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President's Address

PROGRESS OF MEDICINE AND SURGERY IN NEWCASTLE UPON TYNE

BY

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I must first express my grateful thanks to my colleagues of the Newcastle Division for proposing my name as President for this year, and to my colleagues in the Association for electing me to this high office. When I recall the great names of those who have held this office with such distinction I realize how poor are my qualifications for this important position. This is the first time it has been held by a surgeon in Newcastle. When previously the British Medical Association has honoured Newcastle by holding its meetings here, the honour has always fallen on a medical colleague.

I must also take the opportunity to thank the individuals and organizations who have contributed so much to assure the success of this Meeting. First, I must thank the University through the Rector, Dr. Bosanquet, and Mr. Hanson, the Registrar of King's College, for going to such great trouble to meet our difficulties. They have gone even further, and have invited you all to a reception. I must also thank the Lord Mayor and the Corporation of this city for granting us the use of the City Hall, and for inviting us to meet them at a reception and dance.

Our grateful thanks are due to the members of the Arrangements Committee and the subcommittees, and to others, for the immense amount of thought, time, and energy they have put into their efforts to make a success of all the different functions that have been arranged to make this Meeting worthy of the traditions of Tyneside.

It is my privilege and pleasure also to welcome every one of you to Newcastle upon Tyne. We feel honoured that the British Medical Association has chosen this town as a suitable place for its Meeting, and that you have taken the opportunity to attend. I hope you will learn something from the Scientific Meetings and Exhibitions, and have some time off at least to enjoy the social events and the excursions which have been arranged.

Newcastle has had the pleasure of entertaining the Association on three previous occasions, in 1870, 1893, and 1921, and the growth of the Association in member-

ship, in its activities, and in its importance has progressed out of all recognition in the interval.

The last time the Association met in Newcastle was under the Presidency of Sir David Drummond, who gave his address in the King's Hall, Armstrong College. Mr. (later Professor) R. S. Willan was the honorary local secretary of the Meeting, during which a well-known present feature of medical life in Newcastle—the Medical Institute—was opened. This, much altered, is now the British Medical Association regional office, the centre of many official and social events. At the time of the 1921 Meeting I was a senior student, and did my first work for the Association by arranging two dances. I still treasure the letter of thanks I received from the then Council of the Association signed by Sir Robert Bolam, the local physician, so well known, who did so much for the Association that our present Headquarters are sometimes called his monument.

Now comes the most difficult part of my task, that of giving an address to such a distinguished audience. After the thrill of being made President-elect had subsided, I started to think of the various subjects which had not been used in the ninety-odd addresses delivered since the British Medical Association was founded under that name. I had decided to talk about the main milestones in the history of surgery, when it was suggested to me that this had been done before, though not recently. The same adviser suggested that a subject of local interest would be more popular, and that, as the history of medicine in Newcastle had never been extracted from the numerous books, pamphlets, and minutes, this would make an interesting and possibly useful contribution.

I therefore propose to talk about the progress of medicine and surgery in this area, illustrated so far as possible by examples of institutions, societies, and some of the men who, in company with their colleagues in other parts of the world, were slowly advancing the knowledge of medicine for the benefit of the sick. This is too big a subject to deal with adequately in a short address, and therefore you must excuse me if I dismiss some parts with only a brief reference.

Roman Times

The first medical man of whom we have records was a Roman, not unexpected when we recall that this area is noted for the number of Roman and mediaeval remains, of which the most important in Northumberland is part of the Roman Wall and its related works, one of the mightiest antiquities remaining in England. In many parts the Wall stands five feet high, having for nineteen hundred years withstood the ravages of time and weather, and, more severely, the ravages perpetrated by the hand of man. It stands for something more than a dividing barrier between North and South; it remains a sign of the desire for peace expressed by the famous Roman emperor who conquered the area, and, though the Wall and its works were not erected until some years after his withdrawal from the country, they helped to give the greater part of England a peaceful period lasting nearly three hundred years, during which a civilized standard of living was attained which was not equalled again for centuries. Romans may have conquered, but they brought civilization and in many cases freedom to those they overcame.

The earliest mention of a medical man comes from these times. In a fort, Housesteads, about 25 miles west of Newcastle, was found the tombstone of a medical orderly, and it can now be seen in the Blackgate Museum. The inscription gives his name, the name of the unit in which he served, and his age at death—a young man only 25 years of age.

