sea scurvy, about whom Laycock remarked that although the mucous membranes paled, the

patient had a swarthy tint which resembled the bronzing of supra renal disease. The possibility of his tuberculosis affecting the suprarenal glands and causing Addison's disease was not mentioned.

The condition of the red blood corpuscle was considered in some detail. In many cases of diabetes mellitus and early phthisis the red cells were normal but there was an excess of smaller lymph corpuscles, an accurate observation. Large white granular bodies indicated leukaemia and even larger white cells were seen in blood from erysipelatous tissue. Absence of rouleaux formation with pale flabby red cells which floated along with the serum occurred in splenic leukaemia and Bright's disease.

Yellowness of the skin was common in liver disease and could be mechanical due to retention of bile, a situation which might occur in yellow fever although in this condition its colour was more generalised. Some yellowness might be due to used up blood corpuscles, although not explicitly stated obstructive jaundice seems to be differentiated from haemolytic. Sallow or bronzed skin may be mistaken for the jaundiced tint, in fact a degree of yellowness occurred in the conjunctivae of some races of mankind.

A swarthy or dark skin could be associated with blood diseases, but it might occur independently; for example silver nitrate could cause dark brown stains. Elaborate tattooing especially if red lead or gunpowder had been used could result in diffuse staining; a blue tint was often seen in the skin of miners especially in old scars. Black jaundice was seen with incurable skin disease and general bronzing in Dr Addison's disease. Many localised conditions caused local pigmentation such as previous herpes, eczema or where a mustard plaster had been applied causing blisters

Heat and light affected the skin as with freckles or the liver tinted stain on the legs of old people caused by sitting in front of the fire. The whole series of lectures show a fascinating side to Laycock; he stands with one foot in the past dwelling on physiognomy and diathesis and the other in a more modern era of leukaemia, amyloidosis and Addison's disease. It was typical of Laycock that he tried to effect a

synthesis of the two and unfortunate for him that this was such a sterile exercise. Both medicine and pathology were to change vastly in the succeeding half century.

These were only introductory lectures as many others would be given by Laycock on the main bodily systems. The Laycock manuscripts at the Edinburgh Royal College of Physicians contain a comprehensive list of lectures which would supplement those published, and cover all the bodily systems together with other subjects such as fevers, inflammation and sanitation.

Psychiatric Education

Specialist psychiatric hospitals have existed in Europe since the Middle Ages yet it was the late eighteenth or early nineteenth century before there was any interest in teaching the subject. The founders of St. Luke's Hospital (1751) gave as one of the consequences of its foundation.

More gentlemen of the faculty might be introduced to the study and practice of a branch of physic too long confined to almost a single person (26) .

This referred to James Monro (1680-1752) the first of four generations of non-resident physicians at the Bethlem Hospital who refused to admit students or physicians for instruction as he considered "Madness is a distemper of such a nature very little of real use can be said concerning it". This situation was not remedied until 1843 when physicians' pupils were first allowed at that hospital but for some twenty years their presence was only intermittent. (27)

It is likely that Laycock included some psychological medicine in the Practice of Medicine lectures he gave at the York Medical School. It was however, at Edinburgh that he had his greatest influence on psychiatric education; an account of the Edinburgh school of psychiatry is given by Beveridge (28). As early as 1823 Sir Alexander Morison requested the University to create a chair in mental diseases with himself as

the occupant. This was rejected as were approaches to the Royal College of Physicians in Edinburgh and the Town Council. Nevertheless Morison did lecture on mental illness for a period of thirty years even if his audience was minute.(29)

The next person to teach on mental illness was the first superintendent of the Royal Edinburgh Asylum William MacKinnon , and this was continued by the next superintendent David Skae who started teaching at Morningside Asylum in 1853. This was given impetus by the Royal College of Physicians, as the East India Company required its doctors, many of whom came from Scotland, to have some knowledge of mental diseases.

Soon after his appointment to the Chair of Medicine in Edinburgh (1855) Laycock sought to establish the teaching of medical psychology. In 1857-8 he set aside one lecture each week for a course of practical psychology.

The syllabus for these lectures was recorded in a legible hand by a class assistant together with examination questions which were of a practical and clinical nature. A transcription follows,(30)

Practical Psychology

Syllabus of Early Lectures 1857-58

Mr Wilson, Class Assistant

Books for Consultation

***Mr J.S.Mill's System of Logic Book III - on Induction - Chapters 1 to
7 and Chapters 11 - 12 - 14 - 16 - 20.***

***Sir Wm.Hamilton's Note A (Reid's Works) On the Philosophy of Common Sense
especially Section 6th.***

Mr J.D.Morell's Elements of Psychology - Part I. Chapters 1 and 2.

Practical Psychology

Syllabus of Lecture II

- 1. Practical Psychology - an Art.***
- II. Experience Considered as a source of its fundamental principles***
- III. Detection and exclusion of false principles***
- IV. Statement of some fundamental principles of experience.***
 - 1. Unity of man's "concrete ego" Sir William Hamilton.***
 - 2. Unity of all states of conscious existence.***
 - 3. Self consciousness is knowledge.***
 - 4. The concrete ego only conditionally conscious.***
 - 5. Consciousness as a matter of experience defined.***
 - 6. Duality of man's nature.***
 - 7. The soul or "immaterial ego" exists independently of concrete consciousness.***
 - 8. Consciousness and soul not synonymous in experience.***
 - 9. Instinct proved by experience to be a manifestation of mind.***
 - 10. Comparison of instinct and reason.***
 - 11. The fundamental empirical Law of Instinct and Reason a Law of necessary adaption to ends.***
 - 12. All the Phenomena of Life fundamentally spiritual or psychal.***
- V. Limitation of Inquiry.***
- VI. General Considerations.***
- VII. Summary of Results of Inquiry.***

Syllabus of Lecture III

Principles of Classification

A. Philosophical.

B. Physiological.

I. Morphological II. Biological III. Mental

A. Philosophical

I. Law of Continuity

II. Law of Complexity

B. Physiological

I. Morphological

***Organismic Evolution of Structures (Differentiation) with
Specialisation of Function.***

II. Biological

1. Dynamic Development - Vital Instincts

***i. Histogenetic Development - Corpuscular Processes
Specialisation of Tissues.***

ii. Organic Development

***a. Specialisation of Nerve Structures - Sympathetic System
Animal Instincts.***

b. Subordination (to them) of organs.

c. Integration of nerve structures - spinal system.

III. Mental.

a. Specialisation of Cerebral Structures

Mental Organology - Phrenology

b. Higher subordination of organs

c. Higher integration of nerve structures - cerebro - spinal system.

Psychological Classification

Basis - Evolution of Law of necessary adaptations

A. Normal B. Abnormal

A. Normal.

I. Morphological

Evolution of and Specialisation - Primordial or Vital Instincts.

- 1. Application of Forces of Matter***
- 2. Alimentation (Appropriation of Matter)***
- 3. Assimilation (Nutrition)***
- 4. Formation and Development***
- 5. Protection and Defense against Forces of Matter***
- 6. Repair of Structures***
- 7. Deprivation of Structures***
- 8. Curation or Restoration to healthy activity from disorder.***
- 9. Generation or reproduction***
- 10. Psychal - Special adaptation to probable failures of plan under varying circumstances.***

II. Biological -

Special Instincts.

- 1. The Organic (Vital)***
- 2. Instrumental (Animal Instinct Proper)***
 - a. Individual***
 - b. Domestic***
 - i. Sexual, ii. Parental, iii. Filial***
 - c. Communistic or Sociological.***
 - i. Alimentative, ii. Reproductive, iii. Defensive***

B. Abnormal

Primordial Failures of Plan

- 1. Morphological, ending in deformity, disease or death.**
 - a. Monstrous forms**
 - b. Bizarre or Ugly forms.**
 - c. Useless organs**
 - d. Deformed organs.**
- 2. Dynamical, ending in disease or death - failures in plan of**
 - a. Curation**
 - b. Deprivation**
 - c. Defense**
 - d. Special adaptations**
 - e. Generation (Hereditary diseases)**
- 3. Mental**
- 4. Sociological**

Vertical Section of Cerebrum - Cerebellum - Pons -

Medulla Oblongata

1. *Olfactory Nerve*
2. *Optic Nerve connected with Thalamus*
3. *Motor Nerve of the Eye*
4. *Trochlear Nerve*
5. *Superior Maxillary Branch of 5th*
 - 5.1 *Ophthalmic Branch of 5th*
 - 5.2 *Inferior Maxillary Branch of 5th*
6. *Abducens Nerve*
7. *Facial Nerve*
 - 7.1 *Acoustic Nerve*
8. *Glossopharyngeal Nerve*
 - 8.1 *Pneumogastric Nerve*
 - 8.2 *Spinal accessory*
9. *The Hypoglossal*
10. *First Cervical Nerve*
 - I. *Of what Mental Diseases are Amnesia and Dysnesia chiefly characteristic; and with what changes in the nervous structure are they believed to be connected?*
 - II. *Describe General Paresis. Divide it into four stages and trace its characteristic psychical phenomenon into its primitive elements in the healthy mind.*
 - III. *Describe the difference between Erotomania and Nymphomania.*
 - IV. *Give the Symptoms of Anaemic Melancholia and the Medical Treatment.*
 - V. *What should form the basis of the Nosology of the Vesaniae?*
 - VI. *State a few of the principles upon which Moral Treatment has been founded.*
 - VII. *To what physical conditions is Idiocy generally attributable?*

VIII. Describe the species of Puerperal Insanity and their treatment.

IX. In what forms of Mental Disease have Digitalis, Acetate of Morphia and Iodide of Potassium been chiefly recommended?

X. Are the Insane capable of distinguishing right from wrong? Describe the modes in which Conscientiousness (in the sense of justice) may be affected in Insanity.

The pathological anatomy had little to do with insanity and consisted of simple neuro-anatomy. This was inevitable as neuropathology had hardly started to develop at that time and even today no abnormal pathology is found at autopsy in the vast majority of psychotic patients. In the summer of 1858 he was requested by the Senatus Academicus to give a summer course of lectures on medical psychology which commenced in 1859 (31). This did not satisfy Laycock for in 1859 he wrote to the Senate requesting beds in the local asylum: extracts from his lengthy letter read "I beg to submit-----the importance of teachers of medical psychology having access to wards of a public asylum that he may be enabled to give practical instruction in the treatment of the insane, that is in psychological medicine. The summer course recently initiated by the Senatus Academicus will meet a want long felt in the British Schools of Medicine. The reciprocal relations of body and mind in the causation and cure of disease have attracted the attention of able physicians in every age." Reasons were then given why practical instruction was required in addition to lectures .

1. The University of Edinburgh has taken the lead of kindred institutions in the United Kingdom in giving this important department of medical science an academic position.
2. Owing to the greater care taken of the insane there are fewer deaths to those living so that without ---an actual increase in insanity in the population at large there is a considerable increase in the

numbers of insane. 3. Owing to the rapid increase in the insane and of hospitals for the reception of them there is a greater demand for duly qualified medical officers and superintendents.

4. Other medical schools (as the extra academic schools here) offer the proper facilities for the clinical study of insanity (32).

As David Skae refused access to the Morningside Asylum, probably because he resented intrusion into his established domain, Laycock took his class to the Millholm Private Asylum at Musselburgh for clinical instruction.

A comprehensive set of notes prepared by a medical student, William Carmichael McIntosh records some of Laycock's lectures from November 1859 - July 1860 together with notes taken at the Musselburgh Asylum from May to July 1860 (33).

Musselburgh at this time was described by Edward Jarvis as having

Twelve houses kept by individuals licensed by the proper authorities for the insane. The numbers vary from one patient in the smallest to ninety nine in the largest. They are all paupers supported by their respective towns.

The notes on the Practice of Physic are in two groups, November 1859 to March 1860 and March to July 1860, together covering some thirty-three lectures. For the most part the hand writing is legible and the general appearance of the notes is neat and orderly. They are however not easy to read as abbreviations are used, words joined together and phrases disjointed. Diathesis, especially with the adjective gouty, and cachexia figure prominently. Lectures themselves were numbered and dated initially but this became less consistent towards the end of the period. From the general medicine lectures it is evident that some pains were taken to ensure that practical guidance was given to students. Symptoms, various stages of disease and where appropriate remarks on pathology were made. Frequently treatments and medications were advocated, the latter including antacids, diaphoretics and inevitably Laycock's favourite prescriptions "blue pill"(34). The notes are probably incomplete as there are none dealing with

cardiac or pulmonary disease, so that it is impossible to say to what extent these conditions and their physical signs were discussed. In a few places faces are drawn, one of a young man with various whisker ornamentations; these are "doodles" rather than illustrations of Laycock on physiognomy. From May 1860 lecture notes appear which start with the heading "Medical Psychology" and subjects considered include relations of life to consciousness, organology (neurology with diagrams), pain including the phantom pains following amputation, sexual and other instincts and the nosology of insanity. At one point passions are considered and these differed from emotions in that they were more egotistical or selfish. A higher class of emotions was sentiments such as love or grief. It seems that Laycock did not intend that those students who did not go to the Musselburgh Asylum should escape instruction on some of his favourite subjects.

The notes from Musselburgh made by McIntosh cover some ten or eleven sessions, the first being a lecture devoted to idiocy, and the remainder covering such topics as hypochondriasis or melancholia, which figured prominently, impulsive insanity, chronic mental illness and dementia. In Laycock's view masturbation led to dementia. These sessions were mostly associated with or consisted entirely of case presentations, although they do not appear to be those in which students make the presentations with corrections from the professor. In some patients the current social conditions are reflected in patients' symptoms. One melancholic woman thought she was a lost soul because the minister told her so and the minister told a similar patient she was a devil, but the patient stated she had no intention of killing herself on that account. A melancholic male who had attempted suicide by cutting his throat had dug his own grave. One session was devoted to the admission of patients to asylums or mental hospitals and described the differences in procedure in England and Scotland. There can be no doubt that those undergraduates who attended Laycock's practical classes in medical psychology must have obtained some valuable information which would help them in their future careers.

During the session 1866-7 when Laycock who suffered from tuberculosis of his left knee and had a mid thigh amputation, Dr Warburton Begbie took his classes in general medicine and W.A.F. Browne (the father of Sir James Crichton Browne) the classes in medical psychology.(35). On the death of Skae in 1873 Laycock approached the new superintendent, Thomas Clouston, who agreed to Laycock's class attending the Asylum for instruction twice a week in the summer session. Thomas Clouston gave demonstrations to the class in "the Pathological Anatomy of Insanity and Cognate Diseases of the Nervous System". (Sir Thomas Clouston is discussed in some detail in Chapter 10). Laycock obtained permission for putting a question on mental diseases in the Edinburgh M.D. degree in 1857 and he strongly advocated mental illness as being part of the syllabus for instruction for medical qualifications, although this was not recognised as necessary by the G.M.C. until 1885.

By 1864 the fabric of the buildings of the old infirmary were in an unsatisfactory state and the need for extensive rebuilding was realised: the dominant question was whether to rebuild on the old site or to find a new one.

A letter from Laycock to the managers of the Royal Infirmary in March 1865 (36) drew attention to his summer course on medical psychology with mental diseases and suggested a re-arrangement of use and medical responsibility for teaching wards. He wished to admit patients suffering from the earliest stages of mental illness when cure was most likely. This was an important part of the medical students education. Bennett did not like this arrangement and prolonged correspondence on the matter ensued. In July the managers of the Royal Infirmary received a letter from the secretary of the Lunacy Board asking why a patient had initially been admitted to the Royal Infirmary and then transferred to the Edinburgh Asylum. Dr Sanders replied that the action had been taken by the resident medical officer and Sanders explained that patients often presented with complaints from the relatives that they were "wrong in the head" and on examination the patient may be found to have typhus, inflammation of the lungs, brain, or delirium tremens. If the case was one of pure insanity the patient was transferred to

the asylum. In the event the managers decided no beds were to be allocated to Laycock in the Royal Infirmary for treating patients with mental illness.

Laycock did not easily give up and a letter of 1871 related that he had long struggled to ensure medical psychology was part of the practice of medicine. He had written to the Building Committee and provision for the clinical teaching of medical psychology was to be made in the new building.(31). A syllabus extracted from the Edinburgh University Calendar of 1870-1 was given at the end of a letter which indicated that special forms of mental disorder would be illustrated by drawings and photographs. Medical psychology was given a very wide interpretation as it included symptoms of somatic disease, pain, hunger, thirst and bizarre appetite.

Although in 1864 the fabric of the buildings of the old infirmary had been recognised as being in an unsatisfactory state and the necessity of extensive rebuilding was realised; there was much discussion as to whether to rebuild on the old site or to find a new one. Eventually the present situation in Lauriston place was selected and the foundation stone laid in 1870 with a plan for 500 beds.(37). The building however was not opened until 1879, after Laycock's death. This long incubation period explains Laycock's letters and the gap between them.

Laycock as a teacher

A medical teacher may be successful as one who is eloquent, capable of maintaining the attention of students and imparting knowledge to enable them to pass examinations. On the other hand he might be a poor lecturer and yet an able clinician in demonstrating bedside skills of physical examination and diagnosis or he may be able in stimulating students to follow or initiate research.

When a student and writing of the surgeon Samuel Cooper, Laycock thought he was "totally wanting in that manly, fearless and unhesitating enunciation, that commanding, dignified yet familiar deportment and deliberate elocution so captivating

to the medical students." (38). This being his ideal, in some respects Laycock never came up to it, one student recorded his lectures were not fluent, he frequently resorted to drinks of water, the lectures being mostly read but occasionally explanations or illustrations were given extempore. He was of small stature and known to his pupils as 'periblinkles' because he wore spectacles. However he did maintain his ideal in that he was always well dressed and dignified. (39). It seems possible that the poor elocution and lack of humour was in part due to uncertainty of his basic philosophical position to which he had devoted so much time and thought since he was a student. Characteristically his lectures were well prepared, constantly updated and copious notes written on the blackboard before a lecture for the benefit of students. In spite of this his general medical lectures were not very popular but as an examiner Laycock was considered fair or even lenient (40). There may have been the odd occasion when humour was shown at examinations, for Crichton-Browne relates the following episode. Laycock asked a student what the definition was of an acute illness to which the student replied there was no definition.

'You must have heard me say in my lectures that an acute illness was one that ran its course in fourteen days' Laycock said. 'Sir' replied the student 'an omnibus runs from Leith to Edinburgh in 20 minutes but that is not a definition of an omnibus.' (41).

One suspects that many of the stories about Laycock were generated by students as were those of Spooner. Laycock as a clinician will be considered in a later chapter as will his influence in inspiring a few of his more able students who were able to follow his involved thinking. There was however another side to Laycock as a teacher; he was the only member of the professorial staff who enquired from students where they were living and took his students, in groups, to his house for breakfast .(42)

By contrast to his lectures in General Medicine, those in Medical Psychology were reported as popular and at the end of the course a certificate awarded jointly by the Commissioners for Scotland and the Professor, could be obtained. MacLeod also says

that after obtaining such a certificate in 1861, Laycock recommended him for a post in an asylum and kept in touch with him by correspondence on subjects relating to insanity and asylum management. (43).

Examination of available class lists shows that those in general medicine were persistently better attended than those in medical psychology although the latter were given in the summer when attendance was often poor. The classes in medical psychology increased in numbers while those in general medicine tended to decline.(44)

Year	General medicine	Medical Psychology
1871-2	80	21
1872-3	77	23
1874-5	63	26
1875-6	66	37

✧ **Laycock, The Medico-Psychological Association (Training and Education)**

The Medico-Psychological Association became a body representing those who worked in asylums, but others interested in mental illness joined as did Thomas Laycock in 1860 having first attended the annual meeting at Edinburgh in 1858 as a guest.(45)

Laycock proved himself a friend of Assistant Medical Officers of Asylums when he wrote in 1868 suggesting that although £70 or £80 p.a. might be the starting salary, attendance at a specialised course of instruction in mental diseases should be required together with the passing of an examination at the end of the period. There should then be annual increases in salary with all eventually entitled to the pay and pension of superintendents. In addition accommodation should be provided for wives of second or junior superintendents.(46). He was chosen president elect of The Association in 1869 (47) and for his Presidential Address he chose the title "The Objects and

Organisation of the Medico Psychological Association". In this he took the Association to task for certain of its deficiencies, but continued

It would ill become me having thus probed and laid bare your infirm state with what, I fear, will be thought by some a reckless and ruthless hand not to indicate the remedies.

Although Laycock had claimed a wide range in which medical psychology could be practised, he said members of the association were practitioners of an applied mental science. The word applied was required because

at Edinburgh degrees in mental science are granted the curriculum for which comprises, in addition to a degree in arts logic, metaphysics and moral philosophy with political economy to the exclusion of mental physiology. These subjects were formerly designated at Oxford science simply; now they are more correctly termed philosophy and, according to Professor Rolleston the 'Science School' includes the sciences cultivated by Huxley, Helmholtz and Müller. In Edinburgh the curriculum for degrees in science proper includes the same subjects but in Germany they constitute the curriculum for degrees in philosophy. Such is the confusion in academic terms.(48)

Many who worked in asylums felt their training inadequate for the duties they were expected to carry out and for this reason it was suggested in 1866 the Association conducted its own examination and award a certificate in Medical Psychology.(49) Laycock suggested the formation of an educational subcommittee to supervise and administer such a certificate. Although the certificate was instituted in 1886 it was not until 1893 that the Association adopted the suggestion and appointed an educational subcommittee.(50)

Women Medical Students.

In 1870 seven women students who had matriculated at the University of Edinburgh applied for tickets to attend medical and surgical classes at the Infirmary. After protracted negotiations involving Miss Sophia Jex-Blake, the managers in 1872 instructed their clerk to write to all medical and surgical staff enquiring

1. Whether it was possible to admit Female Students on exactly the same terms as Male students, giving the reason for their opinion.
2. If it was considered not possible to admit Female students on the same terms as Males could any scheme be suggested for them to obtain a qualifying course of instruction at the Infirmary.

Laycock considered the admission of Female Students on the same terms as male students impossible as this would not be acceptable to the patient's feelings, the surgeons and physicians would be restricted in their teaching and the ladies themselves would often feel compelled to absent themselves or "do violence to the best feelings of their nature"

Most of the other physicians and surgeons, including Joseph Lister replied to the first question in similar vein.

In reply to the second question Laycock was the only one to give factual evidence. The number of beds and the number of students at three London hospitals Guy's, St. Bartholomew's and the London were given. They had 1966 beds for 672 students while Edinburgh had only 400 beds for 653 students.

Moreover if 80 beds were set aside for 12 Female Students, as had been suggested this would mean $\frac{1}{5}$ of the total beds would be allotted to $\frac{1}{50}$ th. of the total number of students. He asked if the fees would be distributed accordingly. (51) It is evident that reformist as Laycock was on most medical subjects he was not enthusiastic about the admission of women to the profession.

Although he failed to fulfil his high ambitions as a teacher at Edinburgh his achievements in psychological medicine were by no means negligible.

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CHAPTER 9

GENERAL MEDICINE

Ideas and knowledge in general medicine, in pathology, in physiology and in histology were to change vastly in the mid nineteenth century. Old doctrines such as that of the humours were laid to rest, that of sympathies to vastly modify, Rudolf Virchow changed pathology(1) and the practices of bleeding and cupping declined(2). Laycock's writings and reviews were extremely wide ranging extending over conditions of the chest, heart, kidneys, blood, skin, intestines, joints and especially the nervous system; some of his thoughts and orientation to general medicine have already been described in his outlines for the lectures at York and more especially at Edinburgh. These dealt with his favourite subjects and illustrated his thinking on physiognomy and diathesis; neurology featured prominently and Laycock exercised much ingenuity in weaving coherent theories.

Proleptics or Periodic Illness

After Laycock's change of style when writing his hysteria papers it was logical for him to select a subject with as wide ranging laws or principles as possible.

Critical days or periods is a very ancient concept in medicine; a subject in which Laycock was interested throughout his life and one to which he gave extra theoretical refinement. In the Lancet of 1842-4 (3) he published seven articles on periodic phenomena and about the same time fresh Continental literature on the same subject appeared.(4) Laycock's interest in the subject developed at the time of writing his hysteria paper when he was observing the timing of menstrual periods; these "Proleptic"

papers were based on a paper he read at the 1842 Meeting of the British Association for the Advancement of Science, the subject name being from a compound Greek verb *Prolambano anticipo*. Laycock loved to use classical names and in a few instances to invent new ones. The idea of predicting events in medicine was an extremely ancient one, used by astrologers, but it was accepted by physicians that certain events occurred at regular (or more or less regular) intervals of time.

Laycock endeavoured to find a general law of periodicity in the phenomena of life arising from various observations of recurring events. He studied several books on natural history noting the periods of uterogestation in lower animals. Critical days were also noted in the exanthemata, the occurrence of periodic haemorrhages and ague, and the times of onset and remissions in gout.

The second paper stated that an attempt should be made to harmonise critical days in health and vital days in physiology and pathology. These could generally be stated as the fourth, seventh, eleventh, fourteenth, twentieth (or twenty-first) and twenty-eighth days. Latent periods and other manifestations may show some variations due to the different concentrations of poison entering the body. Laycock thought of fevers as a branch of toxicology from analogy with arsenic poisoning. A large dose might give rise to instant symptoms or repeated small doses could result in symptoms at a later date.

In his papers Laycock proposed to analyse his general law more minutely.

He built a theory based on "The first period" of twelve hours which was a barometric or lunar day because it contained one maximum and one minimum reading on the barometer and one maximum and one minimum of temperature, and one maximum and one minimum of "electric tension". Double this formed the solar day and when quadrupled the tertian period. The twelve hour day was the one on which Laycock thought all calculation should be made.

The period of seven solar days (two weeks of barometric days) governed an immense number of natural phenomena. After calling attention to the monthly menstrual cycle in women, Laycock discussed insects and considered four chief periods

(a) hatching from the ova; (b) the caterpillar or larval state together with moults; (c) the crystalis period; (d) the adult state when reproduction started again.

The ova hatched in varying periods, the shortest being seven lunar days or half a solar week as in the wasp, but in others it was a week and a half, for example in the black caterpillar, although in the majority of insects from two to six weeks. The larval period varied but seldom lasted less than seven days; it could continue for months and the time occupied between each moult being limited in proportion as the larval state itself was limited. In the pupa state the period obeyed the common law of regulation by weeks, although the exact period changed. Laycock regretted few observations had been made on the duration of the adult reproductive period, but it appeared to bear out the law of weeks. The hatching of fish ova, hatching of birds eggs and the period of gestation in mammals all obeyed the same law which was in keeping with the overall principle of continuity.

From this point Laycock passed to the well known periods in the infectious diseases, discussing those of latency and remission of exanthematous fevers. He quoted Sydenham who said smallpox erupted on the fourth day; a vesicular suppuration appeared on the eighth day, the disease abated on the eleventh and disappeared on the fourteenth. If the pustules coalesced on the eighth day this indicated danger with further danger on the fourteenth day in the irregular form. Most vital periods related to Laycock's "heptals" of four solar half days. He examined typhus, scarlet fever, rubella and shingles in the same way, and continued with the periods of intermission and exacerbation in tertian and quartan ague. A case of manic depressive illness at The Retreat was described who had been observed for 14 years and it was found that "switch" days alternated between tertian and quartan periods. Periodic events did not always occur exactly at expected times as the amount of poison entering the body and causing the disease could vary as could the patients' resistance to disease.

The basis of Laycock's ideas was the hypothesis of a regular sequence of critical days in the healthy person predisposing to the outbreak of disease, the sequence beginning at conception. There were critical days in the development of the embryo and

in infant and pubescent life as instanced by the stages in dentition. If two persons were conceived at the same hour, and developed under the same circumstances as might happen with twins, illnesses would develop at the same time. The same idea was used to explain death by the same disease in members of the same family and children by the same mother. The time of conception could correspond, the sequence of events could also correspond and have a common relationship with the mother's time of ovulation and menstruation. Laycock thought

Every family should possess its medical history with exact dates, just as the nation its archives, and illustrated by a series of Daguerrotype portraits. The physician could then have data which might enable him to anticipate hereditary disease, and if not to prevent its development at least predict its occurrence and modify its influence.

Laycock then discussed other diseases according to the law of vital periods and claimed resistance to disease might be above or below par at certain critical times. Various factors determined the patient's resistance such as season, climate, meteorological conditions (wind, rain, temperature) and even the sun and the moon. Life itself had certain vital periods and they were three (not seven as for Shakespeare). Laycock's three periods were from intra-uterine life to complete maturity of sexual organs, 21 years, the second in which those organs were active 28 years, and the third 21 years all multiples of 7 and totalling three score years and ten. Laycock described the antiquity of periodic systems of life and discussed the place of Pythagoras and Hippocrates in the history of proleptics.

A Commentator on Laycock's and similar papers wrote

If the laws of periodicity be considered in all their relations, their mysterious antiquity, their practical importance, their infinite extent, their connection with the most immense phenomena of the universe, and the most minute, they cannot fail to attract philosophic minds to their study. (5)

This was certainly true of Thomas Laycock. In the years 1842-3 he must have devoted a considerable amount of time and thought to a general law of periodicity in life.

Medical Text Books

Having obtained a chair of medicine Laycock appropriately produced a volume of lectures on the Principles and Methods of Medical Observation and Research (6). A prefatory note said he looked about for some elementary work on inductive philosophy he could recommend to his class. He found several sufficiently able manuals of physical diagnosis adapted to students, and good elementary works on the uses of the microscope and the routine in clinical wards, but he

found none which instructed the medical student in an easy form, how to use his reason; none which explains to him in especial the nature of the mental processes by which knowledge is acquired in his particular sphere of labour; none which leads him to the applications to practical medicine of those aids to the intellectual powers which modern inductive philosophy uses so commonly and efficiently.

The contents were arranged as seven lectures although Laycock wrote "Of the lectures themselves it may be stated that for want of time none of them were delivered extenso and some were not delivered at all."

Lecture 1 dealt with empiricism, the necessity of theories and various fallacies which may arise. Laycock contended empiricism was no more infallible than theory.

Lecture 2 dealt with aids to observation, the senses and physiognomical diagnosis.

On the subject of instruments or 'aids', students were warned against valuing them too highly and of pursuing the study of them too exclusively.

Microscopy had many fallacies even in the experienced hands leading to differing views among the experts. Similarly with

the stethoscope although in a less extensive way. Everyone knows how long a time is required to train the best ear to that detection of delicate degrees of tone which is requisite to the reliable use of the instrument in the diagnosis of the more obscure forms of structural disease; and how signally the best stethoscopist sometimes fails even in cases in which unaided but experienced observation triumphs.

Students were informed that the use of instruments was often time consuming and their use in practice often impracticable, and they were told by far the greater number of you will necessarily have to meet the varied exigencies of general practice, and these, for the most part are incompatible with much instrumental research.

For the most part Laycock preferred to use his unaided senses and was against what he would have considered 'modern gadgets' but stopped short of denying their value or discounting their use. Towards the end of his life he recognised the value of the ophthalmoscope. His lecture notes on auscultation (7) started by describing eighteen varieties of monaural stethoscopes. Many different types of breath sounds were mentioned, bronchial, tracheal and pharyngeal, but what was meant by the latter was unclear.

He listed the usual added sounds as described by Laennec, râles, rhonchi of various notes (bubbles and whistles) and crepitations but no comments were made on the underlying pathology from the findings. The plural rub was referred to, together with bronchophony (or vocal fremitus) and whispering pectoriloquy which indicated a cavity. In general the respiratory findings of Laennec were given without his account of the sounds from the heart although Laycock was well aware of the need for, and practised, cardiac auscultation.

Lecture 3 was on the inspection of the patient, the general examination and the first theory or deduction; the history and orderly examination of the viscera were discussed together with the reason for what Laycock termed the natural methods;

inevitably these included diatheses and cachexia and physiognomy. This covered much the same ground as was later covered in more detail(8).

Lecture 4 on prognosis, especially involved critical days and seasonal or meteorological change. This chapter repeats much that had been previously written in the proleptics paper.

Lecture 5. Fallacies in relation to therapeutics and management, the exercise of a moral control and influence over the patient, i.e. the doctor's own influence and the necessity of advice on the patient's life style. Students were warned not to be impatient for results.

Lecture 6. The numerical method in medicine and its importance for research in medicine and in public health. The method also had its fallacies.

Lecture 7. Dealt with various methods of research, analogical, philosophical or inductive. Some practical examples were given in dermatology which included histological discussion.

This volume contrasts with J.H.Bennett's Lectures on Clinical Medicine 1856 which is less verbose, devoted to more practical detail to the clinical examination and describes microscope findings. Most students would have probably preferred to purchase Bennett's book even if they disliked him as a person.

A review of Laycock's volume in the Edinburgh Medical Journal noted some of the best observers had no great familiarity with abstract philosophy, and theory was best evolved from practice. Never the less Laycock's opinion that we had to theorise while knowledge was imperfect was accepted. Laycock had made a contribution to this part of medical literature. The section on statistics was thought to be extremely good.(9) Eight years later (1864) a second edition of Laycock's work was produced and in the introductory note he wrote

If the practitioner who entered the profession thirty or forty years ago compares the past condition of the science and practice of medicine with the present, he must be more or less impressed with the difference. At that date the science of physiology, or

more correctly of biology upon which the whole of medicine rests was just beginning to take its present form.

Much of the work however remained the same but a Part II was added on the naming and classification of diseases. Views on medical classification had been previously expressed (10) when it was said that this had to be based both on structure and function; but chiefly on structure as this varied less than function.

Laycock's opinion of medical text books was expressed when he reviewed A Treatise on the Practice of Medicine by G.B.Wood (11). This work was seventeen hundred pages in length in royal octavo and Laycock commented

that voluminousness is the characteristic of all systematic writers for the shelves groan beneath the weight of modern thick octavos or less modern quarto or older folios. A refuge from the evil has been sought in 'Libraries' or 'Cyclopedias' or 'Dictionaries' but sought in vain for these are more voluminous still. 'Conspectuses' and 'Manuals' have been tried and have met with some success: but the generalities of a 'conspectus' are too abstract for any than the most abstract mind, and the dry summaries of a manual too dogmatic and general for the practitioner unless edited with masterly tact.

Laycock appears to have failed to realise that most undergraduates would have fared better with a more practical manual with a somewhat dogmatic approach.

Pulmonary Disease

Chest diseases being extremely common in the early and mid nineteenth century it was to be expected Laycock would write on them.

The second paper published by Laycock in his youth (12) referred to fetid bronchitis and gangrenous pneumonia, cases to which he was to return later in life. A

general lecture on bronchitis, which was delivered at the York Medical School and published in 1847 (13) started by stressing the importance of atmospheric temperature and stated that in November of the preceding year there had been a mild spell followed by a sudden drop in temperature and this coincided with an increase in death from pulmonary disease. In fact Laycock said a drop of temperature was always accompanied by an increase in pulmonary illness, the reason being that most of the sufferers already had some chronic disease of the lungs and the cold air incited inflammation of the air tubes. Twenty one cases of pulmonary illness had been seen at the dispensary but there was only one case of pneumonia and one of pleurisy among them, and both of these had preceding pulmonary disease.

The use of the stethoscope was mentioned and findings with it reported as variable because of complications or associated disease. Many must have presented with an acute exacerbation of a chronic lung condition. A frequent complication was a low fever of a remittent or intermittent type and a few cases were briefly reported. One man who had been seen by Laycock came from nearby low ground in the neighbourhood of York; he had a cough, respiratory difficulty and pyrexia; blue pill, henbane and quinine were prescribed with marked improvement. He also described an eight year old girl who died of pulmonary disease and Laycock commented that many of the patients who presented in Spring or Autumn had a malarious diathesis or cachexia. The adverse effects of cold, especially on the young and elderly sick was recognised, although associated hypothermia was not mentioned.

In addition to his use of reflexes Thomas Laycock endeavoured to involve the nervous system in diverse conditions in various ways. The following are examples of this.

A curious form of bronchorrhoea (or excessive sputum) was bronchitis faetida in which the mucopurulent sputum smelt like faeces. Laycock had seen three or four cases and he referred back to the first case he published. After discussion of treatment two types of bronchitis were said to occur, the arthritic and the gouty; in making this division Laycock referred to the ancient theme of diathesies and cachexias and his own

ideas on diatheses. The gouty bronchitis occurred in those with chronic cardiac or pulmonary disease which could lead to difficulty when bleeding the patient; this should be carried out with the finger on the radial artery. If the pulse became fuller and stronger and breathing easier all was well, but in some the feeble pulse became even more enfeebled. A warning was also given to students on the use of opium in bronchitis, the clearance of mucus must not be hindered by drugs; Laycock suggested that patients should be told the cough was a safeguard to prevent the lungs becoming clogged with phlegm. Attention was drawn to the dangers of opiates and squill obtained from druggists for quietening the cough of children; a common but dangerous practice of the time when all drugs were freely available from shops.

A further paper on fetid bronchitis was published in The Medical Times and Gazette of 1857 (8) describing three cases, the report being made by Mr. Low, clinical clerk, with comments by Laycock. The odour of fetid bronchitis differed from that of pulmonary gangrene and was, said Laycock, characteristic of butyric acid and a new chemical compound, ethyl butyrate used to flavour confectionary.

It was thought these changes were produced in the lungs consequent upon some change in the ganglia of the pneumogastric (vagus) and of "the sympathetic in connection with the pulmonary mucous surface, of an asthenia character". Laycock was led to this view by Claude Bernard who had found irritating the floor of the fourth ventricle resulted in sugar in the urine. The floor of the fourth ventricle was the ganglionic origin of the pneumogastric nerve which by analogy in Laycock's opinion acted on the blood as it passed through the lungs abnormally altering organic compounds.

One case which came to autopsy had an occlusion of the left inferior cerebellar artery and this was thought to be connected with fetid bronchitis. Laycock concluded "that a participation of the nervous system in certain morbid pulmonary states will be found to be of much more frequent occurrence than is even suspected at present."

He endeavoured to involve the nervous system in the development of pathological conditions: a thesis to which he repeatedly turned.

Yet another paper on fetid bronchitis appeared in 1865 (15) in response to an earlier paper in the Edinburgh Medical Journal on cases of fetid bronchitis and pulmonary gangrene. Laycock's paper entitled "Notes on Fetid Bronchitis and other Lung Disease with Fetid Breath", referred back to his paper of 1857 and claimed he was the first to publish results of a chemical examination. This paper again described some clinical observations but although based on clinical observation, was overlain with unsupported speculation. Cases with fetid breath were divided into three classes, firstly those in which there was no lung disease as fetid breath could result from carious teeth, gangrene of the mouth or septic tonsils from which fetid material was expressed. A woman in this section had fetid breath without signs or symptoms of pulmonary disease and it was suggested odour might arise without structural disease of the bronchi or lung parenchymia. In patients where the fetid odour was less marked the term "particular odour" was recommended.

The second class of patient with fetid breath comprised those with bronchorrhoea or bronchopneumonia with or without dilated bronchi. The essential of this class was copious fetid sputum yet the patient in most cases went on living for years, although a serious complication of sudden onset may occur at any time. Several authors, including Laennec and Elliotson were reported to have observed the long continuance of life in such patients. The amount of sputum could vary from a few ounces to two or three pints in twentyfour hours.

On the pathology of the condition, Laycock said he relied on recorded dissections. The mucous membranes of the bronchii were thickened, swollen and of a dull red colour and the extremities of the bronchi became dilated and gangrenous independently of any other lung abnormalities. In some instances the abnormality was limited to one bronchii. Other patients in the Class II had localised lung consolidation but clinically there had been no dullness to percussion, only moist sounds were heard although haemoptysis may have been experienced. The patients appeared to have suffered from bronchiectasis associated with bronchopneumonia, unresolved pneumonia or chronic bronchitis. The third and final group, clinically resembling

consumption, were those with lung abscesses, most of the diagnoses being made at autopsy.

On the nature and origin of pulmonary fetor Laycock observed that a patient with fetid bronchitis and bronchorrhoea could make a spacious ward smell like a privy; the material came from the lung and had a faecal odour. However when the sputa had been exposed to air for a while the odour was "the delicate scent of a decaying apple". In another case it resembled "apple blossom". Three types of odour could be observed, faecal, ozaena (resembling chlorine) and that from pulmonary gangrene. Laycock described that from gangrene as so bad that he felt sick when examining such a patient with a stethoscope.

The odour in pulmonary gangrene was due to putrifying pulmonary tissue or perhaps infused blood and a "ferment" might be present. In other cases of ozaena and those with a faecal smell the odour was due to putrefaction of the bronchial secretions and this left unanswered the question of why some patients with a purulent bronchietasis developed particular odours.

The reason was said to be that some special constituent of the morid products underwent its own particular decomposition or acted as a ferment in exciting a decomposition of some other constituent. Laycock then lauched into further speculation based on his ideas related to diathesis and considered the exudates and degenerations in the lung were similar to those of rheumatic origin in which lactic acid played a part, but the lactic acid was further metabolised into carbon dioxide and water. Let us suppose, said Laycock, there was an excess of lactic acid or somelike acid and the ordinary decomposition or metabolism interrupted then an irritant is brought into contact with the bronchial mucosa, would be like inhaling chlorine.

Fetid breath had also been observed in pregnancy, scorbutus and cachectic states of a rheumatic nature.

A condition with no overt disease yet associated with a considerable faecal odour was sweaty feet. This was due to perspiration containing some unknown substance which underwent decomposition on exposure to air.

However having said all this Dr Gamgee was quoted as having demonstrated that it was possible to obtain "stinks" from any pulmonary excretion whatever, if they were subjected to appropriate chemical treatment. There was, concluded Laycock, nothing special in the odour of fetid bronchi^{tis} or its causes and the term should be changed to bronchi^{tis} with fetid expectorations.

Characteristic views of Laycock in medicine appear under the heading 'treatment'. Terebinthinate drugs, henbane, belladonna and opium, if there was pain, could be given with advantage and iodine and chlorine could be used as inhalations, although great care in this was rightly regarded as necessary. Iodine could be volatised to mask the unpleasant odour.

Laycock had long been convinced that in some kinds of bronchitis and pneumonia, the sympathetic nerves distributed to the lungs were at fault in the first instance and this led to tissue change which involved capillaries. He therefore thought these conditions originated as "neuroses of nutrition" and had also taught that rheumatic conditions were determined by nerves and nerve centres related to the parts concerned. The occurrence of the same basic change in another part of the body (metastases in the language of the Laycock) also depended on nerves and nerve centres, a view he was to enlarge.

The paper concluded with an appendix of six cases, five of which were Laycock's, including that of Sarah Battley who was described in the first paper of January 1837; one case was a patient of Dr. Low of Kings Lynn.