Might we not picture this medical man stationed on the cold and windy heights of the Whinsill, giving some of his spare time and skill to those wives, children, and dependants who were always found in the neighbourhood—a village settlement attached to a fort—in fact, acting as their general practitioner-specialist, in a place then comparatively populous, though now so sparsely inhabited that no doctor resides within six miles of it?

The Roman Army had a complete medical service, the trained doctors coming from the eastern part of the Roman world. Of the training of the lower medical ranks in the army we know very little; there was probably nothing systematic in it, and it was gained largely through apprenticeship. These medical orderlies performed surgical operations, removed foreign bodies and arrowheads, and did amputations by methods of which the descriptions are on record. In the Black Gate Museum you can see their instruments—knives, probes, hooks, forceps, saws—not so very different from those we use to-day.

Early Newcastle Records

Following Roman times there was a long period during which no written records were kept, and certainly nothing about medical men or the treatment they gave. After this the first record I can find of a Newcastle medical man comes from Mr. Sidney Gibson's *History of the Priory and Convent of Tynemouth*. In this it is stated that King Edward II was at Tynemouth on April 26, 1312, and from his wardrobe account emerges the fact that a payment of 14s. 4d. was made to Mr. Wm. de Barntort, who was called down from Newcastle for attendance on Lord Peter de Caveston, Earl of Cornwall, a favourite of the King, and that the same fee was paid to a monk of Tynemouth, Brother Robert de Bermingham, for his care in the same case. This seems to be the first report of a specialist being called to a consultation—and a general practitioner—that is, the monk—carrying out the treatment advised. We are not told of the nature of the illness or of the treatment given, but the complaint

cannot have been serious, as the Earl was able to sail away with the King on May 5. William de Barntort seems to have had a brother who was also a medical man in the district, because the King in 1346 granted him certain lands in Tynemouth.

Another local record of a medical man of this period occurs in Eyre's *History of St. Cuthbert*. A surgeon, Galfred de Saleby, was granted a room and food on the Inner Farne Island, and in return for this he undertook to treat the monks and their servants in the area, even travelling as far as Durham. This medical man was almost certainly trained in Newcastle or Durham.

The Guilds

After this, most early information about medicine in Newcastle comes from the records of the Barber Surgeons and Chandlers Guild of Newcastle. Some of the Minute Books of that society still survive. The earliest one, in 1616-80, mentions the date of the municipal licensing of the Guild in Newcastle, on October 10, 1442, and gives the following extract of their duties:

"That they should go together in procession on Corpus Christi Day in a livery, and afterwards give a play 'The Baptizing of Christ' at their own expense.

"Every man to be at the procession at Newgate when his hour is assigned to him on pain of forfeiting a pound of wax; to go with their pageant when it shall be a play in a livery under similar conditions.

"That no alien shall be taken apprentice or allowed to work within the town or without, under penalty of twenty shillings.

"That the Society should 'uphold the light' of the St. John baptist in St. Nicholas Church as long as they were of ability."

There is no doubt that guilds of this nature were in existence long before this time, as an Act of 1363 compelled every surgeon to belong to one. Another Act in 1387 enforced a regular return of the Guilds' Rules and Property, while a third Act fixed the length of the apprenticeship at seven years.

The guilds had not only monopoly of practice but also the power of regulating the work of their members by insisting on consultations with their colleagues in important cases and on the general efficiency of their members.

A further step in State regulation took place in 1436, when a Statute enacted that the "ordinances" of surgical and other guilds must be submitted for the approbation of the magistrates of each city, and accordingly we find municipal licensing of the Barber Surgeons Guilds in London, York, Bristol, Newcastle, Salisbury, and Exeter.

The Common Council of the Municipal Authority, besides licensing the guilds through their magistrates, also acted as an appeal tribunal to which disputes could be referred. The type of appeal usually heard was against non-members practising in the city and applications for permission to seek apprenticeship elsewhere from apprentices who had committed a misdemeanour. The "closed-shop" principle seems to have been very successfully applied among members of the Barber Surgeons Guild. After the inspection and ratification the rules were enforced by the city authorities by fines and imprisonment.

The Barber Surgeons Company in Newcastle still has legal existence. Of course, under the present Act it would have no licensing powers, even if it had kept up its old lectures and examinations.

At the height of the activity of the guilds the students were not only apprenticed to licensed surgeons but went through a regular course of anatomy, with dissection, surgical lectures, and examinations, and in many instances post-graduate work and lectures. Many guilds of barber surgeons acquired libraries, and in Newcastle the Guild was proud of having received a copy of Bartholin's *Anatomy*.

The type of medicine practised at this time is well described by Guy Patin, who reduced all cases to either bleeding or purging. Age made no difference—he bled old and young; he bled 32 times for a single illness, and up to seven times for a cold; he bled his mother-in-law, who was 80, up to four times; he bled a 3-day-old child; he bled his wife eight times in the arms and then in the feet. He describes the case of a patient who was purged 32 times in two consecutive days; then there is another who was bled 24 times and purged 40 times. Finally, he states, "We cure many more patients with a good lancet and a pound of senna, than the Arabs could with all their syrups and opiates."

There is no record of where the Guild met until the Minute Book of 1616, which states that the members usually met in Pandon Gate, one of the town wall gates, or in their own houses.

In 1646 a house was taken in Silver Street (now demolished); but this cannot have been very satisfactory, as the Guild soon petitioned the Corporation for a site, and this was granted in 1648 on a sixty-one-year lease; it was just to the east of the Holy Jesus Hospital. The new Hall, with a herb garden, was in use by 1652, and a description is available in the Diary of Celia Fiennes, a lady who toured the country on horseback in the late seventeenth century. This hall, with alterations, continued in use until 1830, and it became the home of the newly formed Newcastle Medical School in 1834. It was demolished to make way for railway extensions in 1851, when a new hall in Victoria Street, Westmorland Road, was built for the Guild by the railway company. Teaching was carried on there till 1857, when it was sold to St. Paul's Church as a parish hall, which it still is.

Minutes of the Newcastle Guild

The Minutes of the Guild make amusing and interesting reading, but unfortunately do not give many details of the practice of medicine. They are mostly concerned with sums of money spent on dinners, and the upkeep of the house and garden, and money given for such charitable objects as "distressed brethren" or a "shipwrecked surgeon" (Dispensary, October, 1777). An unusual subscription is recorded on May 21, 1722, when £2 2s. was given towards "The Plate," probably the well-known local horse race which is still run in the summer.

Fines for various offences occur regularly and must have proved a fruitful source of income—for example, for not attending meetings and funerals, for swearing and using abusive language at meetings.

Apprentices appear to have given considerable trouble and were rather harshly supervised. They had to serve for seven years, during which time they might not marry or serve in the "shop" unsupervised (in London they were not allowed to wear a beard of more than fifteen days' growth). An apprentice discharged for a misdemeanour could not be employed by any other freeman of the Guild in the city.

The teaching of anatomy seems to have begun in 1692, when £4 10s. 2d. was disbursed on "dissection," possibly the price of a body, but no names of dissectors are given. It is recorded that in 1711 a skeleton was bought.

In 1753 Mr. Hellowell, a surgeon at the infirmary, was given the body of a woman who had murdered her child, and he and three other surgeons lectured on it and dissected it. In 1691 a surgeon who was not a member of the Guild was prosecuted for practising in the town, and another surgeon was similarly prosecuted in 1720. The Guild kept in a case a set of instruments which could be borrowed at a certain charge; note is made that "they must be made good if lost, and that a surgeon must deliver them back in such condition as he receives them." Sums disbursed for cleaning the instruments are mentioned. These instruments, twenty-six in number, were contained in a handsome case with the arms of the Barber Surgeons carved on the lid, and consisted of knives, cauteries, probes, hooks, needles, saws,

bullet-removing forceps, and dental instruments. On one occasion they were pawned by the borrower (whose name is not given) and had to be redeemed for forty-five shillings. The case of instruments used to hang in the lecture room of the first medical school, and is now in the Black Gate Museum.

From the Minutes, members of the Guild practised not only in Newcastle but in North Shields, and they certainly did in Berwick, where a member was surgeon to the regiment stationed there and was allowed to have an apprentice.

In 1733 repairs to the door of the hospital are mentioned, but there is no record of this Guild running a hospital.

On May 20, 1773, a petition was sent to the governors of the infirmary asking that all practising surgeons be allowed to attend the meetings of the physicians and surgeons. There is no note saying whether this was granted.

In the latter part of the eighteenth century the importance of the Barber Surgeons Company declined owing to the growth of hospitals and medical schools in Newcastle, and as it no longer engaged apprentices it finally ended as an active practising and teaching organization. As a historical relic it still exists: for example, in 1928 the membership was eight members and two stewards (indicating the original division into barbers and surgeons). The yearly meeting still took place on Trinity Monday in the Nag's Head Hotel, but there was no dinner, only a small sum being spent on liquid refreshment and tobacco. At the present time there are fifteen members with two stewards, and two new members are to be elected soon. As no apprentices are now taken, only sons of members can become Freemen.