Bronchiectasis as a disease entity was evidently not clearly recognised and named although it is said to have been first noted by Laennec's assistant Cayal. (16)

Dropsies

Two papers on a clinical inquiry into the influence of the nervous system on Dropsies (17 and 18) were published by Laycock in 1866 in which both cardiac and

renal oedema were considered together with anaemia. Oedema and anasarca (accumulation of fluid in the abdomen and thorax) were extremely common conditions in the nineteenth and early twentieth centuries. It was contended that the then current theories of dropsy in terms of hydraulics and hydrostatics did not take into account the involvement of the nervous system and that the process involved a defect in nutrition. Virchow had discussed dropsy and contended that "oedema fugax, hydrops spasticus, hystericus and paralyticus" occurred in the course of a watery blood state 'hydraemia'. This theory failed to take into account the various clinical states regarding the origin, course and sites of dropsies but if the nervous system was involved in action on the tissues Laycock thought two distinct results were explained, namely the prevention as well as the causation of the watery state and the associated effusion of serum. Already he had directed attention to the subject in three papers. The Medical Times and Gazette of 1861 contained a case which he was again reporting in the current paper. The Medical Times and Gazette for 1862 published a lecture on physiognomical diagnosis in which dropsies, anasarca and the nervous system were discussed and thirdly the Proceedings of the The Royal Medico-Chirurgical Society of London for 1865 contained a paper on the inhibitory or preventive influence of the nervous system in dropsies. He then went on to arrange dropsies according to nervous systems and he discussed centric and reflex dropsies, general dropsies and paraplegic, hemiplegic, facial and other local effusions. Each heading was discussed with case histories.

Nervous Dropsies of centric origin involving primarily the trunk and limbs.

Hemiplegic Dropsy

A 56 year old man with pericarditis was described who persistently laid on his left side and the oedema was predominantly left sided but before he died the oedema involved also the right side. The collection of fluid Laycock said was usually attributed

to gravity or obstruction of a large vein in the neck or shoulder but neither hypothesis could explain this case. Mr. Turner, a demonstrator in anatomy, had been asked to inject water into the subcutaneous tissue of the thorax and abdomen of a corpse, watching how it diffused. From this solitary experiment it was concluded that cellular tissue was continuous and that dropsical fluids could pass from one position to another under physical forces. However Laycock was not entirely convinced by the experiment and quoted a patient with terrific oedema of the face and arms due to a large aneurism pressing on the superior vena cava, but the oedema failed to pass to the abdomen under gravity. Another patient had oedema beginning in the legs and spreading upward but it ceased at the level of the seventh rib and the patient died without further extension of the oedema; if "the bottle filling theory" was correct it should have extended up to the face, hence it followed that although water flowed in the tissues in all directions as in Mr Turner's experiment there must be a special property in the living tissue or of its capillaries which determined the actual distribution of tissue fluid.

A further patient was described in whom, due to pressure of an aneurism, oedema of the face and thorax resulted but this was limited at the level of the sixth or seventh ribs, above this point lividity due to distended venous capillaries could be observed, whereas below the skin was free from capillary congestion. This "precordial vascularity" had been observed in more than one hundred instances in those of emotional temperament and did not correspond to any known anatomical demarcation. These areas of capillary distribution were postulated to have corresponding nerve centres and to have limited interconnection as asymmetry of oedema was so often observed. In considering how cardiac or renal disease leads to dropsy Laycock noted that it is usual to argue right heart inefficiency caused pulmonary congestion for various reasons and anasarca arose from venous congestion. However, many patients were seen with severe pulmonary congestion, a dilated heart and haemoptysis with little or no anasarca. In other instances it was argued there was hydraemia or anaemia in the first instance and this weakened the ability of vessels to contract and thus allowing the too watery serum to transudate; this then acted as an impediment to the arterial circulation requiring

greater cardiac power to overcome it. Enfeebled by poor quality the heart was unequal to the task, thus producing the resulting anasarca.

Laycock concluded there can be no doubt that poor blood and congestion of the tissues and viscera caused by mechanical obstruction of the circulation at the centre, led to dropsy and anasarca, but only if other conditions of the blood and vessels coincided. He asked why dropsy was wholly or partially hemiplegic; by this Laycock meant why was there not perfect symmetry in the serous fluid in tissues or body cavities.

Two cases were quoted in which hemiplegia occurred in conjunction with oedema. The first (case 5 in paper) a woman of thirty years in severe cardiac failure had a cerebro vascular episode resulting in a left hemiplegia most marked in the upper limb but with sensation unimpaired. Breathing and swallowing became more difficult, oedema increased on the left or paralysed side but diminished on the right side. Daniel Haldane (Pathologist to the Infirmary) performed an autopsy and found thickened, incompetent aortic valves, severe mitral stenosis, both ventricles dilated, the right being hypertrophied, the tricuspid orifice dilated and a large globular clot was present in the apex of the left ventricle. A blood clot, similar to that in the left ventricle obstructed the right middle cerebral artery in the fissure of sylvia. Laycock commented that before the discovery of cerebral embolism such a case would have been called one of serous apoplexy and some lessening of oedema looked upon as its cause.

The second case (6 in paper) was of a twenty nine year old male with syphilis and urethral stricture who, two days before admission to the Infirmary, experienced frontal headache, impairment of sight, especially in the right eye and objects assumed curious shapes and colours. Three weeks before this he had experienced an attack of severe giddiness with vomiting which lasted three days. A systolic murmur was heard at the apex and a diastolic murmur over virtually the whole chest. When he had been in the Infirmary ten days he found one morning that he could not lift his left arm normally although he could grip with his hand; there was left facial palsy and the tongue deviated to the left on protrusion, but his left leg was unaffected. Eight days later

oedema affected the left (palsied) side, the right being unaffected. In some five weeks the oedema had virtually disappeared and the patient was discharged.

In this later case the dropsy followed directly upon the hemiplegia and Laycock had no doubt that in both there were two classes of centric nerve lesion associated with anasarca, one in which the central lesion removed the existing anasarca by preventing any further effusion and allowing the absorbents to take up the fluid; in other instances the central nervous lesion could result in the serous effusion and this may be facilitated on one side but inhibited on the other. These cases and remarks showed that Laycock's clinical observations and descriptions were as adequate as many physicians in the Victoria era of change.

Paraplegic Dropsy

This type of oedema affecting the lower extremities was thought by Laycock to be like paraplegia and to have its origin in the spinal cord or encephalon. In some cases of Bright's disease there was a reflex from the kidneys and bladder involving the spinal cord, but in other instances the situation was more complex, as marked excited states of the genital organs had a direct influence on the brain.

Paraplegic dropsy was usually held to be due to gravitation as it was most marked when the patient was upright and diminished in the recumbent position. But Laycock doubted this as a satisfactory explanation and described a patient with advanced syphilis and albuminuria, who before he died, experienced violent pains in his legs with lessening and final disappearance of oedema.

Reflex dropsies due to so-called sympathies

Chronic flux of albumin (albuminuria) which impoverished the state of the blood was generally held to be the cause of facial and eyelid oedema, while an acute state was supposed to be due to the presence of noxious agents such as retained urea or a fibrin poison like that occurring in scarletina. Associated neurological complications might occur such as convulsions, coma or blindness. There was no accurate clinical measure of the blood pressure at the time and hardness of the pulse was not commented on.

Three views were described which were held at that time to account for renal anasarca:

1. The kidneys were primarily affected.
2. The nervous system was affected first, and the kidneys became diseased and the anasarca developed consecutively.
3. That the lumbosacral portion of the cord was disordered by reflex action of both the urinary and genital organ, the renal disease and anasarca then followed.

Inevitably Laycock preferred the third and supported this view by stating that if dropsy arose from the actions of the genito urinary system on the cord, those tissues which sympathised with it must be determined. Possibilities were the tissues of the genital organs, the lumbar region and then the lower extremities. Difficulty came in explaining oedema of the eyelids and in this Laycock used the idea of neurovascular capillary action and cited oedema of the eyelids occurring in emotional persons, in women when menstruating or with chronic uterine disease. In men it was the lower eyelid which was chiefly affected giving the appearance of a bag of water and this, in Laycock's experience, indicated genito urinary disease or haemorrhoids.

Because the thyroid gland and breasts enlarged in women with menstruation and were under the influence of the "utero ovarian system" the neck and thorax may be the site most affected in dropsy. Thoracic dropsy may also be of central origin since the heart is connected with emotions and hence the source of nervous dropsies may be found

in the emotional centres which Laycock places in the lower cervical and upper dorsal region (occulo-spinal region of Claude Bernard). Laycock said that to arrive at his conclusion he had studied the distribution of pain in angina pectoris and found the nerves involved were the "external and internal cutaneous nerves and the intercosto-humeral". It is difficult at times to follow the nomenclature; the sympathetic chain had been termed an intercostal nerve by Willis. Laycock then continued

If then this spinal region have an influence upon dropsical effusions into the cellular tissue of the arms, thorax and eyelids it will be manifest not only by causing but by preventing them. (17 p. 791)

Laycock was undecided on precise neurological details.

It is doubtless a very natural inference from all these considerations that it is the sympathetic or vasomotor system which is involved in dropsies. (18 p. 907)

But such a theory was thought to be too restrictive and dropsical effusions resulted from changes in nerves and nerve centres not involved in ordinary vasomotor, motor or sensory processes but were concerned with nutrition and vegetative life.

Such an element of the nervous system must necessarily underly all others and from the nature of its functions be rightly termed trophical... Whether this trophical system has an influence on the production of water in the body or even the combustion of it, is a question not altogether to be neglected in investigating the dropsies.

The place of a trophic nervous system in pathology was a subject considered in more detail in a subsequent series of papers.

Summing up it was contended:

1. That the nervous system as a whole, or else some special division of it, has a direct influence both on the production and prevention of anasarca.
2. That anasarca is produced when innervation is defective.

3. That anasarca is prevented being manifested locally when the general causes are in operation, by more vigorous because more healthy innervation of the exempted tissues.
4. That centric disease or disorder may have the double effect of facilitating the effusion in one lateral portion of the body, and preventing it in the other lateral portion.
5. That production or prevention alike follow upon changes in innervation, which are induced in the same way, and according to the same laws, as other neuroses; and finally
6. That it is not the sensory. motor or vasomotor systems which are specially involved.

The fact that many neurological conditions occurred without dropsy was said to be due to a different state of the tissues. Laycock recalled a case of purpura and dropsy in an 18 year old girl who had had abdominal pain, weakness and dropsical swelling of the legs with purpura and this patient was diagnosed as suffering from uterine neurosis, although Laycock did remark that the condition was probably the same as that described by Schönlein under the name peliosis rheumatica. It was of rheumatic origin as were cases of acute purpura haemorrhagia. The intimate relation between dropsies, rheumatic and syphilitic degenerations made Laycock think of an abnormality of the capillaries as the immediate cause. Accordingly he had asked for microscopic investigations, and although these had proved negative he was convinced that microscopic research would show a structural degeneration in the vessels in certain kinds of albuminuria and dropsy.

In discussing the anatomy of the tissue changes Laycock claimed cardiac dropsies of rheumatic origin were clinically of a more brawny character than in renal dropsies and Becquenel claimed the effused fluid contained more solid matter. In renal dropsies the subcutaneous tissue contained the fluid whereas in the cardiac and rheumatic form it was thought to be in the muscle.

Laycock developed an elaborate system relating dropsy to the condition of the blood, the diathesis and class of tissue and the nervous system. In further support for function of the nervous system Laycock quoted experimental hemisection of the cord without naming any specific investigator. The aspect emphasised was that on the opposite side to the lesion, there was not only loss of sensation, but diminished heat and vascularity, whereas on the side of the lesion increased heat and vascularity occurred.

What happened in vivisection was therefore likely to happen in morbid conditions of the cerebro spinal axis, and when increased vascularity resulted on one side there was a corresponding decrease on the other; a conclusion Laycock claimed to have reached by studying dropsy.

This theory of dropsies was applied to the treatment and necessitated regard to the condition of the nervous system, the blood, the tissues affected and the organs which eliminate water; the remedies selected were in accordance with then current therapies; nervines, analeptics, diaphoretics and diuretics were administered. He did not mention incision of dependent parts a common practice of the period which continued to modern times. In reading Laycock's papers it is evident that he knew about relevant medical progress of his time, of Virchow's work on hydraemia and on embolism, of Schönlein on purpura, of Bright and the relationship of renal pathology to albuminuria and the significance of urinary casts, of the connection of valvular disease with cardiac failure, of pulmonary disease with rightsided heart failure, and of obstructive phenomena due to aortic aneurism. Laycock's failing was not a lack of contemporary knowledge but in trying to devise all-embracing theories involving obsolete ideas. It is evident that Laycock's views did not represent those common at the time. The author of a text book some 20 years prior to Laycock's writing asked whether dropsy was a symptom rather than a disease in itself, but the author considered that whatever the primary cause of the dropsy might be, it should be treated in its own right. as in so doing the patient was much helped. The mechanism of dropsy involved impaired absorption from lacteals, lymphatics and the veins.(19). It was admitted however that knowledge was incomplete. Modern concepts of osmosis and its measurements did not start until 1870 to 1880. (20).

Tissue Pathology and Therapeutics

A series of articles appeared in the Medical Times and Gazette for 1871 further explaining and consolidating Laycock's ideas on tissue pathology and how the changes and therapeutics could be related to the nervous system. Although written in the last decade of his life they drew together and explained much of his earlier writings (21). Alterations in tissues resulted from changes in a part of the nervous system termed the trophic, which modified certain tissues and organs by the following means. 1. Temperature, 2. The nutrition and growth of tissues, 3. Blood formation and secretory functions of glands, 4. Absorption and removal of waste matter from tissues, 5. Changes in vessels and in the lymphatic system. The trophic nervous system was a more general one than purely vasomotor and abnormalities of the trophic system resulted in trophesies or neuroses.

Chemical combination of elements in a certain order produced vital energy which was a regulator and vital energy evolved into vis nervosa, a higher regulator. Morbid states of the trophic system resulted from abnormalities of the vis nervosa which could be deficient as in paralysis or in excess as in a furious mania. Alterations in the chemistry of tissues and organs produced pathological changes and tissues reverted to a lower evolutionary type.

Motor and sensory neurological function might be affected along with trophic lesions but sometimes the latter only was affected and this could only be known by the resulting trophic neuroses. Laycock then hedged his bets by saying that heat or chemicals might cause pathological changes independently and without involving the trophic nervous system.

The relationship of nutrition to pathology was an ancient one which might be traced back to classical Greece, the humoral theory and "coction". Many including John Hunter, had been interested in the process of digestion of food and the bearing this had on malnutrition and wasting. Having identified a motor and a sensory nervous system

it was a logical step to postulate a trophic nervous system which regulated tissue nutrition. At the time of Laycock's writing the concept of a trophic nervous system had recently been examined by Samuel (22) and Charcot had commented that the trophic theory of Samuel supposed there were nerves similar to the secretomotor nerves which had a direct influence on nutrition where they ended. The theory was discredited by some and a trophic nervous system had never been demonstrated anatomically, and some of Samuel's experiments could not be confirmed. Nevertheless Charcot considered that the trophic nerve theory could best explain phenomena observed by physicians (23). The word trophic is connected with nutrition since the word is derived from a Greek work for food (24).

Ideas on the trophic system remained central to Laycock's thinking in medicine and pathology throughout his life, in spite of changes in his views in other directions. As there was no single word for disorders of nutrition, hypertrophy and atrophy, the word trophies was used to cover all these conditions. Laycock would have used neuroses but that word had already become restricted to functional conditions. Although he realised the exact anatomy of the trophic system was not clear, Laycock felt certain it was not part of conscious life and disorders could arise independently of the sensory and motor systems.

The name vegetative nervous system for the sympathetic trunk was suggested by R.C.Reil in 1807, because it seemed chiefly "concerned with organs and functions of nutrition known since the seventeenth century as vegetative" (25). The chemical basis of nutrition was developing apace at the time when following the pioneer work of Lavoisier certain substances later known as elements, carbon, hydrogen, nitrogen etc. were known not to be interchangeable in the processes of nutrition and digestion. (26.) Laycock thought the ravenous appetite of the diabetic could, in part, be explained by the loss of nutriment through the kidney and the same could apply to the atrophy of tuberculosis. Water was produced in the kidney due to abnormality of the water regulating centre and the hydrogen of the water was taken from hydrocarbons or fats, and oxygen diverted from its proper use, thus causing a trophic chemical neurosis.

Laycock fully realised that blood flow was closely associated with organ and tissue nutrition and he went to great lengths to explain this especially in relation to the blood supply of the brain. Among others he quoted Serres' (Anatomie Comparée du Cerveau 1828) which stated the encephalic centres depended upon the arterial supply for their development. In endeavouring to link function with structure, the anterior cerebral system was linked with disorders of consciousness manifest in delirium and insanity, while disorders in the posterior cerebral system resulted in abnormalities of instincts and appetites, while intelligence was unaffected. These subjects had been more fully covered in Volume 2 of the second edition of Mind and Brain. It is curious that Laycock did not refer to the work of his former student Hughlings Jackson who in 1864 had published clinical studies which showed the importance of the left middle cerebral artery in relation to loss of speech, hemiplegia and epilepsy.(27) As part of a grand synthesis, tissue evolution and degeneration were linked with diathesis.

In diathetic anatomy, diagnosis and therapeutics, the evolutionary law of tissue anatomy upon which I found my clinical view of diathesis is an important guide to pathological enquiries.

Diathesis implied

a special putting together of fundamental elements of the body without regard to organs or viscera except so far as a particular tissue predominates therein.

Laycock's ideas on diathetic anatomy and pathology were idiosyncratic. In 1846 (28) he related that twelve or fourteen years previously the blastoderma had been described as forming two layers of granules. From the outer of these (termed the serous layer) the nervous, osseous, muscular and tegumentary system were developed; next to the yoke the inner layer was termed the mucous layer and from it developed mucous membranes and glands. Between these, or from these, the vascular layer formed and from the two the intestinal and respiratory systems originated. This can be recognised as basically the same as taught later when the terms ectoderm, mesoderm

and endoderm were used. According to Laycock gouty (serous) degenerations affected the heart, arteries and synovial membranes while rheumatic degenerations affected fibrous structures such as the pericardium, aortic and mitral valves. Chronic bronchitis was thought to be a disease of the submucous layer and hence the term "gouty bronchitis" as the serous layer gave rise to bones and joints and the diseases of arthritis including gout. Confusingly Laycock also used the term "arthritic bronchitis". This referred to the wellknown tendency for those with valvular heart disease to develop cough, wheezing and overt signs of bronchitis.

In the mid nineteenth century it was known that rheumatic fevers caused heart disease and the heart valves were affected, but physicians experienced considerable difficulty in sorting out which valves were diseased from the physical signs and the contribution of valvular disease to the overall clinical picture (29).

A physical basis was thus given to hereditary tendencies and diathetic diseases by embryology, an elaborate theory without much support from morbid pathology or clinical medicine. As described in the previous chapter Laycock went further and linked diathesics with physiognomy.

Regression to lower tissue types could be applied to morbid anatomy or chemistry and both involved neurotic change. Gout was quoted as an example; uric acid was a normal waste product in lower animals but when man produced uric acid he suffered from gout. A change affected the trophic nervous system, which operated via its vis nervosa and might be deficient or present in excess and the sensory or motor system might be involved in addition to the trophic. It was recognised that knowledge of the nervous system was very imperfect but some examples in clinical dermatology were given to illustrate neurotic change. If bald headed men were studied it was found that they became bald in the frontal regions or vertex and the baldness ended at a line round the head from the eyebrows anteriorly to the occipital region posteriorly. It was the regional symmetry which was characteristic of trophic nervous system although trophic disease was not always symmetrical. Looking at beards, greyness appeared symmetrically over the lower jaw first while the moustache and upper jaw were spared;

with greyness the protective properties of tissues diminished. Laycock continued taking the law of evolution as a guide, together with the law of use, you will find that the hairs of the head and face follow the evolution and retrocession of the nervous system: men get bald and grey at the top and the temples for the same reason that they decay mentally at the top, and that the animal instincts and appetites survive the memory and intellect.

This dermatological example was not altogether a happy one as it is possible to imagine students inventing ribald stories based on it.

Another piece of evidence frequently mentioned by Laycock was alteration of blood flow in vessels and capillaries which in turn affected nutrition and by this means emotion affected tissues.

In truth with every act of thought and more especially acts of apprehension and emotional attention to any part of the body there is the change in the cephalic centres, such that the circulation within them is changed and therewith the circulation and nutrition of the blood and of organs and tissues to which attention is directed are modified too.

This can be seen as an early ingenious attempt to explain psychosomatic medicine. However it was admitted that arteries and veins were often irregular so that clinical deductions based on them might be in error and this applied especially to the intracerebral vessels. Numerous classes of sensations usually referred to as corporal were in fact trophic. These states of consciousness, hunger, thirst, bodily comfort or discomfort, whether normal or abnormal indicated a special sensorium commune corresponding to that of mental and intellectual function. Addressing the question of the anatomical location of nerve centres which were associated with trophic feelings, Laycock said he fixed them in the medulla, pons and cerebellum and he looked upon the cerebellum as "the reservoir and source of motor or executive vis nervosa and the great sympathetic vasomotor and trophic centre of the body including brains." This view of

the cerebellum which was repeated in the second edition of Mind and Brain would have been accepted as late as 1872 when the writings of Flourens and Rolando on the cerebellum were still standard. Ablation of the cerebral hemispheres in animals resulted in loss of consciousness whereas ablation of the cerebellum resulted in animals behaving as if they were drunk. Laycock therefore considered the cerebral hemispheres as organs of consciousness and the cerebellum as the organ governing motor organisation and strength which it did by giving out vis nervosa. The cerebrum and cerebellum needed to act together and the anatomical basis of this was "processus è cerebello ad testes". This was a term taken from Samuel Solly who reported fibres on the "processus è cerebello ad testes" which could be traced to the optic ganglia.