Treatment of the Sick Poor in Early Times

Before considering the various institutions which figure so largely in the medical history of Newcastle, we must look at the methods of treatment of the sick poor before their foundation. From early times the town provided and paid for treatment of some types of case, but it was not until 1592 that records were available in the Minutes of the Common Council of Newcastle Corporation. From that time irregular payments were made to medical men for treatment in individual cases when called in by the mayor.

In 1599 a town physician was added to the corporation staff at a salary of £40 a year, soon being reduced to £20. This post seems to have come to an end soon after 1700; but Mr. John Fife, a surgeon to the Royal Victoria Infirmary, is mentioned as receiving a payment for attending a case in the city gaol in the nineteenth century.

The town physician had to be careful, diligent, and observant, and was not allowed to leave the town without the permission of the mayor. He had to visit the inmates of the Holy Jesus Hospital when required, and latterly the gaol and places of correction.

Another way in which the public in the eighteenth and early nineteenth centuries, and before, obtained treatment was by itinerant qualified and non-qualified practitioners who in part followed the various markets and fairs, and in part attended certain towns on dates following advertisements in the local press. Many of these specialized in the treatment of certain conditions—for example, manipulation for deformities such as wryneck, and certain other organs, especially diseases of the eye. Others sold medicines, frequently from public houses, which were claimed to cure a wide range of diseases.

I now depend on the history of the institutions, medical societies, and the press for the ensuing period.

The Royal Victoria Infirmary

The history of the infirmary is probably the greatest single source of knowledge of medicine and surgery, and of those who practised these arts, in this area. We are fortunate in having had the late Mr. G. H. Hume, and his son, Sir William Hume, consultants to the infirmary, as its able historians up to the bicentenary of the institution celebrated in 1951.

In the middle years of the eighteenth century the industrial revolution was advancing with great strides. The population was increasing rapidly; great wealth was accumulating; and alongside of this there was an extension of philanthropy, especially that associated with personal donors. This was a time when hospitals were being built in all the large industrial centres, Bristol being the first in 1735.

The idea of founding the infirmary has been credited to a small social club that was to be dissolved owing to lack of support. The project was brought to the notice of the public in a letter to the *Newcastle Courant* signed with the initials B. K.; the author remained anonymous, but is supposed to have been Mr. Richard Lambert, one of the first surgeons appointed to the infirmary. A subscription list was opened and a site obtained from the Newcastle corporation on the Forth Banks, west of the present railway station. So great was the enthusiasm that the subscribers were unable to wait for a suitable building, and a house was taken in Gallowgate which could hold 23 patients. The beds filled so rapidly that a house next door was rented, the accommodation thus being increased to 35. Four surgeons and two physicians were appointed to attend on a two-monthly rota. An apothecary was also appointed on October 6, 1751, as house officer.

The hospital was governed by a committee, twelve members each from Durham, Newcastle, and Northumberland, and admission was by letter from a contributor. There is a Minute of 1751 recording the removal of a stone weighing 2 oz. from a patient, the operation being performed by either Mr. Hellowell or Mr. Lambert. In the first year 167 in-patients and 178 out-patients were treated. The building on the Forth Banks was ready for occupation on October 8, 1753; there was no opening ceremony. In the early days the total number of beds was 90, with a resident apothecary. A matron was appointed who employed the nurses at £4 a year; however, for the most part, the patients nursed each other. The staff attended on a Thursday to examine patients who had letters, and as there was only one consulting-room some inconvenience must have been experienced when more than one member of the staff attended.

Relations between the staff and patients seem to have been good, but there are Minutes relating to the drunken habits of the patients, the poor quality of the beer brewed by the hospital, and an altercation between physicians and surgeons on whose right it was to prescribe medicines: the surgeons won their case. No records of diseases of patients were kept.

By the end of the century overcrowding was excessive owing to the growth of the population. As a result of constant pressure on the governors by the medical staff, it was decided to alter the rules and to increase the accommodation. One of the new rules enjoined strict temperance on the medical staff. New beds were added, of which 12 were set aside for fevers. This last provision caused a split among the medical staff—that is, between those for and those against admitting fever patients.

Call for Reconstruction

A special meeting of the subscribing governors finally decided that the beds should be used for fever cases unless other accommodation was provided. The opponents immediately procured a site and built a separate fever hospital. The new infirmary wards were small (seven beds each) and were built on to the west side of the hospital. The ground-floor wards of the old building were converted into consulting-rooms, library, and museum: so the net increase in beds was only 30. This addition was opened in 1803.