Using the theory therapeutically it was suggested chemical elements in a fixed evolutionary order produced vital energy which was a primary force. Molecular energy could be supplied by certain chemical compounds or "molecular forces" could be applied in the form of heat, light or galvanism. A general doctrine of energy was becoming increasingly important after 1840 as physical chemistry was established involving heat, electricity and luminescence (30), and using this trend, the treatment of diathetic diseases was essentially vital and chemical. Although the vis nervosa was specially evolved, other tissues were directly related to it and diathetic remedies had to take into account both the nerve tissues and general tissues. For example lactic acid, a morbid product of muscle could be neutralised by potassium, but potassium could be given as a muscle tonic just as phosphorus was a tonic to the brain.

These accounts show Thomas Laycock was a convinced evolutionist who used, in part, reversed evolution to account for pathological lesions. He further developed his idea of neurosis by linking it with diathesis and physiognomy and both were then associated with tissue changes.

Diagnosis for Laycock existed at various levels. Firstly there was the physiognomical which was entirely empirical and based on experience. Secondly the diathetic which was related to embryological development and thirdly the physical diagnosis. On physical diagnosis Laycock commented "Whatever theoretical ideas of

certainty may be excited by its inappropriate name (it) is but another form of experience and has its fallacies also." (31).

Much of Laycock's writing on diathesies and trophises would seem incomprehensible to medical students only some 70 years later, it is therefore appropriate to enquire how it appeared to his contemporaries. The Medical Times and Gazette of 1871 carried a long editorial entitled Professor Laycock's Lectures (32). His view that diseased states of tissues and organs were reversions to a lower evolutionary form of organ or tissue was considered important, a method Laycock had followed long before the popularisation of evolution by Darwin. Extracts from the editorial read:

The doctrines regarding diathetic diseases which Dr Laycock had introduced into the study of medicine differed widely from those current, inasmuch as they are founded upon the evolution of tissues and organs and have therefore a solid basis in histological anatomy instead of merely the course and symptoms of diseases. ... By a consideration of diathetic principles, medicines formerly administered with great doubt can now be administered less doubtfully and diseases uncontrollable by ordinary routine treatment more readily succumb to the influence of diathetic remedies. ...

In his concluding lectures "On a Clinical, Trophic and Vasomotor Anatomy of the Brain and Cord" Dr Laycock guided by the principle of evolution developed a complete system of neurotic trophic anatomy. Such a wide view must necessarily have its weak points and no doubt exceptions may be taken to details; but as a generalisation of great principles and laws applicable to pathology and the diagnosis and treatment of cerebral disease, it cannot fail to be of great value.

Neurology

Advances in the neurophysiology of the spinal reflex and advances in knowledge of cerebral anatomy were two of the important factors in leading Laycock to his reflex function of the brain. The former have been dealt with in Chapter 4 and it therefore remains to consider the advances in neuroanatomy that led Laycock to see the cerebral ganglia as homologous to the spinal and the wide application of neural abnormality to disease.

Dissection of the brain, especially tracing nerve tracks, presented great difficulty and the first advance was the hardening of the brain in alcohol prior to dissection. Attempts were made to describe the interior masses of grey matter both in terms of shape, relations, and colour by Haller 1784, Vicq d'Azyr 1786 and Soemmerring 1788. The Corpus Striatum of Willis was divided into caudate and lentiform nuclei and the latter again divided into the inner paler globus pallidus and the outer putamen although nomenclature was at times confusing. Santorini described the red nucleus and Soemmerring the substantia nigra: the caudate nucleus, fornix and thalamus were recognised and the medulla defined. The base of the brain was more accurately described and Soemmerring correctly identified the twelve cranial nerves (previously thought to be ten because 9, 10, 11 had a common exit from the skull). Gall in his early days gained recognition by his anatomical description of the brain and described fibre tracks by the scraping technique and Vicq d'Azyr named the mammilo-thalamic track.

The cerebral cortex was also receiving recognition, the sulci named and the laminated structure of the cortex recognised. The cerebellum was given a detailed anatomical description (Malacarne 1776) and Vicq d'Azyr also named the dentate nucleus. Microscopy played a part with improved achromatic lenses with the result that nerves were recognised as cells and fibres and not hollow tubes.

Comparative anatomy of the central nervous system was also making progress so that Laycock had some evidence he could quote for thinking of the cerebral ganglia as an extension of the spinal ones and further support for the great "chain of being" hypothesis. In spite of the great gain in neural anatomy its clinical application was slow and difficult.(33)

The first text book devoted to clinical neurology was A Treatise on Nervous Diseases by John Cooke, physician to the London Hospital and published in two volumes in 1820 and 1824. Laycock did not mention this work but he would have known of it. Seventy four introductory pages were devoted to the history of philosophy and knowledge of the brain and its functions. The views of Aristotle, Socrates, Plato, Descartes, Locke, Hume and Barkley were quoted and discussed together with the views of many physicians. Laycock was thus not alone in including philosophy with neurology.

Cooke concluded "the physiology of the nervous system remains involved in impenetrable obscurity" and he therefore turned to diseases of the nervous system which was more suited to their powers of investigation, but here he was limited to apoplexy, palsy and epilepsy as were Hippocrates and Galen.(34)

Certainly known to Laycock was Blumenbach's The Elements of Physiology translated by John Elliotson. In this Gall was praised for his phrenological discoveries and the scope and moral implications of his doctrine.

Blumenbach wrote:

Gall discovered each organ and its faculty either by meeting with individuals very remarkable for the latter, so that he was led to examine their heads; or by noticing a peculiarity of formation in the head which induced him to ascertain their talents and character. Phrenology is calculated to assist parents in the choice of occupation for their children. And it may be of much service in confirming some moral views which good sense indeed ought previously to have

suggested. Humility and benevolence are two leading duties.

If we detect the signs of intellectual deficiency or vice
in our own heads, we learn to think humbly of ourselves; and
being put in possession of true self knowledge, endeavour to
strengthen what is weak and to repress what is too strong. (35)

One medical historian writes (36) "Gall's phrenology stands at the opening period of the recent 'anatomic era' stressing and overstressing the significance of central structures for the genesis and shaping of the neuropsychologic phase in the history of psychiatric thought". Smith (37) writes "The work of F.J.Gall was of enormous contemporary importance because it made popularly available a systematic theory of human personality recognising the integration of mind and body". Laycock himself wrote "Phrenology claims preference over all other systems as a professedly practical science of mind. Starting from its fundamental principle that the brain is the essential organ of the mental powers, it attempts to show in which respects and by what methods the mental nature of man can have developed and his material and moral welfare advanced. In other words, it systematically applies our knowledge of the anatomy, physiology and pathology of the brain to education, legislation, religion, morals, the fine arts and the science and art of medicine." (38). There is no doubt that phrenology played a large part in Laycock's psychophysiology and even pathology; although later discredited, it played part in stimulating general neurophysiology.

Laycock reviewed Romberg's A Manual of the Nervous Diseases of Man (39), a volume which divided diseases into disorders of motor and of sensory function and whether these functions were increased or decreased. Today Romberg's name is associated with Tabes Dorsalis and its loss of muscle and joint sensation. He noticed that such patients kept their eyes on their feet and walking was much more difficult in the dark. Unfortunately Laycock did not appreciate the significance of this report. The volume was given to complicated classification so that tabes dorsalis was considered both as a motor disability and a sensory ataxia.

In the course of time the practical significance of Romberg's writing became apparent to Laycock, but ideas of muscle joint sense were not fully developed.

We are wholly unconscious of this operation of the force of gravity, because we constantly resisted automatically under the influence of external impressions. These are interrupted in locomotor ataxy by a special disease of the sensory nerves, cord and ganglia and the patient thus becomes wholly dependent for the requisite guiding sensation upon the sense of vision, by which many automatic movements are regulated through the corpora quadrigemina. Hence it is, that if he be made to stand with his feet parallel and his eyes shut, he shortly loses his equilibrium and would fall as if he were a statue unless held up. (40)

Laycock involved the trophic nervous system in various conditions of muscular wasting or weakness and used it for linkage with associated pathological findings. He elicited fasciculation on tapping the pectoral muscles of those with pulmonary tuberculosis, but not on tapping muscles of the arm. (41). Carcinomatous muscular dystrophy was recognised in a man with abdominal malignant disease and the trophic nervous system used to account for both the muscle weakness and wasting and oedema in the lower limbs.

The now classical division of weakness or paralysis into upper and lower motor lesions slowly evolved after Laycock's death (42) and the absence of this knowledge is apparent in his neurological papers. Pseudohypotrophic muscular dystrophy was recognised, as was Little's disease (congenital spastic diplegia): the differences resulted from differing nutrition due to trophic nervous action. In his second edition of Principles and Methods of Medical Observation and Research, Laycock also adopted a complex classification of neurological disorders according to differentiation and evolution. Diseases of the nervous system were neuroses which may affect the spine, the cerebrospinal axis or be entirely cerebral. The cerebral or cephalic diseases could be manifest as diseases of the mind and were then termed vesaniae. Other axes of

classification were considered such as according to the site of the pathology or according to its causes. Listed also was a special nosology resulting from abnormal vasomotor action, a subject he had already alluded to and was one of his chief continuing themes. It is evident from the discussion of pulmonary, cardiac and vascular disease that Laycock visualised the nervous system playing a key factor in many diseases. In the opening note of the section on the naming and classification of Diseases of the Nervous System, Laycock wrote of the general teleological property of living matter

The correlative teleological force is termed *vis nervosa*. By means of this *vis nervosa* the nervous system acts on the tissue and organs of the body in general, and on its own constituent elements so that their functional activity and the whole of the vital process are adapted to ends.

(*vis nervosa* was an old term originated by Haller to mean a general nerve function. The *vis nervosa* activated the *vis insita* which resided in muscle.)

Laycock's classes consisted of undergraduates and it was therefore necessary for him, in his lectures, to cover the whole of medicine. In the rest of this chapter certain of Laycock's teaching or writings on the main body symptoms are reviewed.

Cardio vascular system

Periodic or Cheyne Stokes respiration is well known to clinicians. Cheyne described in 1818 (43) a case of cardiac failure with right sided hemiplegia, who before death showed periodic respiration. This was further elaborated by William Stokes in 1854 (44) who described periods of apnoea alternating with violent stertorous respiration in a patient with cardiac failure. A paper by Dr Little in 1868 (45) proposed a theory of this condition involving unequal action and output of the ventricles. The left ventricle initially failed with oxygenated blood accumulating in the lungs, pulmonary veins and left auricle: venous blood thought necessary for respiratory stimulation via the vagus

was not supplied and therefore apnoea resulted. Gradually blood with lesser oxygen content accumulated and the left ventricle again functioned more efficiently, respiration becoming deeper and stronger breathing assisted circulation until the effort became too much for the left ventricle and apnoea again resulted. Laycock produced a small monograph on this subject in 1873 disagreeing with Dr Little (46) as the heart continued to act during Cheyne Stokes respiration and many cases of structural heart diseases were not associated with the periodic respiration. A case was described of hemiplegia and typical Cheyne Stoke respiration in which the heart's action remained normal. A further case of periodic Cheyne Stoke respiration was described which presented with cough, dyspnoea and oedema. There were many signs of pulmonary disease together with irregular heart action, a presystolic murmur at the apex and regurgent murmur at the base. A thorough physical examination was made by Andrew Balfour when a clinical clerk, who gave progress reports until the patient's death some six weeks later. At autopsy pulmonary disease was present, the heart enlarged but the valves reported as competent in spite of showing some disease.

For Laycock periodic respiration was probably a neurosis of the vagus and not dependent upon structural cardiac disease: a lady with cardiac disease and albumenuria was described, who developed dropsy and periodic respiration when falling asleep. Falling asleep modified vagus action as would emotional states and hence influence the heart. Intermittent pulse was also a neurosis in a variety of functional cases of heart disease as well as in those with structural disease. Laycock then went back to his paper on reflex function of the brain and pointed out that he quoted a patient of Sir Charles Bell, who on falling asleep would awaken with a sensation of impending death. Friends sat by, watched over him and noted that as sleep came on breathing became slower and weaker as did the pulse. Laycock clearly saw the possibility of neurological action causing a wide range of normal and abnormal functions when he was a young man and extended these throughout life.

Infectious Conditions

When a physician to the Gate Hemsley Private Asylum Laycock encountered an outbreak of boils which affected both patients and staff, and some time later there was another outbreak seen in his practice (47). The condition could start with a small itchy hard pimple, there might be an ecthymatous condition of the skin and in one child the initial lesion was a single very large vesicle. Sometimes the boils started round a previous boil or a solitary blister, or were associated with a carbuncle and impetigo. Usually the attack lasted two to six weeks.

On the nature of the epidemic Laycock doubted the involvement of sympathies which connected all cellular tissues. It was almost certainly due to a poison in the blood which could come from the atmosphere, food, tainted meat or contagious materials originating in animals and then transferred from person to person. The last was considered the most probable explanation, the condition was contagious but there was no infection through the atmosphere. He stated the same opinion again two years later when he wrote (48)

It may be stated, however that the whole question is closely connected with the mode of specific poisons and with the question whether they originate de novo, and if originating de novo whether they commence in brutes or man.

In the summer of 1856 there were a number of patients at the Royal Infirmary affected with boils following the admission of a patient with pemphigoid impetigo. Unfortunately other patients used the same bath and it was reported crusts from the first patient's body were seen floating on the water; Laycock published a paper on the subject at the end of the year (49) in which he started by recalling that he had previously published on the subject (47) and that it was not genuinely recognised that boils were epidemic and associated with other eruptive diseases.

After describing the various forms of "furuncular" disease from the simple boil and carbuncle to gangrenous stomatitis, details of the first patient and a second one also

with pemphigoid impetigo, with whom great care was paid to cleanliness, were given. Some pages were then devoted to Dr Farr's tables of death from carbuncle and phlegmon (diffuse inflammation of cutaneous tissue) in England and Wales for the years 1848 to 1854. From these it was noted that although deaths from carbuncle increased, those from phlegmon had not. Phlegmon affected chiefly young children (due to low vitality of infant life) while carbuncle deaths occurred in an older age group chiefly above 40 and was more fatal in men than women.

In describing pathological anatomy, anthrax was grouped with boils and carbuncles as the core of the lesion was sloughing cellular tissue with an exudative effusion of sero-purulent material. The sloughing was due to strangulation of blood vessels by the distension of surrounding parts of tissue which were resisting the condition. This however did not explain gangrene of the lips, vulva or scrotum nor the communication of anthrax from cattle to man; these thought Laycock were a specific effect of the "materies morbidi".

He observed that the "materies" of contagious furuncle was communicable from one person to another, from one portion of skin to another on the same person, and that if the communication could be prevented the disease was arrested in a person or family. Precautions to prevent contagion could also prevent these cutaneous diseases spreading in schools, asylums etc.

Laycock recorded he had made a few experiments in inoculation with furunculoid matter and one of his clinical clerks twice inoculated his own forearm with pus taken from the second patient on the ward without effect. The experiments were too few to be conclusive but comparative pathology might help in elucidation of the nature and source of the "materies morbidi" which in some instances was epizootic in origin.

In France, Italy, Poland, Hungary and Russia an epidemic of furunculoid disease attacked quadrupeds, birds, fishes as well as man. It was highly contagious and the saliva, discharges from mucous membranes, serum and blood communicated the "materies morbidi". After describing various instances of communication of disease from animal to animal or from animal to man, Laycock considered these could give

clues for further research. It was noted that the plague of boils which preceded the exodus of the Israelites from Egypt followed a plague in domestic animals. For some of his facts on epizootics Laycock said he was indebted to Virchow's Handbuch der speciellen Pathologie und Therapie.

Gastro-intestinal Disease

The following is an account of Laycock's views on gastro-intestinal disease and is taken from notes made at the time by a student (50).

Gastritis was common in alcoholics and in those who chewed tobacco, clinical symptoms were chronic dyspepsia with possibly vomiting. Pathologically in addition to inflammation of the stomach, adhesions may pass from the stomach to adjacent organs and result in vomiting.

Bulimina or binge eating was sometimes a neurosis but generally caused by dilation of the stomach. There was a note at the end of the page to the effect that if the patient was becoming progressively weaker the abdomen and urine should be examined. It seems Laycock recognised anorexia may follow bulimina and that it was important to exclude diabetes mellitus or abdominal pathology, especially cancer.

Stomach ulcer was characterised by epigastric pain, a feeling of distention after food with occasional vomiting; usually only food but there might be some blood. Haematemesis could complicate stomach ulcer but on the other hand it might be due to purpura or scurvy. Fatal haemorrhage occurred in five to ten per cent of stomach ulcers and was more common in women.

Perforation of the oesophagus might be caused by swallowing corrosive acids. Signs of a perforated oesophagus were haematemesis, difficulty with breathing, pneumothorax or coughing food up rather than vomiting it. The condition was always fatal and students were advised to do nothing. The stomach could also rupture, a condition which occurred mainly in men, and was accompanied with abdominal pain,

vomiting and prostration. Stomach ulcers might perforate, the ulcer usually being on the posterior wall or in the pyloric region. Perforated ulcers occurred in quite young adults and led to peritonitis; the patient was collapsed with a rapid feeble pulse, he would lie with the knees drawn up and an anxious facies. In Laycock's views the physiognomy or facial appearance was important, an appearance recognised by clinicians today. Carcinoma of the stomach was seen in women at the change of life, or rather earlier in men, and it could be hereditary; symptoms were pain, coffee ground vomit, fluid in the abdomen and oedema. In two thirds of patients the liver was involved in a cancerous mass arising from the centre of the stomach. However in some patients there was a complete absence of pain and this was thought to be due to the cancerous mass involving nerves. In early stages diagnosis was not easy but indications were a long history of dyspepsia with a haggard facies. No emphasis was placed on early diagnosis but even if it had, no therapy was available.

There was an interesting section on inflammation of the duodenum and gall bladder disease. The inflammatory disease of the duodenum was thought to spread up the common bile duct to involve the gall bladder or alternatively the bile acids might result in duodenal inflammation. Stones could cause colic with jaundice and respiratory difficulty. The combination of fever, jaundice and vomiting was said to be a bad sign but the possibility of empyaemia of the gall bladder or suppurative cholangitis were not overtly mentioned.

Treatment was considered under each heading and although multiple medicines were suggested especially for bulimia, management was generally sensible. In haematemesis it was recommended that the stomach be given a rest, ice and water only given by mouth and iron was the only medicament suggested. In peritonitis milk and water could be given by mouth together with opium; for carcinoma of the stomach milk, lime water, potted meat and opium were recommended. Tartar emetic was a possible therapy for gall stones, but if the patient was already vomiting it was best to give only water by mouth.

Another of Laycock's students was to write in later life that Laycock was the only man he heard lecture on typhlitis and perityphlitis before appendicitis became fashionable (51). Among the notes in the Laycock collection there are those of a lecture devoted to this subject (52) which started by referring to the anatomy of the right iliac fossa, the caecum and appendix, ascending colon and loops of ilium together with the vessels and fascia of the peritoneum which was thought to be the chief site of inflammation.

If inflammation was limited to the caecum and appendix the case was one of typhlitis, acute and chronic inflammation were common in the region and hardened faeces and foreign bodies were often present near the iliocaecal valve. Frequently the appendix was changed into a dark coloured cord or obliterated at one portion. Pelvic abscess was a recognised complication with spread to the kidney region or the region of the diaphragm and abscesses may perforate other viscera. Many cases of acute gangrenous appendicitis with peritonitis and abscess formation must have been studied at autopsy in the Victorian period and records made.

A reasonable description of acute appendicitis was given with pain and tenderness in the right iliac fossa made worse by movement, pyrexia, vomiting and possibly diarrhoea. An abscess presenting as a tumour in the right iliac fossa was described at length; it seems likely that many might have survived the acute episode with an abscess which could be drained.

Haematology

Laycock's lecture notes contain 30 pages headed Leucocytosis and Leukaemia. Although in places these are disjointed and in note form, they give insight into his ideas on these subjects in the 1860's,(53)

The notes open by defining leukaemia as white blood disease characterised by a large increase in lymph, pale nucleated globules and a great diminution in red blood

cells associated with functional or structural disease of the ductless blood glands. Bronzing of connective tissue possibly due to carbon deposit and melanosis were also thought to be characteristic. This physical sign is difficult to understand as Laycock does not appear to be referring to purpuric signs or the papular rashes which sometimes occur in certain forms of leukaemia. The disease was noted as being for the most part incurable. Affected glands were classified as (i) chylopoietic - ductless glands (lymph glands) of the digestive apparatus from the mouth to the ileum which produced a juice from the blood which mixed with the alimentary acid; (ii) the above glands were associated with (a) the liver which produced a juice necessary for chyliification but which might inhibit it, (b) the spleen which modified in some way the blood sent to it.

Both group of glands reacted and enlarged when fever poisons were introduced into the blood and syphilitic tonsillitis, gastric and enteric fevers and malarial splenitis were given as examples. Three groups of leukaemia were listed, the splenic, the lymphatic and the gastric, the latter being made a group on the grounds that the white cell count increased after meals. Laycock listed the ductless blood glands: the cutaneous, the viseral (pulmonary, mesenteric and uterine lymph glands) vascular (lymph glands round the aorta) and the nervous (the pituitary gland).

Referring to the pigmentation Laycock said it had been observed that persons residing in certain districts developed a dark hue and a Dr Williams had reported a patient who was deficient in red blood corpuscles and who after residing in a malarious district, changed from being comparatively fair to being dark. Various classes of chlorosis were accompanied by pigment deposit and this gave two groups of anaemia, those who were pigmented and those who were not. The anaemias were not clearly differentiated from leukaemia.