In spite of the reconstruction and the later, 1830, addition of the third story to the old east wing, the position was still unsatisfactory. It is probable that one of the factors which influenced the medical staff to press again for further alterations at this time was the severe cholera epidemic of 1831–2, when deaths rose to over one hundred a day during the peak period in September. The City Council

at that time took action by clearing out the worst overcrowding in the slums, people being accommodated in church halls and tents on the Town Moor. The only records of the activities of the medical profession during this epidemic are a meeting in 1831 called to ensure efficient attendance on the sick poor and a vote of thanks to the profession recorded in the Common Council Minutes.

Overcrowding, leading to infection and hospital gangrene, still remained a problem, and the governors were again pressed by the medical staff to increase the number of beds and to modernize the existing accommodation. Mr. Greenhow, Mr. C. J. Gibb (brother of the better-known surgeon and physician, Dr. J. Gibb, of Blaydon Races fame), and Mr. Dobson, after a tour of investigation of London and provincial hospitals, were the chief of those applying the pressure, which was finally successful. In 1851 a new block was added to the east wing; this increased the accommodation by about one hundred beds, and at the same time part of the east wing was converted into offices, consulting-rooms, etc. It is fortunate that some increase in accommodation had been provided, for soon after the new beds became available an explosion and fire in Gateshead sent 123 victims into the infirmary in twenty-four hours.

Severe wound and other infections, and hospital gangrene, remained the principal problems, but the time was soon to come when Listerian principles were introduced, partly due to the initiative of a house-surgeon, Dr. Beatson, who had been house-surgeon to Lister. This changed the scene completely; and incidentally saved the hospital money in linseed poultices but cost it more in antiseptic dressings. During the next few years alterations and improvements came not only in accommodation (though 50 beds were added in a separate wooden block) but also in personnel. In 1868 there were only 13 nurses to look after 175 patients, and this was soon remedied. Also, additional staff was appointed—four assistant surgeons and two house-physicians and four house-surgeons, the latter superseding the unqualified clinical assistants who had acted as residents up to that time. About this period the system of admission by letter was abolished, and any sick poor became eligible. The development of workmen's contributions also improved the financial state of the hospital.

It must be realized that before this time the infirmary was outside the city walls in a rural setting: indeed, a house committee minute records a house-surgeon being rebuked for firing a gun at partridges and rabbits near the hospital.

The Present Building

The time was fast approaching when industry, and especially the railway, were to encroach too closely on the privacy of the hospital, and it became increasingly obvious that a new and larger hospital was needed. In 1896 the Diamond Jubilee of Queen Victoria's reign was approaching, and it was suggested to the then lord mayor, Sir Riley Lord, that a new and larger hospital on a site away from noise and pollution would be a fitting local memorial of her reign. This suggestion was received with enthusiasm. By 1901 £250,000 had been raised largely owing to munificent gifts from the second Lord Armstrong and Mr. John Hall.

The new infirmary on the Leazes site was opened by King Edward VII in July, 1906, and when it was occupied in September of the same year it was as up to date as possible in the terms of hospital architecture of fifty years ago. I do not propose to describe it, as it can be seen by all essentially as it was built.

During the war of 1914–18 two wooden wards and the Ministry of Pensions Hospital on the north side were added, the Pensions Hospital subsequently being converted into the Leazes Hospital for paying patients, and later partly into general surgical and ophthalmic wards.

Between the wars knowledge of disease and its treatment grew rapidly, with consequent increase in specialization. Unfortunately, the Royal Victoria Infirmary could not provide accommodation for all surgical special units, but a new

orthopaedic block was built in 1933, the only contribution of the infirmary to those rapidly advancing specialties separated off from general surgery. Demand for more accommodation led to appeals for money on two occasions after 1918, the second appeal being cut short by the outbreak of the war of 1939-45. However, some improvements were made: two extra wards on top of the west wards, a new wing to the nurses' home, and new resident quarters.

Owing to the intervention of the war a plan to amalgamate the Maternity Hospital, the Eye Hospital, the Children's Hospital, and the Ear, Nose and Throat Hospital in new buildings on the Leazes site had to be abandoned, but this did not prevent accommodation being provided for the professor of child health when the chair was created by the University in 1942. After the war accommodation was provided for other full-time chairs in psychological medicine, anaesthesia, and industrial health; since 1945 there have been built new pathological and bacteriological departments and a new x-ray diagnostic department, with extensive modernization of wards, operating theatres, and ancillary departments.