Under the heading Pathology, three groups of white cells were noted, small, medium and large, the latter being found in erysipelous parts, poisoned wounds and perhaps puperal fever. Leucocytosis was an increase in the medium and large white cells and occurred in pneumonia and inflammations. White cells did not crenate but they might become flaccid and burst giving out granular material, an observation that

Laycock at one time doubted but had since repeatedly seen. Evidently Laycock did use the microscope himself and not rely entirely on the findings of others. Various authors were quoted as finding that those with a lymphatic temperament had fewer red cells than those with a sanguine temperament and that the blood of the foetus was richer in blood cells than that of the mother. Figures were given for iron concentrations in terms of iron peroxide. Diminished numbers of red blood cells were also observed in hydraemia, scrofula, chlorosis and carcinoma.

Bennett's and Virchow's rival claims to the discovery of leukaemia were described; Laycock always used the terms leukaemia rather than Bennett's leucocythaemia. Unfortunately Bennett thought his original case published in 1845 some few weeks before Virchow's had purulent matter in the blood and he did not propose the name leucocythaemia until 1852 (54). Virchow considered there was no increase in white cells without an increase in fibrin which he thought acted as an irritant to lymph glands. Further he considered leukaemia differed from leucocytosis in that in leukaemia spleen and lymph glands enlarged. In leucocytosis the cells were smaller than in leukaemia and had single nucleii, while leukaemic cells had several nucleii like those of the spleen. Virchow held lymph glands were themselves the source of leucocytes and the spleen and other so called blood organs had an analogous function. Laycock mentioned that the spleen and lymph glands may show waxy or amyloid degeneration, but did not note Virchow's use of iodine and sulphuric acid to produce colour reactions with amyloid. The different types of leucocyte could not be clearly identified until the staining methods of Ehrlich with eosin and haematoxylin came into general use. Laycock did not give any judgement in the Bennett- Virchow dispute, an account of which is given by Parker (55): it might have been difficult for Laycock to be unbiased, as he was certainly no friend of Bennett's.

This lecture is characteristic of Laycock, he could not list signs and symptoms or pathological findings associated with a given disease without attempting unifying theories using odd pieces of information gathered in the course of extensive reading.

Dermatology

Edinburgh played an important part in the establishment of dermatology as a specialty and Percival (56) lists Bennett, Laycock, McLagan, Muirhead, Stevenson Smith and Stewart-Stirling as taking a prominent part in the consolidation of the specialty between 1840 and 1880. During Laycock's time he shared responsibility for the skin ward at the Infirmary with Bennett and Walker; Bennett and to a lesser extent Laycock both made contributions to the subject and in 1866 Laycock produced an eighteen page pamphlet for the benefit of students. This gave brief notes on anatomy, cutaneous information and a survey of primary and secondary skin lesions. The text contained hardly any clinical description and for the most part was a list of names. Percival has commented on this volume

.....Laycock must have devoted some thought to the subject for the result is an original presentation and not a rehash of opinions already expressed by his predecessors. His remarks on terminology are highly perceptive and to the point

Laycock published two papers on cutaneous pigmentation in 1861 (57) and conditions, e.g. syphilis, chlorosis, cancer, pregnancy associated with abnormal pigmentation, in which the nervous system played an important part. He quoted a paper by Lister showing that the pigment cells of the frog skin moved as a result of action in the nervous system. Some fifteen cases were quoted, some being historical and of doubtful validity. One case referred to a Sepoy, one of a rebel force who being taken prisoner was stripped of his uniform and brought for examination. The account reported that he was in such a state of fear that his hair changed from black to white in half an hour. The explanation Laycock thought was living hair like pigment cells in the frog's skin could move as a result of changes in the skin capillaries and nerves.

Scurvy

A paper on land scurvy by Laycock (58) suggested the Irish potato famine of the 1840's also affected Britain. Two cases both seen by Laycock were described; they were men who had ceased to eat potatoes and lived on a diet of bread and water or weak tea with occasionally a little sugar or butter. This, said Laycock, was unnecessary as there was an efficient soup kitchen in York but both lived in squalor and one was infirm. That the disease was due to diet had been confirmed by Dr. Stark who himself developed purpura or scorbutus after living for 32 days on bread and water and then bread, water and a little sugar. The unfortunate doctor died from the experiment. William Baly also investigated scurvy and showed it to be more prevalent in prisons where no potatoes were used.

Oranges and lemons were recognised as beneficial but with the advance of Spring cheaper vegetables, cabbage, turnip tops, rhubarb and watercress would be available. "Nettle beer" had been advertised in a shop window as antiscorbutic and nettletops, when taken young and boiled, could scarcely be distinguished from spinach, a message repeated in the last war. Laycock concluded by adding a note that the last Quarterly Report of the Registrar General had called public attention to the necessity of substituting suitable vegetables for potatoes to prevent scorbutus.

Historical aspects of scurvy have been described by Carpenter (59). That scurvy could occur on land became increasingly recognised in the early nineteenth century, both John Elliotson and George Budd of Kings College, London writing on the subject and considering it due to a dietary deficiency. This however became doubted in the latter part of the century when some thought it a form of chronic ptomaine poisoning due to tainted meat. It was not until the current century that the unity of scurvy was recognised as being due to lack of vitamin C.

Laycock Practices some Surgery

Whilst in York, although primarily a physician, Laycock practiced some surgery. In July 1842 he wrote (60) "What is the result of practice? £118 this half year, but half of it for surgical cases, or rather more." Two published cases described the early use of Stromeyer's subcutaneous tenotomy. He related that he had operated on a case of lateral curvature of the spine by dividing the trapezius and rhomboid muscles (the actual site of division not being described) and the wound healed quite well. The outcome relating to the curvature was not mentioned. In addition to operating on cases of talipies, contracted wrist and elbow muscles by dividing tendons, Laycock said "I have also had two successful squint cases " (61). No details were given and one presumes these were cases of altitudinal squint associated with contractions of the sternomastoid muscle and that both the sternal and clavicular heads were divided. It would be interesting to know the age of the patient, if there was any altitudinal diplopia and if dividing the sternomastoid attachment improved vision and the position of the head.

In a further report (62) Laycock described another case of surgical treatment of lateral curvature of the spine and said the method originated with M. Duerin and had been used by Mr Hunter of Glasgow and Mr Childs of London. Laycock's patient was a 17 year old youth in a poor state of health with severe lateral curvature of the spine. After three months rest Duerin's operation was performed, a bistoury being used cutting about one and half inches of the trapezius and rhomboid muscles on the side of the contraction. The patient recovered and Laycock wrote to M.Duerin describing his operation. The muscles responsible for torticollis and spinal curvature being supplied by special nerves led Laycock to think of these conditions as spinal neuroses. They were pathological conditions activated by trophic nerves.

It is surprising to find Laycock undertaking early work in orthopaedic surgery in addition to his vast number of medical activities although many provincial physicians of the time were in fact general practitioners.

Medicine and surgery were to change greatly in the next half century, but at the time of writing Laycock's practice can only be seen as orthodox.

Laycock as a Clinician

Ex students in their later life were to describe Laycock. Macleod (63) said he was at his best in a hospital or asylum, talking to his patients and teaching his students, although he was prone to theory and speculation. He was strong on physiognomical diagnoses and would venture opinions before the full history was taken and a thorough examination made; he was often right but sometimes wrong. His mode of approach has been contrasted with that of John Hughes Bennett who alternated with Laycock in having for six months charge of certain medical wards. With Bennett the physical examination and special tests were paramount and until these were completed no opinion was justified. Laycock could take the history and make a full examination although he was prone, as many physicians are in their own practices, to take short cuts. Another old student (64) related that Laycock taught his students to estimate a patient's temperature by using their hand before the thermometer, a practice of many of the older physicians of the day. On one occasion when he thought a patient had a fever of about 102 and the thermometer indicated a normal temperature, he announced "Gentlemen I must have a thermal anaesthesia this morning". Laycock could take a joke against himself.

Laycock's clinical methods altered during his lifetime as did those of other practitioners. In 1847 he addressed a class of students thus

Yesterday we visited some patients of the dispensary sick with the fever now epidemic throughout the United Kingdom. There has never been so much fever in York. For the first time in the history of the City a fever hospital has been established. The

superintendent of that hospital died from an attack. We visited his widow yesterday who was convalescent from the fever but deplorably weak. By her side in the same bed was her son, a youth of seventeen. His head was bound round with a handkerchief in the vain hope of alleviating the severe frontal headache from which he was suffering. His eyes were turgid and reddish: his skin covered with stigmata or small red spots resembling flea bites, his tongue was coated with ragged whitey-brown fur and his teeth with sordes. On examining his throat (of which he complained of being sore) we found the pharynx and fauces red and his tonsils slightly enlarged: his pulse was 115 to 120.

Our attention was next directed to his sister aged twelve years (65).

In these cases and others the physical examination was largely limited to visual inspection.

By 1875 the clinical methods had vastly changed as evidenced by two cases of diabetes insipidus which Laycock published. The physical examination included auscultation of the respiratory and cardiovascular systems, the abdomen was palpated and any abnormalities seen on inspection noted. The ophthalmoscope was used, optic atrophy found but the visual fields were not examined. Absence of sugar and albumen was recorded as well as the specific gravity of the urine and the microscopic appearance of the urinary deposit (66). No doubt it would have been difficult for a professor of medicine at Edinburgh not to have been up to date in his clinical practice.

Laycock and Bennett

An important rival for the Chair in the Practice of Physic at Edinburgh was John Hughes Bennett, Professor of the Institutes of Medicine. His Chair was mainly concerned with physiology but as a clinical subject and not purely a laboratory one. As

previously described Bennett and Laycock had a complicated and often controversial scheme of rotation for taking charge of the medical teaching wards so that each had a summer session and a winter session of duties. Bennett had a great reputation for early diagnosis and thoroughness (67) and was the author of a volume on the subject (68). Ward records of patients under the care of both Laycock and Bennett extending over many years still exist in the Medical Archives department of the University of Edinburgh. These were written by clinical clerks probably under the direction of resident medical officers, and inspection of some of these shows Bennett's notes to have greater detail of physical examination with the use of a sphygmograph and clinical diagrams illustrating areas of dullness to percussion. In spite of the odd reference to diathesis the notes on Laycock's patients are adequate and conventional and in practice the impact of Laycock's ideas on physiognomy and diathesis seem minimal.

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CHAPTER 10

THE LAST DECADE (1866-1876) AND UNFINISHED WORK

Much was to happen to Thomas Laycock in the last ten years of his life but although we know of his official engagements and publications, there is no Journal, as in his early professional life, to tell of his feelings and how every day events were seen through his eyes. His personal life has been described in chapter three, so this chapter will review some works published and unpublished. He continued writing but in the same vein as of earlier years, attempting to reconcile new scientific knowledge with older beliefs and customs.

New Thoughts in physiology

The mind brain problem continued to be Laycock's chief interest in his final years, together with his ideas on the nervous system and he brought these up to date in a series of papers entitled "Contributions to a *New Chapter in Physiology and Pathology of the Nervous System*" published in the British Medical Journal in the year 1868 (1). The need for a new chapter was stressed as it was "a fundamental fact" that every change in mind or consciousness was associated with a change in the constitution of the brain tissue and his new chapter dealt with chemical laws as a force in immediate relation to mind and consciousness. By this time the embryonic subject of physiological chemistry was developing. Wöhler had broken the division between organic and inorganic chemistry in 1828 by synthesising urea, but for a while biochemistry was held back by technical difficulties (2). By 1868 Kuhne's Lehrbuch der physiologischen chemie had been published and at about the same time lecithin and other substances containing nitrogen and phosphorous were isolated from the brain (3).

The nervous system in general said Laycock exerted a powerful influence on some chemical changes in the body as in muscular action and on the processes of nutrition of its own centres. This was effected by changes in the nutrient fluids, blood, chyle and lymph and in the chemical changes they underwent. In the new chapter there was a place for the trophic nervous system which was distinct anatomically and separate from mental and emotional activity and reflex movements.

In my proposed new chapter I have a place for a trophical nervous system anatomically distinct from those portions appropriated to mental activity and emotional and reflex movements with its own afferent and efferent nerves, its own commissures and ganglia and its own volitional, emotional and reflex phenomena.

The chemical changes in all living organisms and tissues themselves adapted to ends and therefore, for Laycock, obeyed the fundamental law of teleology. As in previous papers physical and vital forces were linked with mind and the nutrition of tissues and the importance of clinical observation stressed. The observer had to know how and what to observe, and this knowledge was only to be found in general principles. Headaches were cited as an example of unsatisfactory and disconnected observations; a report on the subject of 1787 classified headaches in four sections with sixtyfour varieties, yet it was useless for practical purposes because it lacked "the harmonising power of verifying principles such as modern anatomy and physiology would supply". Quoting evidence that in vivisection experiments, irritation of the brain or its meninges did not appear to cause pain, Laycock noted it had been suggested by some that two types of pain existed, corporal pain and metaphysical pain which could not be caused by brain injury or irritations. He did not agree, the apparent difference was entirely due to different causes; mental pain was brain pain which could not be excited by physical means.

The same chaotic state existed in therapeutics where arsenic and alcohol were considered as examples. Laycock often wrote and spoke on the use of alcohol, but in

the paper under consideration he noted that very little was known about its actions on nervous tissues in general and on the brain in particular. It might help in restoring health and relieving delirium and weakness of mind, yet under other circumstances could be destructive to bodily and mental health. Laycock remarked that he had found brandy, in quickly repeated half ounce doses, could arrest a pulmonary haemorrhage even when death appeared imminent, a finding he could not explain.

In relation to Epilepsy Laycock thought it begged the question to distinguish between chronic epilepsy (epilepsy in ill subjects) and essential epilepsy, even if in towns most cases occurred in those with anaemia and weakness, rather than in those with excitement and plethora. An observation by Schroder van der Kolk was quoted in which a 19 year old male subject with infrequent epilepsy was found to have the "heat" of the head asymmetrical in distribution, the "heat" of one cheek to exceed that of the other by thirteen degrees some fifteen minutes before an attack (although this case was from a translation it is surprising the word heat rather than temperature was used without comment).

A detailed examination of the physiological ways in which the nervous system influences its own tissues and other tissues and organs followed. This was an enlargement of earlier concepts of the nervous system affecting tissue pathology and described in Chapter 8. Firstly the influence of the mind on the body operated from cephalic centres serving thought and feeling acting on other centres which influenced tissues and organs. Secondly the influence of the body on mind was due to the reverse process. Thirdly sympathies of organs was due to nerves from the organs acting through centres (unspecified) on other centres. Fourthly motor centres acted directly upon motor structures whether voluntary, involuntary or vasomotor, and fifthly the system of motor centres regulated the secretion, nutrition and temperature of tissues and "those fundamental processes included under the term *enemacausis* in which chemical affinity played so important a part." Laycock never attempted a diagrammatic description of the conception of the various parts of the nervous system.

The second paper on "The Theories of Nervous Influence on Nutrition and Function", goes into some medical history before Laycock discussed his own views. In the Renaissance period, a certain "learned lady named Oliva Sambucts" looked upon the body of man as a tree having its roots in the brain where a juice was taken up and spread throughout the body for purposes of sensation, emotion and nutrition, an illustration borrowed from Haller. The juice became animal spirits and later some thought of the animal spirit in terms of electricity or Galvanism. Laycock said in these speculations the blood had been overlooked and he referred to a then current issue on the value of bleeding. Some mathematical physicians considered the velocity of blood flow significant but the findings of one Hewson were important; he discovered a change in fibre content of the blood on bleeding which was independent of velocity and attributable to action of the nervous system, a finding suitable to Laycock's way of thinking.

The fibre had been thought of as a basic structure since Erasistratus, and was later a functional element of organisms and their cells. John Hunter had made it the "actual stuff of life". Virchow by chemical analysis showed that fibrin was a polypeptide whose presence in blood was only found on coagulation. He suggested most of the fibrin was present as fibrinogen in the body and required oxygen or some other substance to activate it (4). Stahl, his followers, and in a modified way Whytt, held sympathies to be due to the action of the brain in the 'sensorium commune', the seat of the 'anima'; sensation, and consciousness were held to be identical with the anima. Unzer, in Laycock's view the founder of modern mental science, maintained that sympathies were due to changes in the nerves and nerve centres and used the term reflex action to explain this theory. Marshall Hall used a modified form of Stahlism when he used the term vis nervosa in place of anima. The discoveries of Galvani and the then recent researches into heat, electricity and magnetism led the physicists to a theory of correlation of forces; Laycock considered this also brought them into a closer relationship with the vis nervosa and vital forces. Even at the time of writing, he thought the new school of physics rather mathematical and philosophical, a process

which was to continue. The bodily and mental changes due to alterations in the brain were held to be responsible for the mental and bodily states induced by mesmerism, spiritualism and the like, which were often termed mysteries because so little was known. Reichenbach had postulated the odyllic force (described in Chapter 4) and this had been taken up by the late Professor Gregory. However Laycock thought their labour might have some beneficial effect on neurology and psychology in the way that alchemy had in leading to chemistry. He then again summarised the cases of the O'Key sisters and his own writings on hysteria and reflex function of the brain. Others ascribed to consciousness or the will actions deemed reflex by Laycock. He recalled his views made little progress until 1851 when there was a further wave of mesmeric activity and he then digressed to say he was prepared for his comprehensive method of inquiry into mesmerism and hysteria by his Galvanic scheme. He recorded:

When I was a student (1833-4) the question of oceanic steam navigation was warmly discussed and its practicability doubted:and I speculated upon the possibility of some other force for that termed heat as a motive power. To this end, I had gone over what have been more recently termed the correlations of heat, magnetism, electricity and chemical affinity; and had arrived at a hypothetical source of motor force and at a notion of a mechanism appropriate there to.

Other doctrines with an occult basis were homeopathy and heroic treatment by copious blood letting and much drugging. Laycock recounted that in 1846 Sir John Forbes, editor of the British and Foreign Medical Review, advocated a reformed school of 'Young Physic' and he invited contributions on the Natural History and Treatment of Diseases. Although most views expressed then were accepted by 1868 the storm of indignation on the subject of homeopathy was such that Sir John had to retire from the editorial chair. Laycock was proud to have been among the first to contribute, and looking back there was little he would wish to change.

The principles he had laid down were:

1. Physiology and histology both normal and abnormal must be the basis of classification: pathological anatomy should be based on observation of tissues, but diathetic anatomy which concerned the order of change in tissues and organs had to have regard to those tissues and organs embryologically.
2. The order of symptoms must be observed in relation to time. Under this heading Laycock's views on proleptics were again advanced.
3. The influence of the nervous system must be given greater consideration.

Laycock then turned to discuss the *vis nervosa* in the light of the then current scientific knowledge. The changing face of medicine was recognised, the modern physician had to be a chemist, mathematician and metaphysician as well as a practitioner, but as he, (Laycock), was not competent for such a task, he was only going to consider them in relation to better clinical observation and practice. Chemistry and physics had developed greatly in the mid Victorian period and Laycock endeavoured to integrate this new knowledge with older medical views. From physics it was known that matter had no power of motion in itself, a force had to act upon it and when such a force was applied, resistance or inertia was found. All this was an expression of experience of motion based on ourselves and depended on muscular energy as a cause of motion. This was appreciated by philosophers as described in Chapter 7. Further muscular energy could produce heat, light, electricity and consequently regulated the attraction of particles attributed to chemical affinity. Laycock endeavoured to unite advances in chemistry and physics with former physiological ideas of *vis insita* and *vis nervosa* described by Haller.

If this was accepted it was essential to know how nutrition and vital force differed in relation to the kinds of matter of which living tissues were constituted. At the time of writing there appeared to be some sixty elementary bodies or elements of which at least fourteen entered into the composition of blood and tissues of the human body. The molecules or atoms underwent movements in a series of combinations; oxygen, iron,

sulphur and phosphorous were of this class. There was an ascending series of combinations in organic matter that constituted the various cells and nerves of the body. "The highest evolution of chemical affinity was an arranging force in brain tissue that was in immediate relation with consciousness, and its fundamental fact the Ego or I." Thus the solution of the most fundamental questions in life, organisation and mind depended upon a knowledge of the complex laws of atoms in motion and their combinations, and the organisation of matter consistent with the law of design. The results of chemical energy were designated 'diáthêsis' from diatithemi, (I arrange), although the word was commonly used in Pathology and pronounced 'diathesis' to mean a particular arrangement in an individual to constitute a tendency to disease. No knowledge existed of the exact chemical reactions for vital action, knowledge which was to slowly emerge in small pieces over the succeeding generations. It was noted that chemical changes in alkaloids by combining them with methyl iodide or sulphate vastly changed the toxicity of drugs. Toxicity also depended on the state of the tissue or organ being acted upon and here a personal note was added. When Laycock was suffering much pain and exhaustion (doubtless after amputation of his leg) he took a dose of tincture of aconite which did not exceed one minim yet it so modified his brain tissue and perceptions "that the scream and rattle of a midnight railway train was transformed into the grandest aërial music pealing amidst landscapes of surpassing beauty". The dose was so small that Laycock said if he had been in normal health and his brain tissue in a normal state of nutrition no effect would have been felt. One suspects that he was suffering a period of delirium.

Finally Laycock considered the effects on the nervous system of unnatural and excessive sexual feelings in both sexes. This subject was popular at the time when masturbation was thought to lead to insanity but the paper comes in some ways surprisingly close to Freudian sexual neurosis. Laycock regretted that behaviour related to the lowest of the great range of human instincts was wholly in the hands of a class of the most degraded and vicious of men. Of sexual instincts and their control he wrote:

To those who are deeply imbued, naturally or by education

with the spiritual element, the primary corporal instinct for sexual union which runs like a thread through their highest aspiration thus evolved is a never-ending trouble and many are their efforts to subdue it. But it is an inevitable ingredient of life, since without it, the race of man would perish from the earth.

One wonders how much of this was Thomas Laycock's personal experience. He continued by observing unnatural and excessive excitement whether of mind or body resulted in diseases of a very varied character because there was no portion of the nervous system which could not be pathologically influenced. Little had been done by orthodox medical men for instinctive human sexual behaviour and the treatment of neuroses resulting from excitement of the sexual organs.

It is obvious from these considerations that the class of sexual neurosis in both sexes must be considered as a whole, both in reference to the causes and the seat and under the guidance of more exact general principles. And in the first place it is plain that the consequences of sexual excitement differ according to the cerebro mental or cerebro-spinal centres involved, and according to the state of erethism or asthenia.

It is generally believed that neuroses resulting from venereal excess are of a depressing nature.

A common form of neurosis was erotic irritability of temper and a case was quoted of a gentleman patient who consulted Thomas Laycock on account of an uncontrollable temper which caused suffering to him and those about him. This occurred under two circumstances; when he worked long at his books, or after conjugal intercourse.

Discussion with friends on the effects of masturbation led Laycock to the conclusion that in certain cases there was a relationship with homicidal and other aggressive instincts. Masturbation had been considered to be a cause of insanity

especially since the time of Esquirol and was commonly accepted as such in the Victoria era. Women often experienced a morbid irritability of temper with menstruation which Laycock considered possibly a sexual neurosis. A further patient was then described linking a sexual neurosis with pathological jealousy. A certain clergyman felt an indifference to, and an unfounded jealousy of his wife, although he had no doubt about her affection and fidelity. Again his indifference and jealousy were most marked after hard mental work or conjugal intercourse and Laycock adds:

To this class belong also those distressing cases in which after a marriage of affection and in all respects happy, irreconcilable incompatibilities of temper arise.

Another type of sexual neurosis could occur in a strictly moral youth who was studying hard and experienced nocturnal seminal emissions. He would consult a sympathetic quack who acted upon his imagination increasing the subject's "nervousness". If he was engaged to be married he would doubt his sexual fitness and the quack would not abandon him until he had extracted all his cash.

Because all theories on mind and consciousness had laws of chemical affinity as a common basis, some practical conclusions were possible. These were:

1. Although phosphorous was an essential constituent of brain and nerve tissue it was equally important in other tissues so that medicinal phosphor compounds prescribed for defects in the nervous system would be equally useful in certain other diseases and defects. In wasting diseases the urine was heavily loaded with phosphates and giving phosphates would help general nutrition.
2. Other constituents of living tissue were as necessary for health as phosphorous or sulphur. Such were the non metallic substances chlorine, iodine and bromine and the metallic substances iron, calcium, potassium and magnesium. They were important both pathologically and therapeutically as "flesh formers" and "heat producers".
3. For the physician the results of chemical affinity have not only to relate with motion (kinesis) but orderly arrangement (diathesis); these operated according to the law of evolution and differentiation in both inorganic and organic chemical compounds.

Many obscure functional disorders of brain and mind were thought to be due to local abnormal temperature of brain tissue.

4. The laws of evolution embraced the evolution of organs and tissues together with the evolution of mental states such as instincts, passions, intelligence and those feelings associated with sex and reproduction . The latter were associated with the sexual neurosis and anatomical and evolutionary aspects of sex were the cause of sexual differences in neurosis and somatic disease, thus tabes dorsalis was rare in women; a finding repeatedly substantiated. One aspect of sexual neurosis to which attention was not drawn, although it might have been expected from Laycock, was that the process could be unconscious; this was emphasised by Freud. From these papers it was evident that Laycock was conversant with the scientific developments of his time and wrote at length endeavouring to unite them with his long established beliefs relating to neural function.

Can the Body and Mind Relationship be Investigated?

A section of Psychology in the British Medical Association was formed in 1870 with Thomas Laycock as President. An entry in the minute book following a meeting at Birmingham in 1869 (5) reads "A communication was made by the President from Dr Laycock requesting the Committee of Council to consider the propriety of appointing a Psychological Section at the next Annual Meeting" and

Resolved "That at the next Annual Meeting a Psychological Section be established and that the President of Council be requested to communicate this resolution to Dr Laycock".

The next Annual Meeting was at Newcastle on Tyne and the subject Laycock chose for his presidential address to the Section of Psychology was "How far can the relation of body and mind be investigated scientifically and practically?" (6).

It was claimed the acceptance of the popular doctrine that the soul existed under certain circumstances independently of the body, led to spiritualism with all its follies, but if anyone advocated the soul and brain were one, they were charged with materialism. This was not so as Laycock contended the scriptures taught that life and soul were inseparable. St Athanasius was quoted when he wrote "For as the reasonable soul and flesh is one man so God and man is one Christ."

Next Laycock turned to the method of investigation of body and mind and said it was necessary to classify mental phenomena; this had to some extent been done by philosophical schools but they should be all of one class, and for Laycock mental phenomena were due to variations of consciousness. The feeling of bodily pain involved the soul (or mind) of man as much as his loftiest thoughts.

There were three classes of phenomena with three causes or forces, the psychical or mental, the vital and the physical. The highest form of consciousness and of the psychical force in humans was the ability to reason, and the use of intelligence to obtain the necessary end for adaptation. Yet all living organisms show some powers of adaptation even if there is no consciousness and no ability to reason. Further physical energy for which molecular changes were necessary were required for all classes of phenomena including the mental. The researches of a Dr Houghton were quoted as showing that five hours of cerebral activity were equivalent to about ten hours of muscular activity and this led to the question how did cerebral activity differ from the physical? Although the brain was entirely physical and depended upon molecular action, the cardinal point was that the energies were adapted to ends. Many physicists disregarded the argument of adaptability because of its links with teleology, and declared the relationship of mind and body a mystery, but for Laycock mystery was synonymous with ignorance. The body-mind problem was no more mysterious than the inseparable union of matter and gravity. This might appear simple to physicists but it was then only two centuries ago that the philosopher Leibniz remarked:

I am a great friend of experimental philosophy; but Newton

deviates much from it when he pretends that all matter is heavy and that each particle attracts every other particle.

Gravity, maintained Laycock "was co-extensive with adaptivity" and Laplace was quoted as showing by calculations involving calculus that the the likelihood of the motions of planets being due to an intelligent first cause was above four million to one. Laycock's reading must have been extensive to embrace the use of calculus in probability theory.

Since energy in the form of molecular motion was common to all classes of phenomena, a law was designed:

that adaptivity is more and more manifested and potential energy or tension increased as living organisms are evolved in form being least in the lowest and greatest in the highest.

Potential energy or tension increased with molecular weight and an example was given whereby one molecule of water added to apomorphia, an emetic, was changed to morphia and at the same time entirely changed in pharmacological properties. B.W.Richardson experimented with organic nitrites and was quoted thus:

These agents against our wills act through precisely the same means and in precisely the same manner as do the more refined influences which daily excite in us what we call emotions.

Laycock said an act which shall call forth a blush or the pallor of terror also calls forth involuntary secretion which makes the heart beat with an intensity which could be painfully felt. Any and all of these acts which would be called psychical have their precise analogues in the actions of the organic nitrites. At the time of writing one of Laycock's former students, Thomas Lauder Brunton, was working in Carl Ludwig's department on the effects of amyl nitrite on capillaries and blood vessels. This compound was later to be used extensively in the treatment of angina of effort but its effect of causing blushing of the face would have been known previously.

In conclusion Laycock considered there existed a vast sphere in which psychology could be brought into biology but it would require another

generation for a profound change in the science which dealt with human nature to be seen. Through psychology, education, morality, public health and all questions included under social and political economy would be influenced.

This is perhaps one of Laycock's more significant papers foreshadowing neuropsychology and psychopharmacology and perhaps sociobiology. The British Medical Journal of September 1870 carried an editorial on "The Credentials of Psychology" welcoming the newest section of the Association and passing the following comments.

Many must have regretted that they had not been able to study psychology along with medicine, surgery and midwifery and the fact that the British Medical Association recognised psychology ought to compel recognition of the subject by Examining Boards of Universities and Colleges.

The subject dealt with the human mind and ranged from metaphysics on one hand to the molecular changes in the brain parallel with thought on the other. In addition to this there was medical psychology. The editorial recorded that a recent French writer (M.Th.Ribot) had divided English psychology into two 'schools' - the thinking and experimental; the former including Hamilton, Ferrier and Whewell and the latter J.S.Mill, Spencer Bain, Lewes and Morell who mixed more natural science with their thinking. (The Ferrier referred to was J.F.Ferrier, Professor of Moral Philosophy at the University of St.Andrews). As the editorial commented, it was odd that Laycock and Maudsley were not included among the experimental school as the experimental psychologists named by M.Ribot were unacquainted with the experiments of nature which were manifest in insanity.

The difficulties of studying psychology (human nature) which included symptoms such as pain, grief, melancholy and the endless discussions of thinking psychologists were considered; thinkers only would never have arrived at the findings of experimental scientists. After mentioning one of Laycock's ideas, force as an

adapting energy, the article concluded by agreeing that mind and body were not too mysterious for investigation and could be brought into the field of experimental research.

Laycock and Carpenter Again

The difference of opinion with Carpenter was to be the subject of Laycock's last published paper and was occasioned by that extraordinary character W.W.Ireland in an essay entitled "Can unconscious cerebration be proved?" (7) . Ireland was a descendant on his mother's side from John Knox; he was severely wounded in India, a bullet entering his eye and leaving behind his ear. Because of the severity of his injury, he was granted a special pension, spent his time in travel, studying history and languages and is remembered for his studies of illness in important historical persons. He had an impressive personality, became physician superintendent of the Larbert Institution and well known for his oft repeated statement "every cretin is an idiot but every idiot is not an cretin". Ireland stated that 'Unconscious cerebration' derived no support from physiology and wrote:

Unconscious cerebration is regarded as so important a discovery that two well known scientific men have contended for the priority of its publication.

In reply (8) Laycock had no doubt the two people referred to were Carpenter and himself and he thought it right to disclaim any relationship with unconscious cerebration as this was Dr. Carpenter's phrase with which he disagreed. Dr Carpenter used the term cerebrum to mean the convolutions of the cerebral hemispheres whereas anatomists included the cura cerebri, pineal gland and internal ganglionic masses. The word cerebration was used first by Engledue,(friend of Elliotson,) in 1842 when addressing the Phrenological Association who claimed there was no such thing as mind.

William Carpenter had, in Laycock's opinion, honestly endeavoured on various occasions to indicate their respective share in describing brain reflexes. Nevertheless there were fundamental differences between them in spite of their both being led to reflex function of the brain by investigation of mesmerism; Carpenter in 1851 but Laycock in 1837-8. These differences were listed by Laycock who claimed Carpenter was wedded to the old school of metaphysics and too superficial when considering Laycock's own views. Much of Laycock's discussion was itself metaphysical and he thought some would object to his views as teleological but as all life was a series of adaptations, it followed that there was an end attained by the mechanism although no end may be purposed by it.

On the subject of the will and attention, Laycock stated he originally held nearly the same views as Carpenter, but he had now abandoned them as a more correct generalisation could be made. He then cited some of the newer neuroanatomical knowledge; the grey matter of the cerebral convolutions was made up of layers of cells and Laycock thought it probable that each layer had distinct functions in connection with corresponding layers of the corpus callosum. Perception, attention and ideation both in healthy and disordered brain states, showed them to be distinct and have their own mechanism which were related to the layers of the cortical convolutions. This was an up-to-date view of cerebral neurology at the time and in part has proved to be correct. At the end of this his last paper, Laycock asked two questions when talking of pain and pleasure, desires and emotions. Firstly can consciousness be a cause of such conditions? Secondly can cerebral reflex action be proved by direct observation and experiment if a physiological definition of consciousness is taken? This approach was recognised as difficult because no one but the individual concerned could say whether, when he did any particular act at a particular time, he was in any state of consciousness. Laycock gave a relevant case history: a certain man consulted him on account of urinary troubles. Mr. Syme sounded the patient and reported there was no bladder stone, so it was assumed that pains were due to renal colic. After two years

the patient demented and when visiting him Laycock saw him crying out in paroxysms of pain but two minutes after the attack he denied ever suffering pain.

This history seemed to show a man could suffer pain and not know it. Laycock considered such an idea would normally be erroneous and he then indicated that memory is a component of perception and his patient lacked memory; a view which would be taken today. The mistake Laycock thought was to have two methods of solving the problem, that of self examination or introspection and the concept which sees all states of consciousness as a result of brain activity. Further if the truths of science and theology cannot differ, could this be the expected result if the methods of investigation differed? The solution was to combine the two methods and Laycock thought it was for the theologian to investigate according to the scientific method or to examine and verify the investigations of others.

A recently found file at the Royal College of Physicians at Edinburgh contains a correspondence on Laycock's claim to priority in the reflex function of the brain (9).

In June 1855 Laycock wrote to Sir John Forbes, a mutual friend of himself and Carpenter about a matter which he said concerned them both. Eleven years previously he (Laycock) had written a paper "On the Reflex Functions of the Brain" drawing attention to some functional activities of the brain being independent of consciousness and the will, which was ignored by Carpenter until 1853 when Laycock's views were adopted in the phrases "ideomotor" and "unconscious cerebration" in Carpenter's Human Physiology 4th Edition. Laycock felt strongly on this subject as "this was not the mere discovery of a nerve fibril or a new species of organisation, but a great principle destined to be the basis of an entirely new system of mental philosophy". Sir John was asked to look at the 5th Edition of Carpenter's work and see how Laycock's ideas were used. Carpenter also ignored Laycock's views in a review article, but Laycock passed this over the essay being anonymous. He did not think he could do anything except at the risk of losing Carpenter's friendship and that would grieve him deeply. Laycock also wrote to Noble on the same subject. Sir John replied to Laycock, and must also have

written to Carpenter who put put his views to Laycock. He (Carpenter) said he was sorry to learn from Forbes and Noble that Laycock was aggrieved by his want of recognition. Initially Carpenter followed the views of Alison that there was a class of reflex actions which involved sensation and described these as excitomotor and sensory/motor. Gradually he came to recognise "the dominant force of ideas as a motor power quite independent of the will" and realised his ideomotor were Laycock's reflex actions of the brain. At the same time Carpenter could not say when the idea occurred to him that cerebral changes could take place without consciousness; he was certain this did not result from reading anything of Laycock's but from previous ideas relating to the sensory centres. (This was incompatible with the concept of the cerebrum being itself the seat of consciousness). In fact the only thing they had in common was that reflexes could act by the cerebrum. It was later still that Carpenter learned Laycock claimed priority in the idea of "unconscious cerebration" for if he had that idea, he had never expressed it.

In a further letter Carpenter reported that when he edited his last edition of Human Physiology he certainly thought the application of cerebral reflexes to insanity, dreams, delirium, somnambulism, hypnotism and electrobiology was original to himself, but having reread Laycock's work, he now agreed with Laycock's priority. Things would certainly be remedied in the next edition and he thought they would be better friends for being able to speak their minds to each other.

However five years later Laycock went over this old ground in an appendix to Volume 2 of Mind and Brian, but eventually Laycock and Carpenter came to an amicable relationship. The appendix was omitted in the second edition of Volume 2 of Mind and Brian and Carpenter later wrote:

The extension of the doctrine of reflex action to the brain was first advocated by Dr Laycock in a very important essay read before the British Association in 1844 and published in The British and Foreign Medical Review in January 1845. Subsequently to the first publication of his views (in the 4th

Ed. of his Human Physiology 1852) the author learned from his friend Dr Laycock, to whose essay on the "Reflex Function of the Brain" he has already referred to as a most important contribution to mental physiology, that he intended to convey the idea that such reflex action might be unconscious. As no distinct statement was made to that effect, and as Dr. Laycock's illustrative examples were all of a kind in which consciousness was involved, the writer may be excused for having, in common with others who were following the same line of enquiry, failed to apprehend Dr Laycock's meaning on the point. But he willingly accepts Dr Laycock's statement of it and now restates the grounds on which he himself independently arrived at the same conclusions. (10).

Some Unpublished Works.

The Laycock Collection at the Royal College of Physicians Edinburgh contains among written manuscripts, articles or pieces from newspapers or journals groups of undated manuscript material which appear to be preparatory material for books which were intended for publication but never finished.

The first is for a presumably revised edition of his book on Nervous Diseases of Women.(11) The subject matter was dealt with under the following headings and are somewhat different from the 1840 edition.

Part I. General Pathology of nervous disease of women.

Part II. Menstruation and periodicity in relation to ovarian influence.

Part III. Physiological and pathological relations of the reproductions to feminine neurology.

From the heading of II it is evident that the ovaries were accepted as having some influence on the hysteresis of the menstrual cycle although it is doubtful if there was a significant appreciation of a hormone influence in spite of Claude Bernard's description of "le Milieu Interieur" and the work of Brown Sequard on adrenal extracts in relation to Addison's disease, both men known to Laycock.

A further group of papers are evidently intended for "A Treatise on the Organic Laws of Thought in their practical relation to Education and Training". This work arose from two lectures delivered at the Educational Institute of Scotland at the end of 1874. On page 1 Laycock listed his blackboard notes (12).

These were:

Force and Energy

Force = cause of motion. Is measured by space traversed in time.

Examples - force of a gale of wind in miles per hour.

Red rays of light strike the eye at the rate of 4-5 billions of undulations in a second of time.

Energy = cause of motion measured by weight moved through space - example One pound weight lifted one foot = foot pound measure of energy.

All this was in accord with physics and mechanics of the time.

Memory

Synesis = memory as organic record = the union of body and soul in perception of Plato.

An act of learning included:

1. *Attention proper = the muscular and nerve acts.*
2. *Perception = brain process whereby - I take in the outer, as outer, through sense.*
3. *Conception = brain process whereby - - combine the outer with the inner through knowledge.*
4. *Memory. = available record of thought and knowledge*
 1. *Synesis = organic record as defined*

2. *organic reproductivity.*

(a) *As reminiscence = to recover the organic record with consciousness of past time.*

(b) *As reproduction with reversion to organic record without consciousness of past time.*

Force and energy had been given exact definitions, could be measured and Laycock attempted to transfer these terms to psychology and neurophysiology, although it was difficult to do so with any accuracy. He opened by remarking a knowledge of the brain could be of possible advantage to teachers. If they were thoroughly acquainted with applied psychology they would take care to always make a clear and distinct impression on the minds of pupils, and never urge boys or girls to give attention to lessons when they showed symptoms of weariness and drowsiness. The necessity of good ventilation in classrooms was stressed and the greater the work done by the brain the greater was the need for fresh air. It was also highly desirable that teachers should study children not only for their capabilities but also their capacity of knowing good from evil or the abilities of a boy or girl to resist a desire to do evil. In this Laycock closely followed John Locke's thoughts on education. He then addressed the problem of corporal punishment and reminded his audience that children were liable to shocks which might prove fatal when subject to excessive bodily pain, and there were other forms of punishment which may be more suitable. Next Laycock spoke of a then current proposal to lash wife beaters, remarking that flogging was a form of torture inflicted by barbarians and although wife beaters were little better than barbarians, he feared flogging might increase hatred and anger and thereby increasing the probability of murdering or deserting the wives. No alternative method of retribution or deterrence was suggested.

On the subject of education for women every girl whether rich or poor should have an elementary knowledge of the laws of health to fit her for duties she might have to discharge as a wife or mother. He also remarked that perhaps nothing would humanise boys more than to be taught to a certain age by a woman who was fond of them, but he

thought that if the sexes were mixed in school or playground, girls might suffer from being brought into contact with the rougher and masculine nature of boys.

Although these views are very dated they served usefully for years after. Views on the education of girls had already been expressed in the

Nervous Diseases of Women.

Young females of the same age, and influenced by the same novel feelings towards the opposite sex, cannot associate together without serious risk of exciting the passions and of being led to indulge in practices injurious to mind and body.... The consequence of all this, is that the young female returns from school to her home a hysterical, wayward, capricious girl; imbecile in mind, habits and pursuits, prone to hysteric paroxysms upon any unusual mental excitement.

No detailed plan for the education of girls was put forward.

At the of the meeting the Chairman suggested it would be helpful if the two lectures were preserved in a permanent form and Laycock responded that this might be possible. It is evident that he intended to fulfil that promise. In his paper "a chapter on some organic laws on personal and ancestral memory" Laycock added a footnote saying the paper, written in 1872, was for an unpublished work and it is very likely this was for his volume on education.

Various other chapters in the Laycock collection have been provisionally grouped together as representing material for unpublished books, some duplicating that in subject files. A detailed study of all manuscripts would be very rewarding but for the purpose of this study two chapters only were selected.(13) Both are undated and taken from a group dealing with psychology, physiology, evolution and philosophy. The chapter headings are "The Fundamental Correlations of Motor Systems" and "The Cerebral Anatomy and Physiology of Phrenology". These were selected as they were expected to deal with neurology, a favourite subject of Laycock and a field in which knowledge was expanding rapidly.

The chapter on motor systems commenced by stating the fundamental idea of life and thought was the transfer of force to ends. This was of some importance to the right application of the nervous system as an excitor and director to ascertain the fundamental correlations connected with force for the purpose of ends.

Embryology taught the order of development, the 'germinal membrane' differentiated into the viscera or organs of motion which occurred in the individual according to laws of embryological development or according to the general laws of evolution. Laycock frequently referred to laws when he need only refer to an embryological or evolutionary description or explanation.