Many plans have been laid for the time when the financial position will allow their development, but I fear few present members of the staff will benefit, though I hope we may live to see them accomplished.

Newcastle General Hospital

We must now consider some of the other hospitals, and I am afraid that in dealing with these I can only be brief. The Union Workhouse Hospital, later called the Newcastle General Hospital, was built in 1838, and remained for many years a Poor Law hospital with inadequate accommodation, despite the fact that many acute cases received treatment there. Early in this century a special block was built to accommodate acute mental cases.

After the war of 1914-18 the medical superintendent induced the guardians to appoint a consultant physician and consultant surgeon. An operating theatre was built and surgical and medical beds for acute cases were allocated. Since then there has been a rapid increase in all departments of active medicine and surgery, culminating in the great hospital of to-day, with its modernized old buildings and palatial new departments.

After the passing of the Local Government Act of 1929 the Health Committee of the Newcastle Corporation took charge: under the then medical officer of health the general medical and surgical staff and beds were increased in number, and the first neurosurgical department in the North of England was formed and in time a separate department built; departments of genito-urinary surgery, thoracic surgery, and gynaecology were also successively developed.

Since the introduction of the National Health Service many structural improvements have been made, and the medical staff has increased in strength. Among the modern new departments built I would mention the combined blood transfusion and pathological department to serve the whole of the Newcastle region, also the department of radiotherapy, housing one of the four linear accelerator machines in England.

The hospital at present carries out most of the post-graduate and some undergraduate teaching, and no doubt in the future will be, and should be, fully integrated with the teaching hospital.

Princess Mary Maternity Hospital

Another hospital catering for special types of case needs special mention. The Newcastle upon Tyne Lying-in Hospital, now called the Princess Mary Maternity Hospital, was started in Rosemary Lane in 1760, under the charge of a member of the staff of the infirmary. It remained at that address for sixty-five years, and admitted about 50 patients a year into its 12 beds. About the same time a charity for the relief of poor women lying-in at their own homes was also started, and the two amalgamated in 1858.

Prior to that, as the result of a fund started by a Dr. Elliott, and known by his name, a new and larger maternity hospital was opened in 1826 in New Bridge Street. This hospital catered for the teaching of pupil midwives and medical students, and remained as the principal maternity hospital until 1923, when it was transferred to an industrial school which had been reconstructed in Jubilee Road. This building was opened by the Princess Royal, who graciously conferred her own name upon the hospital. In 1939, owing to the risk of bombing, the hospital was transferred to the Northern Counties Orphanage on the Great North Road, which had been bought by King's College for use as a hostel. After the war this building was completely reconstructed to produce a thoroughly modern maternity hospital with isolation wing and fully equipped operating theatres.

The hospital has had a long association with the University of Durham as the centre of obstetric teaching, and in 1944 it was linked with the Royal Victoria Infirmary, becoming, on the implementation of the Health Act, part of the Royal Victoria Infirmary, and is very closely associated with the department of child health.

The Eye Hospital

The Eye Hospital was first opened in 1822 in Brunswick Place, off Northumberland Street, but was soon transferred to Prudhoe Street. In 1884 a new hospital in St. Mary's Place was opened by the then Duke of Northumberland. It had 25 beds and was at that time equipped for all the most modern methods of investigation and treatment. Since then, advances in ophthalmology have been accompanied by necessary adaptations of the hospital, which was taken over by the Regional Hospital Board in 1948, and continued to function until 1956, when it was closed, as it stood on the route of a new by-pass road.

Accommodation for the patients has been provided in the Newcastle General Hospital and Walkergate Hospital until such time as a new ophthalmic unit is built, probably in association with the teaching hospital, on the Leazes site.

Fleming Memorial Hospital for Sick Children

The Fleming Memorial Hospital for Sick Children was built by Mr. John Fleming in memory of his wife, and replaced an older hospital started in Hanover Square in 1862. The new site, facing the Town Moor near the Orphan Asylum, was opened by Lady Armstrong in September, 1896. A then modern hospital of 130 beds with quite extensive grounds, it was associated in the teaching of diseases of children with the College of Medicine from 1906 until the opening of the child health department in 1946. A move has now been made to renew this association. The hospital has always attracted young surgeons interested in the surgical diseases of babies and children, before and during their early days on the staff of the teaching hospital. At least four men who became professors of surgery in the University spent part of their time on the staff of the Children's Hospital—Messrs. Page, Hume, Pybus, and Barclay. It has recently undergone extensive alterations, providing a burns unit and modern cubicles for the treatment of sick and premature babies.