He proceeded to discuss motion starting with cilia and Robert Grant's work on cilia; they are a means of locomotion in some of the lowest forms of life yet present in the human brain. After describing motion in lower creatures, polyps and hydra, it was thought the motor organs in higher animals, the muscular tissues developed from cells which in their embryonic stage corresponded to primitive contractile cells in lower animals. The heart, a motor organ, consisting of striped and unstriped muscle contracted rhythmically in the embryo, had a very limited nerve supply and to an extent, would contract in isolation. Rhythmic contraction thus occurred in both lower and higher animals and Laycock considered this same rhythmic action continued up to voluntary action in man, as he could hear rhythmic sounds when he put his stethoscope over the contracted biceps muscle. Further biological discussion followed including that of animals who moved by squirting water. Quotations from Carpenter's Comparative Physiology were given. The transition from involuntary (non-striated) to voluntary (striated) muscle was seen as gradual, the oesophagus containing both types

In conclusion he cited the work of Claude Bernard who had demonstrated that both involuntary and voluntary muscles, when removed from the body, could be excited by galvanism. Motion in plants and animals and locomotion in higher animals differed only by higher differentiation or more advanced evolution. There was a unity of nature and a unity of forces concerned with motion and locomotion; like others in Victorian

Britain Laycock was ever attempting to integrate current developments in physics and chemistry into biology.

The phrenological chapter opened by saying the general principles which guided the phrenologists in psychology and physiognomy had been explained and it remained to investigate their researches in anatomy and physiology. These were linked as physiology without anatomy was imperfect; Gall had first felt the necessity of anatomical studies after encountering a woman with hydrocephalus but normal mental faculties. The anatomical studies were undertaken with his assistant Spurzheim and their results published in 1808 (Anatomie et Physiologie du Système Nerveux en Général et du Cerveau en particulier). Of outstanding importance was the abandoning of the old method of dissection by cutting slices of the brain in various directions and the adoption of a scraping method from below upwards to expose fibre connections. This chapter must have been written after the correspondence with George Combe, but we do not know if Laycock ever undertook dissection by this method. Laycock considered Gall and Spurzheim erred in underestimating the work of their predecessors and he described the views of Thomas Willis relating to the corpus striata. Willis also taught changes originated in the cortical substance and were then transmitted along tubes or fibres which made up the medullary substance. Laycock went on to develop his ideas of the anatomy and physiology of the nervous system starting with Willis and the division of the nervous system into (a) the sympathetic or vegetative nervous system and (b) a cerebro-spinal system. There were "afferent nerves between the skin and viscera and the organs of special sense on the one hand and the spinal cord and the medulla oblongata on the other". The impulses to the central axis might or might not excite consciousness; if they excited consciousness they were sensory nerves, if not they were excito-motor. Efferent nerves carried impulses from the central axis to the viscera, skin and muscles and excited either voluntary or involuntary movements. Movements excited without an act of volition or consciousness were reflex and excited by reflex motor nerves. Thus two orders of nerves were associated with the encephalon, the efferent divided into volitional motor and reflex motor and the afferent divided into sensory and incident motor. In

addition branches of the pneumogastric(vagus) nerves were distributed to the viscera of the thorax and abdomen as well as to the oesophagus and larynx. The older anatomists were said to view this as a separate system.

The sympathetic system was not considered a separate entity but integrated with the brain and spinal cord. The spinal cord had two functions conducting afferent and efferent impulses, these being carried in white matter termed columns of which there were three on each side corresponding to each half of the body. There was also grey matter which, to an extent, corresponded with the grey matter contained in the cranium. In addition to these there were transverse fibres connecting the spinal grey matter. Since the cranium was derived from four modified vertebrae, Laycock thought the ganglionic grey matter in the brain must correspond to four spinal ganglia. The corpus callosum was a transverse commissure of the brain connecting the hemispheres, and the fornix a longitudinal commissure connecting parts of the hemisphere on the same side. The paper does not enter into the discussion of the trophic system and how this fitted into Laycock's overall picture of the nervous system.

However more comprehensive psychological analysis and physiological research was required if satisfactory understanding of brain function was to result. Appropriately Laycock noted there was not even well grounded conjecture as to the function of the pituitary gland, the infundibulum, the mammary bodies, the thalamus and the pineal gland.

A final collection of chapters in the Laycock Collection relate to psychological medicine some of which are in another hand. One speculates that this was another book but owing to ill health an amanuensis had to be employed.

Subject headings were:

1. "Introduction. Egoistic Sentiments Thymic insanity."
2. Loose sheets titled on back "Summary of Van der Kolk on Epilepsy"
3. Loose pages on heat.
4. Loose pages on alcohol and the nervous system.
5. "Epilepsy and Epileptic seizures"

6. "Moria and Egoistic insanity. Insane folly"
7. "Social sentiments..... Social "
8. "Oinomania, Dipsomania, Potomania, Methyl mania, Methystic Orexia"
9. "Enthymics Personal Instincts and Sentiments"
10. "Self mutilation and suicide"
11. "Feelings of pleasure and pleasurable activity. Hedonic Orexiae"

If these pages were intended for an unpublished volume on psychological medicine it would only have elaborated and reworked old themes rather than presenting young practioners with a more practical textbook or manual. Laycock was too zealous for one grand overall synthesis rather than bringing mind and brain together by a number of small steps.

This chapter is somewhat fragmentary as the material for the last decade does not show any clear or new pattern.

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Chapter 10

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CHAPTER 11

SOME FAMOUS STUDENTS AND THOMAS LAYCOCK'S INFLUENCE

The close of the century following that of Laycock's death may well be an appropriate time to review his influences.

In his own day and among his own generation his influence does not appear to have been profound, his writing provoked controversy, his administrative actions resulted in differences which were at times acrimonious and his lectures in general medicine reported as unpopular. Nevertheless he did have a great influence on some students who thought highly of him and a few carried on as pioneers in neurophysiology and neuropsychiatry. It is therefore appropriate to consider some of Laycock's students in a modicum of detail. Some followed careers in general medicine or surgery and often acknowledged debt to him, some became distinguished in psychiatry and others, although not distinguished, fulfilled service posts in the growing speciality. There can be few medical teachers who have produced such a number of distinguished physicians in various fields as Thomas Laycock.

John Hughlings Jackson

Jackson was born at Green Hammerton near Knaresborough in Yorkshire on 4th April 1835 and when fifteen years of age apprenticed to Dr William Anderson of York who lectured at the York Medical School, as did Thomas Laycock. In April 1856 Jackson qualified L.S.A.,M.R.C.S., his qualification for sitting the L.S.A. (1) showing that he had previously attended the York County Hospital for a period of eighteen months, i.e. from October or November 1854. During his period at the York Medical

School Jackson attended two courses in the theory and practice of medicine taught by Laycock prior to Laycock's departure for Edinburgh. As recorded by some obituarists Jackson attended St. Bartholomew's Hospital for a short time before sitting his final examinations. He then returned to York working in the Dispensary for two or three years, before departing again for London. Here he initially went to live with another of Laycock's old students, Jonathan Hutchinson who wrote:

When Dr Jackson and myself first made acquaintance he had been some two or three years in the profession and in the belief that it did not afford attractive scope for mental powers, of which he was not unconscious, he was on the point of abandoning it, intending to engage in the literary life. From this I was successful in dissuading him. (2).

This discussion must have taken place about 1859 or 1860 and one wonders whether Laycock's Mind and Brain had just appeared and influenced Jackson in wishing to devote his life to writing. Hutchinson continued

of late, however, I have had my misgivings and have doubted whether great has been the gain to medicine it might not have been a yet greater gain to the world at large if Hughlings Jackson had been left to devote his mind to philosophy.

Laycock's influence on Jackson may well have confirmed in him an interest in cerebral localisation as popularised by Gall and his followers in phrenology, for in 1864 Jackson published on the subject of aphasia in The Clinical Lectures and Reports of the London Hospital. (3) He recorded the association of loss of speech with valvular heart disease, right hemiplegia, defect of smell and epilepsy. All of these conditions did not occur together and Jackson could recall seeing seven cases in which there was loss of speech, no hemiplegia but three had epileptiform convulsions of the right side. The symptom complex could be explained by obstruction to the blood flow in the left middle cerebral artery. He quoted Laycock's Mind and Brain giving the commonly accepted view of the time that the olivary bodies were the ganglia of speech or perhaps centres

for both movement and speech. The part of the Laycock quotation Jackson considered important was put in italics and related to the statement that disease of the anterior lobes would result in loss of speech, but a person who had thus lost speech might speak under conditions of emotional stress. Brocca's now classical papers did not appear until 1861, his idea of localisation of speech being reinforced by Jackson's work but concepts of hemisphere dominance developed slowly. By 1864 Jackson was using the ophthalmoscope; an interest in this instrument resulted from his association with Moorfields Eye Hospital. With the aid of this instrument Jackson could decide whether obstruction was proximal or distal to the ophthalmic artery by looking for retinal ischaemia. Although he did not mention Laycock in relation to cerebral blood flow and epilepsy, Jackson must have been aware of Laycock's much vaguer teaching on the subject.(4).

Jackson was to continue his observations recording cases in which spasm started in the index finger and thumb of one hand or a big toe with a gradual extension of clonic movements and late loss of consciousness. This type of epilepsy was to be named after him as Jacksonian epilepsy and was pioneer work in cerebral localisation. Further papers on epilepsies were contributed by Jackson to the West Riding Lunatic Asylum Medical Reports at the request of Sir James Crichton Browne.(5) .

Another contribution by Jackson to neurology which had Laycock associations was that of dissolution, or reversed evolution of the nervous system. This had a wide influence in neurology and was in keeping with Laycock's ideas on evolution and a continuity of function of the cerebral nervous system extending from the spinal cord through the medulla to the cerebrum. Any form of damage to the cerebral hemispheres resulted in loss of the highest and last evolved cerebral functions; Jackson applied dissolution of cerebral function to alcoholism, a subject in which Laycock was very concerned (6). His description of the effects of alcohol intake closely paralleled that of Laycock in that small quantities of alcohol led to increased mental activity with a greater flow of ideas but this was balanced by some loss of judgment owing to diminished consciousness. Larger amounts of alcohol led to increased automatic behaviour. The

writer DeQuincy was quoted as referring to a man "disguised by liquor" but Jackson thought this should read "A man disguised by sobriety" as alcohol unmasked the personality. Other toxic substances acted in this way and Jackson noted how difficult it was clinically to distinguish between alcoholism and head injury, a frequent problem for him in the receiving room of the London Hospital. In addition to the general reversed evolutionary trends Jackson added local ones causing agnosia, apraxia, G.P.I., melancholia and post ictal behaviour.

On the problem of consciousness Jackson followed Laycock in some respects but differed from him in others. Originally Jackson postulated two types of consciousness, an awareness of objects in the environment (object consciousness) and an awareness of self (self consciousness) but he later changed his mind and conceded it was out of self consciousness that object consciousness arose (7). This latter position was in line with Laycock's unifying law (8).

Jackson did not enter into the difficult philosophical questions in which Laycock was involved with mind and brain, but continued with psychophysical parallelism, a doctrine taught by Laycock.

The influence of Thomas Laycock on Jackson has been studied by Greenblatt (9) who considered Laycock and Brown Séquard together were responsible for Jackson's interest in neurology and for the development of many of his ideas. Taking Laycock's ideas about unusual reflex function as his underlying assumption, Jackson added a superstructure whose materials were largely from Brown Séquard. Association psychology was first mentioned by Jackson in 1864 but was considered to be latent in his thought from the time spent with Laycock.

Sir David Ferrier

Ferrier, a native of Aberdeen, was educated at the local Grammar School and then at Aberdeen University, where he gained first class honours at his M.A. Degree in

the humanities and philosophy. This course brought him into contact with Alexander Bain who led him to take an interest in many problems, which were to be moved from philosophy to physiological psychology. He studied further at Heidelberg where his subjects included chemistry with Professor Bunsen and anatomy with Professors Arnold and Nuhn (10), so that it is evident he had decided on a medical career well before his return to Scotland and entry to the Medical Faculty of Edinburgh University.

Ferrier was a pupil of both Bennett and Laycock. For his final he was examined in the practice of physic by Laycock and Bell who questioned him on polydipsia with its causes, parts of the brain involved in the neurotic form of renal thirst and its causes, and pretuberculous haemophysis and its origin. Further questions asked were those (on) predisposed to atheroma and diseases depending on it, on fatty degeneration of the heart, on angina pectoris and the diagnosis of aneurism of the arch and descending aorta. A very wide field in one viva! Having qualified in 1868 Ferrier became a resident medical officer with charge of Laycock's wards and during his time in this post he took a Friday afternoon lecture to summarise and explain Laycock's lectures of the previous week for the benefit of students. Ferrier's practical approach was considered a valuable adjunct to Laycock's theoretical discourses.(11). Next, allegedly for financial reasons, Ferrier became an assistant to a Dr Image at Bury St.Edmunds, where he had time to write an M.D. thesis on "The comparative anatomy of the Corpora Quadregemina". which gained for him a gold medal.

Ferrier next went to London and held various posts but was able to travel to Wakefield to take advantage of the facilities offered by Crichton Browne to carry out his well known pioneer work on the electrical stimulation of the cerebral cortex of dogs and other animals. The results of this work were published in the Reports of the West Riding Asylum for 1874 and 1875. Although postdating publication of similar experiments by Fritsch and Hitzig, Ferrier by careful work and improved techniques was able to begin the mapping of the motor and later the sensory cortex. He said that unlike Fritsch & Hitzig he employed exclusively induction currents using Du Bois-Reymond's magneto-electrometer, as it allowed a measured gradation of current. The

electrodes were simple copper wires rounded at the ends and insulated to the tips. Using rabbits, cats and dogs he showed that stimulation of distinct areas resulted in movement of various body parts on the opposite side to that stimulated and results were consistent. (12). This work was to bring Ferrier into conflict with the antivivisectionists with unfortunate publicity but he was ultimately vindicated.

At the conclusion of his paper Ferrier thanked Crichton-Browne, Milner, Fothergill, McDowall, Lauder Brunton and Galton for recording results of experiments. At times there must have been lively and constructive discussions at Wakefield for the implications of Ferrier's work were far reaching. Young (13) wrote:

Sir David Ferrier united the conceptions of Bain, Spencer and Jackson with the findings of Broca, Fritsch and Hitzig and inaugurated the classical period of experimental cerebral localisation.

His work was critical for neurophysiology in that it clearly put sensory motor action above the midbrain and it was useful to clinical medicine in that it paved the way for neurosurgery. The first successful operation for a brain tumour was in 1884 when Lister's nephew (Sir) Rickman Godlee operated on a Mr. Henderson a native of Dumfries (14).

Ferrier's experimental work confirmed the clinical findings of Hughlings Jackson and Ferrier paid him the tribute in the dedication of his work The Functions of the Brain to

Dr Hughlings Jackson, who from the clinical and pathological standpoint, anticipated many of the more important results of recent experimental investigations into the function of the cerebral hemispheres.

King's College Hospital created for Ferrier a personal chair of neuropathology and he was one of an exceptional group of neurologists at the National Hospital for Nervous Diseases. Gordon Holmes reported he did not spend a great deal of time at the hospital and his examination of patients was rarely comprehensive unless their problems

interested him, but his acute intelligence and extensive experience obviated risks of serious errors in diagnosis and treatment (15). In Holmes' time case histories and clinical examinations at the National Hospital were becoming extremely lengthy: possibly Ferrier did, as Laycock did at times, cut corners to arrive at a conclusion in the shortest possible time.

Many honours were to come to Ferrier. He became a Fellow of The Royal Society in 1876, Laureate of the French Institute 1878, received a knighthood in 1911 as well as honorary degrees from Cambridge and Birmingham.

An undated fragment has been found in Laycock's hand among the recently discovered Laycock/Carpenter correspondence at The Royal College of Physicians, Edinburgh describing the work and findings of Fritsch and Hitzig. Unfortunately there are no comments and no indication that it was part of a letter.

Sir James Crichton-Browne

Dr W.A.F. Browne was a medical graduate of Edinburgh with an interest in insanity. He is reported as a radical, anticlerical, with no time for souls or saints; the inmates of Montrose Asylum were said to have been studied by him to prove that "the fanatics canonised by the Church across the centuries had been madmen. They had overdeveloped organs of veneration in their brains", a statement with strong phrenological connotations. (16). He contended mind and consciousness were not spiritual entities but manifestations of brain activity.

His son James Crichton Browne was named after Dr James Crichton the founder of the Crichton Royal Institution of which his father became superintendent. At the age of seventeen Crichton-Browne entered the medical faculty at Edinburgh in 1857, just after Laycock had occupied his chair of medicine, he also attended Laycock's classes in Medical Psychology obtaining first place in the examination and the end of course prize. Crichton-Browne graduated M.D. with honours in 1862 having written a thesis

"On Hallucinations", he continued his general studies qualifying L.S.A. in 1863 and then proceeded to Paris for postgraduate study and experience.

After occupying various posts at Asylums as an assistant medical officer, Crichton Browne became Medical Director of the Newcastle on Tyne Asylum and in August 1866 Medical Superintendent of the West Riding Asylum in Wakefield where his most famous work was to be done. His predecessor had effected improvements in the Asylum buildings, the working conditions for the staff and quality of life for the patients. To this Crichton-Browne added academic research and meetings for those concerned with asylum work or anyone interested in the insane or any aspect of their study. His dynamic personality and example changed views on asylum work for many and he attracted many clinicians and medical scientists to work at Wakefield. He instigated research programmes which were reported in the now classical West Riding Lunatic Asylum Medical Reports which were published annually between 1871 and 1876. Any person whether a member of staff or not, could submit papers and research facilities were provided at the Asylum for members of staff and others. Conversazioni held annually were personally arranged by Crichton Browne, and these became legendary as occasions for clinical and pathological demonstrations, displays of drugs and pharmaceutical preparations and drawings or medical photographs. They were also brilliant social gatherings with refreshments and music provided by the Asylum band.

A prospectus of the Leeds Medical School 1866/7 announced students were to be taught by Crichton-Browne who in addition to lectures, gave clinical demonstrations. The tradition of close association of the Medical School and the West Riding Asylum for education in medical psychology was to be a lasting one.

Among the famous who worked at Wakefield, attended meetings or published work in the Medical Reports were John Hughlings Jackson, David Ferrier, Clifford Allbutt, William Broadbent, John Fothergill, John Bucknill, William Carpenter, William Turner and Thomas McDowall (17). So far as is known Laycock did not attend any of these meetings.

Crichton Browne attracted several young men, keen on research in psychological medicine to work at the West Riding Asylum or to contribute to the asylum's medical reports of whom many, as noted, had been students of Thomas Laycock; it is possible there was correspondence between Laycock and Crichton Browne about these men but unfortunately none has been found.

Crichton Browne joined what was then the Association of Medical Officers of Asylums and Hospitals for the Insane in 1863 and was quickly involved in committee work becoming President in 1878 of the Medico-Psychological Association previously called the Association of Medical Officers. In his presidential address (18) he indicated that the great advances in knowledge of the nervous system had sadly not been made by those working in asylums. Speculating on the future developments great possibilities were seen for cerebral localisation, neuroembryology, the pathological chemistry of the brain, psychological experiments, the application of the thermo electric pile, the microphone and other instruments to elucidate intracranial conditions. A case of David Ferrier's was recalled in which "hallucinations of a special sense were removed by a continuous electric current".

Crichton Browne regretted asylum officers were not writing and researching on matters peripheral to insanity and wrote:

In those latter regions of psychological inquiry which are in such close contact with our own field, the work is again being carried on by those unconnected with us, by Herbert Spencer, Lewes and Bain, whose labours have been so discursive; by Darwin who has given us his admirable studies of emotion, by Mr Francis Galton, who has so perspicuously traced out the hereditary transmission of mental traits, and who is now busied with inquiries of superlative importance into the time occupied in mental processes: by Mr Romanes who is diligently digging up the radicles of mind; by Mr Grant Allen who is delineating the foundations of our

aesthetic perceptions and feelings.

The influence of Laycock can be seen in four extracts in the address.

Meteorological influences were in his mind when he wrote "The discovery of gas was almost equivalent to a change in the earth's diurnal rotation as affecting the length of day and night and must have been followed by corresponding modifications in the periodicities of the nervous system." On the effect of current life in mental disturbance he said "The Pressure of modern life falls especially upon the nervous system, and the danger of this pressure lurks perhaps in the suddenness with which its incidence changes" words which echo Laycock's as does his comments on the nervous system when he wrote "But the nervous system cannot, on assuming new responsibilities, discharge itself of old cares and incumbrances. In its textures are inextricably interwoven ancestral wisdom and folly: in its ganglia are embedded the feelings and instincts of lower animals." Degeneration or reversed evolution was accepted by Crichton Browne "And it is in the increasing complexity of the nervous organisation, and in the rapidity of the successive modifications to which it is subjected, that some of the risks of degeneration are to be found."

The essence of Laycock's teaching was thus continued by Crichton Browne but he did this more by encouraging others and administrative action than by undertaking research himself. He was much more successful in stimulating neuropsychiatry and neurophysiology than the philosophy of the mind, brain problem.