Walkergate Hospital for Infectious Diseases

Separate accommodation for infectious diseases had been in the minds of many since the great cholera epidemic of 1831, when patients were housed in temporary buildings outside the walls of the city at Spital Tongues and on the Town Moor; also, cases were transferred from slums to Church Halls, Trinity House, etc., and treated and isolated there. In 1793 it was suggested that fever wards be opened in connexion with the infirmary, but a separate hospital was decided on, with the result that the old Fever Hospital in Bath Lane was opened in 1784, and continued to occupy that site until 1888, when, as Newcastle was expanding rapidly and the old site was considered unsafe in these

overcrowded conditions, Walkergate was chosen as the new site and the hospital of 105 beds was built on the pavilion system. Special arrangements were made for the disposal of sewage. The hospital was under the control of the medical officer of health in Newcastle, and soon became the major institution for the treatment of infectious diseases in the North, taking cases from outside its boundaries and becoming associated with the College of Medicine for the instruction of medical students in fevers and the qualified practitioners taking the D.P.H. or B.Hy. course. After the war of 1914-18 further pavilions, and an operating theatre for infectious surgical emergencies, were added. Later, wards were set aside for the treatment of cases of open tuberculosis.

With the diminishing incidence of infectious cases the Walkergate Hospital for Infectious Diseases has since the end of the recent war been developed as a general hospital connected with the Newcastle upon Tyne General Hospital. A new operating theatre has been built for ear, nose, and throat work; part of the Eye Hospital has been transferred here; and the wards are largely used for the treatment of acute medical cases of all types.

Newcastle upon Tyne Dispensary

The Newcastle upon Tyne Dispensary was started in 1777 by the efforts of members of the infirmary staff of that period, with the object that all, especially out-patients, who needed medical care should be able to receive it. Casuals were attended on application, but any who seemed likely to remain on the list for any length of time had to obtain a letter from a contributor. Starting in Pilgrim Street in cramped quarters and with financial problems, it migrated to Low Friar Street, Nelson Street, and finally to New Bridge Street. It fairly soon lost its association with the infirmary, and in the end was staffed with a full-time house-physician helped by general practitioners in the city. Under the National Health Service its old function has ended, and after some reconstruction it remains in service as an out-patient chest clinic.

Of the other hospitals in the city, only the Ear, Nose and Throat Hospital, which started in 1878, retains its old function under the Regional Hospital Board, in premises at the lower end of Rye Hill which have been partly reconstructed.

Other hospitals such as those for women, diseases of the skin and chest, have failed to survive.

The Medical School

Many of you will have graduated at the Medical School in this town, and its origin and subsequent development should be of interest and certainly throw some light on the history of medicine in this area.

The position of medical men in the early nineteenth century must be appreciated. They were divided into two groups: first, the physicians who had studied medicine at one of the recognized universities in England, Scotland, or Europe, and obtained a degree; and second, and by far the larger group, the apothecaries and surgeons who had obtained their medical knowledge and licence to practise by apprenticeship for five to seven years, and paid sums of about one hundred guineas or more. Some of these did go on and spend a period at a university at home or abroad and obtain a degree. Also licences could be obtained by attending a hospital, where the house-surgeon was usually entitled to have so many students as apprentices.

This position continued until the passing of the Medical Act of 1858.

There is no doubt that lectures had been given at various places, such as the Barber Surgeons' Hall and the Literary and Philosophical Society Building since 1786.

The originator of the idea of a centre of medical education was a Dr. T. M. Greenhow, who read a paper on this subject at the Literary and Philosophical Society in 1831.

After this a committee was formed on which were Dr. Greenhow and Mr. John Fife, both members of the infirmary staff. This committee drew up plans and a prospectus for a medical school. The necessary public support, however, was not forthcoming, and the plan fell through. Following this, a group of medical practitioners in the town, of which Mr. Fife was the leader, started in a more modest way, taking rooms in Bell's Court, in Pilgrim Street, and gave the first course of instruction during the winter session of 1832. The names of the eight students who took that course are known.