Sir Thomas Clouston

Clouston initially received his education in Aberdeen but in 1856 at 16 years of age enrolled to study medicine at the University of Edinburgh where he met two men who were to greatly influence his life and work, David Skae and Thomas Laycock. The summer lectures on Medical Psychology had just started; Clouston found these most original and was later to write of Laycock "He promulated the law of reflex action and

in my opinion anticipated Spencer and Darwin. He was a daring speculator and thinker. He was not afraid of startling conclusions, tried to include all mental phenomena in animals and man, in health and disease within his generalisations and was the most suggestive writer on the subject at the time" (19). After a short period as an anatomy demonstrator, Clouston started work at the Edinburgh Royal Asylum with David Skae as his chief but left after two years to become Medical Superintendent of the Cumberland and Westmorland Asylum at the early age of 23 years (the youngest to achieve such an appointment). In this post Clouston proved himself an able administrator but also accepted Laycock's suggestion that much could be achieved by empirical observation, and Clouston wrote on the use of opium, potassium bromide and cannabis indica in insanity (20), work which gained for him the Fothergillian Gold Medal. Clouston became with Henry Maudsley, whom he greatly admired, co-editor of the Journal of Mental Science and in 1873 returned to be Superintendent of the Edinburgh Royal Asylum, a post made vacant by the death of his old chief David Skae.

Clouston agreed to his former teacher, Thomas Laycock, conducting his classes in medical psychology at the Asylum while he (Clouston) demonstrated pathological and anatomical specimens. After Laycock's death Thomas Clouston was appointed to a newly created post of lecturer in mental diseases and proved himself to be one of the most brilliant lecturers at the University (21) although perhaps somewhat of a showman. Clouston joined in the struggle to make the study of insanity part of the medical curriculum but this was not accomplished until 1889 when the General Medical Council made the subject compulsory for all medical students.

Like Laycock he pressed for an acute psychiatric ward in the Royal Infirmary as it would lessen the stigma of mental illness and be more accessible to students, but like Laycock, his wishes were unfulfilled. He was more successful in his efforts to obtain pathological services for asylums and through his efforts the Scottish Asylums Laboratory was opened in 1887.

Throughout his life Clouston reconciled his religious beliefs with natural science by following Carpenter and Bucknill rather than Laycock. He fully accepted evolution

and a pathology of the brain in insanity but for him mind had a spiritual role. In his later life more of his writings were directed towards a fusion of religion and science. The way to mental health was self control and the disciplined life; he called for a "health apostolate" who would teach the ways of "physical righteousness".

Thomas Clouston was a man who practised what he preached and remained an asylum superintendent involving contact with many antisocial patients and necessitating manifold administrative difficulties and problems. Alongside his interest in neuropsychiatry he had a genuine sense of vocation to work with the mentally ill.

Sir Jonathan Hutchinson.

Hutchinson was born in Selby, Yorkshire in 1828 to a Quaker family and educated locally. He started his professional life by being apprenticed to Mr Caleb Williams of York, also a Quaker, and who lectured at the York Medical School where Hutchinson enrolled in October 1847. Thomas Laycock lectured at the school from 1846 so that Hutchinson had been instructed by Laycock and was especially influenced by his teaching on heredity. Later Hutchinson moved to London and entered St Bartholomew's Hospital qualifying M.R.C.S. and L.S.A. in 1850.

After various posts Hutchinson became an assistant surgeon at the London Hospital in 1860, F.R.C.S. in 1862, a full surgeon in 1863 and in the same year was appointed surgeon to the Royal London Ophthalmic Hospital. Some idea of his industry and approach to surgery can be obtained from his address to the London Hospital students at the beginning of his second session when he said "Observation is the only way to maintain the balance between reason and imagination" and continued:

A surgeon will be sent to the dissecting room, he will devote days and nights to the laboratory and the study; he will come to treat his fellow men, for the time being, as if they were so many machines: he will appear to be absorbed in dry, hard matter of

fact science when possibly he is urged into these very pursuits by a depth of feeling of which those who criticise him know nothing.

Hutchinson acquired a number of high offices: Examiner Royal College of Surgeons 1880-1887, a member of Council from 1879 and President in 1889. President of the Royal Medical and Chirurgical Society 1894-6, President of the Pathological Society 1879-80, President of the Hunterian Society 1869-70, President of the Ophthalmic Society 1890 and President of the Neurological Society 1887.

He is known to students today for his description of congenital syphilis involving abnormalities of the skin, eyes and teeth and wrote a massive ten volume work Archives of Surgery (22).

Like Laycock he was reported not to be concerned with the mere acquisition of facts but in integrating these with other knowledge. He remained a life long friend of Hughlings Jackson and Sir Jonathan Hutchinson's laudatory remarks on Laycock as a teacher who had considerable influence on him are noted in chapter 7.

One subject in which Laycock influenced Hutchinson was that of diathesis, on which Hutchinson published a small volume.(23). Hutchinson thought Laycock's classification of constitution the best available, but he did not discuss Laycock's embryological basis for diathesis. By 1884, when Hutchinson's volume was published, the germ theory of disease was in its infancy which led him to doubt if there was a true diathesis for syphilis. The diathesis prepared the soil for disease and accounted for diseases running in families.

Honours in abundance came to Jonathan Hutchinson, he was awarded honorary degrees by Leeds, Glasgow, Dublin, Edinburgh, Cambridge and Oxford. He was a Fellow of the Royal Society and knighted in 1908.

Sir Byrom Bramwell

Bramwell is a familiar name to those associated with the medical history of Edinburgh and the line started with Byrom Bramwell who arrived from the north of England to study at Edinburgh. After a considerable struggle he became established in the city and in 1923 gave an address entitled "The Edinburgh Medical School and its Professors in my Student Days 1865-9" (24).

Of Laycock Bramwell wrote:

[He] was a remarkable man: he was a great medical philosopher, an original thinker and investigator; he had a very acute intellect, a subtle and highly speculative mind; he was a great collector of facts, always trying to find out the reason of things; he thought about everything which came under his notice and he generalised about everything he thought about. Laycock was a man of immense and unceasing energy--- Laycock never had much practice as a consultant in Edinburgh. He did not impress me as a great clinician or teacher---as a systematic lecturer Laycock was not well suited to the ordinary student; personally at all events. I often found him speaking over my head.--- But in spite of his little failings Laycock was a really great man; often far ahead of his time.

It is thus evident that Laycock could produce a profound impression on, at any rate some, of his students.

Sir Thomas Lauder Brunton

Thomas Brunton, a medical student at Edinburgh qualified in 1866 proceeding to the M.D. with Gold Medal in 1868; he was thus another student of the Laycock era. Brunton worked at the West Riding Asylum although never on the staff and contributed articles on peripheral and central inhibition in the nervous system to the West Riding Lunatic Asylum Medical Reports and he assisted Ferrier and Fothergill with their researches.

It is not however in psychiatry or neurology that Brunton spent his working life but as a physician and pharmacologist at St Bartholomew's Hospital and he is remembered for his discovery of the beneficial effect of amyl nitrite in coronary artery disease. Thomas Brunton was awarded a D.Sc. degree in 1870 and was knighted in 1900.(25). His work in Carl Ludwig's laboratory on pharmacological vasomotor control can be seen as a link with Laycock's interest in the effect of organic nitrites producing blushing and rapid heart action.

Thomas William McDowall

McDowall graduated M.D.Edinburgh in 1866 and L.R.C.S. in 1870; he was thus a student at the time Thomas Laycock occupied the Chair of Medicine. McDowall is of importance in that his was the first appointment of a pathologist specifically to an asylum becoming pathologist to the West Riding Asylum in 1872 and Crichton Browne who was responsible for the appointment wrote in his report for the visiting Committee in 1873.

The appointment of a pathologist which you have thus sanctioned is, I believe, a somewhat momentous step in the march of scientific progress in the Lunatic Asylums of this country.

As far as I am aware, no other asylum is yet provided with such

an officer, but there can be little doubt that the example set here will be followed before long in other counties, with the result of rapidly expanding our knowledge of brain disease and the means by which it may be averted and controlled. It is proposed that our pathologist should perform all post mortem examinations, should have the care of the museum which we are endeavouring to form, should undertake any special enquiries or experiments which are deemed desirable by the Medical Director and should by microscopic and chemical research seek to elucidate some of the dark points which are still so numerous as to make a Cimmerian gloom of cerebral pathology (26).

Unfortunately McDowall did not expand knowledge of the brain or its pathology as hoped but he did investigate colour blindness in insane patients, so far as this was possible.

He later left the West Riding Asylum to become superintendent of the Northumberland County Asylum and finally, Professor of Psychological Medicine at Newcastle-on-Tyne. McDowall was one of many, although perhaps one of the more distinguished of Laycock's students who entered the rapidly expanding field of psychological medicine when formal training in the subject was minimal.

John Milner Fothergill

Fothergill, another Edinburgh medical graduate, gained his M.D. in 1868 during the period in which Laycock occupied his Chair. Fothergill was a frequent visitor to the West Riding Asylum and contributed papers on "Heart sounds in general paralysis of the Insane", "Cerebral anaemia" and "Notes on the therapeutics of some affections of the nervous system." Whether Laycock played any part in introducing him to

Crichton Browne is unknown.

Like Brunton, Fothergill did not pursue a career in psychiatry, although initially interested in the subject as shown by his early papers. Probably the administrative duties of superintendent and its connections with officialdom deterred him. Crichton Browne wrote to Darwin in the years 1869 to 1873, expressing his frustration at these tasks. (27). He became a physician to the City of London and West London Hospitals. His subsequent publications must have been of a high quality for he obtained the Hastings Gold Medal in 1870 and the Medical Society of London Fothergillian prize in 1878 but died prematurely in 1888. (28).

Another side to Laycock's influence concerns the extent to which students from Laycock's classes in medical psychology at Edinburgh did in fact fill the vacant asylum posts. Examination of the membership list of the Medico-Psychological Association for the year 1874-85 revealed that there were some 400 members of whom about 21 per cent were Edinburgh graduates. This however includes many who were general physicians such as Dr Begbie and Dr Balfour, but of the Edinburgh graduates approximately 17 per cent were asylum medical officers or superintendents. This could be an under-estimate as a few gave their addresses without giving their occupation, but it seems that Edinburgh did in fact make a worthwhile contribution to staffing asylums with trained medical personnel.

The Sequelae to Thomas Laycock's ideas and Work

The immediate influence of Thomas Laycock on his one time students John Hughlings Jackson and David Ferrier has already been noted. Kurt Danziger has said of Laycock

his was one of the most original minds among the mid-nineteenth psychophysicologists. His paper published in 1845 and entitled Reflex Function of the Brain was a kind of cock's crow announcing

the whole of the psychophysiological trend. John Hughlings Jackson outshone his teacher and Danziger considered Jackson adopted Laycock's central notion of cerebral reflex action and used it to establish the principle that all levels of the nervous system functioned in accordance with the sensory motor model.

.....from this it was only a short step to the claim that the mental symptoms of disease are fundamentally due to a lack, or disorderly development of the sensory motor process.

.....this was a suggestion that received reinforcement from the experimental research of Ferrier on the production of movements by direct stimulation of the hemispheres. (29).

It is generally acknowledged that Ferrier's experiments were to determine the pattern of brain research for the twentieth century.

Sensory and motor maps have been made of the cerebral cortex and in the case of the visual cortex this has been examined in a remarkable way by Hubel and Wiesel showing that not only is there a point to point correspondence between the retina and visual cortex but in a vertical direction all cells corresponded to the same stimulus. However with oblique penetration different cells corresponded to different spatial orientation of stimuli (30). Similar investigations have been made for somatic sensory areas. Electrical brain stimulation has been applied to the deeper brain areas, a subject pioneered by W.R. Hess working mainly on the upper brain stem of the cat; it was found certain locations resulted in 'sham' rage so called because the effect ceased on stopping the stimulation. The same electrodes could also be used for producing localised destructive lesions and the beginning thus made on depth brain mapping (31). Papez saw the anatomical connections described by Hess as important; they were part of a group of structures called by Broca the limbic system, a system for the expressions of emotions.(32). A key part of the limbic system was the hippocampus, a significant portion of the brain in reptiles which becomes overshadowed by the neocortex in the higher mammals. Moving on a decade Moruzzi and Magoun using the same basic technique of electrical brain stimulation found that when the electrodes were in certain

parts of the reticular formation, arousal from sleep and alerting mechanisms resulted. (33). Yet another decade and important contributions were made by Olds and Milner (34) working with electrodes implanted into the rat brain they found the animals would self stimulate with electrodes in the septal area, one focal point in a distributed 'pleasure' system.

In a modern paper dealing with two way links of the corpus striatum, the cerebral cortex and limbic system, the author considered that central motor mechanisms and thoughts had common elements or they overlap and in support of such a view quoted Hughlings Jackson:

but of what substance can the organ of mind be composed unless of processes representing movement and impression; and how can the convolutions differ from the inferior centres except as part representing more intricate co-ordination of impressions and movements in time and space? There is proof although indirect on the opinion that feint and central excitation of sensori-motor processes suffices in thought. (35)

Thus there is evidence going back over a century that sensori-motor processes are not entirely different from those involving ideas. No doubt Carpenter would point to his ideo-motor reflexes and Laycock would claim priority in that he wrote in his paper on Reflex Function of the Brain "if the brain be indeed the organ of ideas and the cerebellum of combined movement the inference ^{is} manifest that they are both excitors of reflex action".

Although concepts appear to have moved in a circle in one respect, considerable differences exist today from the period of Carpenter and Laycock both in philosophy and theology. In recent years psychology has been involved with subjects previously considered unsuitable, such as consciousness; a subject neurobiology has now begun to investigate (36). Laycock would have rejoiced to read of this since consciousness was at the core of his thinking on psychiatry. Since the mid-nineteenth century theologians have followed various paths, some adopting Christian mysticism, some Christian

socialism and some discounting rationality entirely and advocating religious fundamentalism with revealed religion. A few have followed the path started in Laycock's time by thinking that absolutes are by their nature unknowable except perhaps in forms of symbols. The problems facing the church since the beginning of the nineteenth century are well known (37) but a satisfactory solution has yet to be reached.

The relationship between mind and brain is still an important issue today, a recent number of the Scientific American (38) being devoted to the subject. Great strides have been made in neuro-physiology and more will be made in the future, the new techniques of brain imaging using positron emission tomography and nuclear magnetic resonance linked with specific psychological tasks offer great promise. The difference between neuro-physiology and subjective experience will doubtless narrow, but whether what has been called the "cognitive gap" will ever close may be problematical as consciousness is fundamentally different from physical phenomena like bio-luminescence.

Nevertheless the importance of physiology remains, G.D.Fichbach, Professor of Neurobiology at Harvard University writes:

Our survival and probably the survival of this planet depend on a more complete understanding of the human mind. If we agree to think of the mind as a collection of mental processes rather than as a subject of spirit, it becomes easier to get on with the necessary empirical studies. (39).

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CHAPTER 12

CONCLUSIONS

Thomas Laycock was a little regarded figure in the history of medicine until recently (1). From about 1960 this changed with the development of interest in physiological psychology and its relationship to philosophy and theology. It is hoped that this thesis has shown that Laycock needs to be seen in a wider context than this.

It was remarkable that one who started a career as an apprentice to two surgeon apothecaries in a small Yorkshire town should rise to be the Professor of Medicine in the University of Edinburgh, one of the most prestigious posts in the world of academic medicine. This he did without significant wealth or influential patronage at a time when these were important. An able author could write an exciting biography.

From his youth Laycock was undoubtedly ambitious but to satisfy this in such a spectacular manner, he must have had some exceptional personal qualities. His schooling was that given to the sons of all Wesleyan clergy and although we know nothing of his school attainments, his writings show an extensive knowledge of classical and modern languages as well as literature and philosophy, the basis for which was acquired in his school days. All obituarists have paid tribute to Laycock's intelligence and industry, qualities which were manifest from very early days and compensated for his lack of verbal fluency and poor physique.

Personal Character

Throughout his life Laycock was involved in various professional controversies and it is possible to think he was an aggressive, cantankerous character. It has been seen however, especially from his journal, that there were many instances both in his personal life and in relation to his patients which show a different light. Prior to 1858 it was difficult for all medical men to make a living, a situation which led to great strife with the profession. The conflicts described in Edinburgh (2) and Wakefield and Huddersfield (3) were nationwide and characteristic of the time. A doctor who was not prepared to fight for himself would hardly have survived.

Public Health

Laycock's efforts in sanitary reform were not inconsiderable. His statistical work in the City of York for the Commissioners report on the State of Large Towns and Populous Districts was, as were his other statistical reports on sanitation, water supply, drainage and housing, important to the public health debates of the time. He strongly advocated public sanitation and hygiene and personal hygiene through cleanliness and moderation in drinking.

A tribute to Laycock's work in public health in the City of York was paid by the Archbishop, Dean and Chapter when they wrote:

We would, however, more particularly express our deep sense of the benefits Dr Laycock has conferred upon the City of York and the general public by his strenuous efforts to detect the causes of disease as they affect the population at large (4).

Reflex Brain Function

It was possibly Laycock's greatest achievement to extend the concept of reflex action to the brain, although others independently made the same suggestion shortly after. Laycock saw reflex function as a basic unit of behaviour. He also thought there was cerebral localisation of function, although not in terms of the phrenologists' organs, and he considered there might be a physical basis for association psychology.

Philosophy

These concepts led to "mind" having a physical basis and consequently to philosophical and religious difficulties. These were problems to which Laycock devoted considerable thought and writing, a situation which led to some considering him chiefly a philosopher and unfit to teach medical students. However he always endeavoured to give his philosophy a practical basis. One who knew him well wrote:

Laycock's philosophy is therefore not confined to 'the mind' and its manifestations in consciousness, but ranges over the whole creation, and his metaphysics are not deductions of abstract thought, but the generalised representations of events, mundane and cosmic. He simply reversed the famous Cartesian aphorism, *Cogito ergo sum* and proclaimed the opposite doctrine, *sum ergo cogito...* (5)

Neurology

Interest in neurology led Laycock to use neurological ideas to explain many physical signs and pathological lesions as described in Chapter 9. These speculations have not persisted although his contention that cells seen in pathological tissues were the

result of their returning to embryological form attracted considerable attention at the time.

General and Psychological Medicine

Laycock's writings in general medicine were comprehensive and included such conditions as scurvy, blood and gastro-intestinal diseases. In these there was evidence of wide reading, including Continental literature; his views were well balanced and in keeping with the best knowledge available at the time.

Psychological medicine or psychiatry was of special interest to Thomas Laycock. He used his ideas on reflex brain function to account for the symptoms of hysteria, mesmerism and most psychiatric symptoms. His knowledge of the subject was not only theoretical for he had ample clinical experience both in York and Edinburgh. His concern extended in a practical way to the many administrative problems facing those medical officers working in asylums, and to forensic psychiatry.

Medical Education

It is as a teacher that Laycock has been most criticised, as medical students needed practical positive instruction rather than poorly delivered discourses with much philosophical content. There are however other aspects of medical teaching in which he was successful. He was much better in the clinical situation and one obituarist wrote:

Dr Laycock brought to the bedside a long acquaintance with and intimate knowledge of disease and his pupils will long remember the many curious points he noticed in each case which would have passed unobserved but for his keen perception.(6)

He also realised the majority of his students would be general practitioners and would find physical examination in the domicillary situation much more difficult than in hospital; if palpation, percussion and auscultation were not possible, at least inspection should be thorough.

It was in the field of psychiatric education that Laycock is most remembered. He taught psychological medicine both at York and Edinburgh and at the latter was instrumental in making it a subject on which a question could be set for qualifying examinations.

Thomas Laycock's Influence

An account of the life and work of Thomas Laycock may well end here with so much being done by one man in such a period of intellectual upheaval, social change and medical and technological development. But to do this would neglect one of the important results of his work, the influence he had on a small number of his students and through whose work and writings Laycock's ideas were to continue and evolve even if the debt to him was not overtly acknowledged. Hughlings Jackson developed the concept of excitomotor actions of the cerebrum (7) and to prove Jackson correct David Ferrier mapped the cerebral cortex for motor and sensory function by electrical brain stimulation or localised ablation. The techniques developed by Ferrier have, with refinements, been used to the present day and have proved most successful in understanding brain function.

The writings and thinking of Laycock were in keeping with the evolutionary writings of Darwin and Spencer, so that social behaviour could be seen as evolutionary as well as the function of various somatic organs and systems. Indeed Laycock can be said to have anticipated both Spencer and Darwin in indicating an evolution and development of behaviour which had a physical basis. He further originated the idea of reversed evolution which was so ably developed by his pupil John Hughlings Jackson.

The time may have come for a further step. R.J.Richards in a chapter on Darwin and the biologising of moral behaviour in a volume on psychology in nineteenth century thought writes "I would like to direct an historical analysis to a modest but controversial proposal made by Edward Wilson in his book Sociobiology that 'Scientists and humanists should consider together the possibility that the time has come for ethics to be removed temporarily from the hands of the philosopher and biologicized' "(8) In this light Thomas Laycock can be seen as not an insignificant person but one worthy of consideration in the history of medicine.

For indeed it is one of the lessons of the history of science that each age steps on the shoulders of the ages which have gone before. The value of each age is not its own, but is in part, in large part, a debt to its forerunners. And this age of ours if, like its predecessors, it can boast of something of which it is proud, would, could it read the future, doubtless find so much of which it would be ashamed.

Sir Michael Foster

Lectures on the History of Physiology.

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No complete bibliography of Thomas Laycock's works exists: they are said to number about three hundred some one hundred and fifty being claimed by him in 1855. Often a collection of papers on one subject, e.g. dropsy or bronchitis would be published as a pamphlet or monograph. Those in this bibliography are only those used in the thesis, many others have been read.

Before 1853 reviews in the British and Foreign Review were published anonymously and Laycock claimed many of these when he listed his publications for the Patrons of the university of Edinburgh. These have been listed under Laycock's name. There were probably others he did not wish to claim in which he had written adversely about well known people. In the list of review publications Laycock sometimes gave a general title such as Medical Ethics rather than the actual titles of the volumes reviewed.

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