This starting of the school in a small way by a band of practical men instead of by the more ambitious scheme was a success, and larger and more convenient premises were soon an urgent necessity. These were obtained in 1833 by renting for a year the vacant Barber Surgeons' Hall in the Manors. This was extensively altered, a lecture room and dissecting-room were added, and in 1834 the first properly advertised course of lectures and demonstrations was given. There is no doubt that this is the real date of the beginning of the school. All certificates are headed with this date, and the book for registration of students starts then.

In spite of all difficulties, financial, jealousy of the older members of the profession, and the prejudice of the public against dissection, the school flourished, and regular courses of lectures and demonstrations on chemistry and botany and all the divisions of medicine were given. The school was recognized by the Royal College of Surgeons as a licensing body, and the number of students increased.

Names later famous in this area appear among the lecturers. Dr. D. Embleton, Dr. G. Y. Heath, and Dr. J. Gibb were all on the staff before the year 1851. The lecturers, who paid £40 for the privilege of giving lectures, had to make their living outside, and no doubt hoped that their position in the school would give them added prestige. There seems to have been no controlling body and no accounts were published, and there is little doubt that this lack of control contributed to the dissolution of the school in 1851. The occasion was due to Dr. Embleton, who was a Poor Law guardian, giving a vote to an old friend and colleague whereby he obtained the post of a Poor Law surgeon. This was resented by his assistant in the department of anatomy, and after several stormy meetings it was decided that the only solution was to dissolve the school. This took place in June of 1851, and as a result two schools rapidly came into being which carried on in opposition.

The news of the disruption spread rapidly and caused considerable excitement among the profession, students, and public. With the support of the students, the majority party, retaining such doctors as Embleton, Heath, Charlton, and Gibb, all ex-lecturers in the old school, formed a committee to establish a College of Medicine of Newcastle upon Tyne. The museum specimens which had been collected by the old school were housed temporarily in auction rooms in Nun Street, and many of these specimens were stolen on two separate occasions by the minority party.

The majority party, having decided to form a school, found great difficulty in obtaining accommodation, and finally had to occupy the gardener's cottage of the old Barber Surgeons' Hall and a temporary brick building beside it. In spite of these difficulties the 1851-2 course of lectures, etc., was held with twenty-four students.

It had long been the desire of the old school to become associated with the University of Durham, founded in 1832, and in spite of opposition from the minority party this objective was obtained in December of the same year, and in 1852 the newly established College of Medicine of the majority party was recognized by the Royal College of Surgeons of England.

The minority group, led by Sir John Fife, formed the opposition school called the Newcastle upon Tyne College of Medicine and Practical Science, with Sir John as the first president. They also started a course of lectures in 1851,

and were recognized by the Royal College of Surgeons of England. They were more fortunate in obtaining accommodation, as they were allowed to occupy the new Barber Surgeons' Hall in Victoria Street, Westmorland Road, which had been built by the railway company. The minority group always remained the smaller and resisted various efforts at reconciliation, in spite of their far from flourishing condition and inadequate discipline and academic supervision, but in 1858 a subcommittee of the two parties, largely influenced by Dr. T. M. Greenhow, resolved their differences, and a single strong and more efficient College of Medicine arose from the union.

The College of Medicine

It was obvious that the existing accommodation was unsuitable for a growing college, and an attempt was made to obtain a site near the infirmary, but this failed. An old mansion, Westmorland House, near the present Central Station, was bought, and temporary buildings were erected near it, the house being used as a hostel. As this was not satisfactory a new building was erected in the gardens of the house, facing Orchard Street, which remained as the home of the college for thirty years.

The succeeding period of the college was one of peaceful progress with gradual rearrangement of the regulations of licences and degrees to bring them into line with those obtaining in other universities, resulting in the recognition of these licences by all bodies in the country who employed members of the medical profession. It also saw a closer association with the University of Durham, the lecturer on medicine becoming the first professor and all lecturers teachers in the university. The first professor of medicine was Dr. Denis Embleton, whose picture hangs in the staff room of the Royal Victoria Infirmary.

Most of the lecturers of the college were also associated with the infirmary, and their work in the college was unremunerated for the greater part of this time.

One of the stumbling-blocks to students wishing to take a university degree was the regulation that an arts degree, entailing one year's study in Durham, had to be taken first. Even though the regulation was altered so that it could be taken in Newcastle, it still remained a difficulty and was abolished only in 1906.

During the later years of the century several changes took place. One was the institution of the degree of M.D. by examination for practitioners over 40, and of fifteen years' standing. This aroused a good deal of controversy, as the degree had nothing to distinguish it from the ordinary M.D., but it became a fairly popular degree, and was abolished only in 1932.

Continued increase in the number of students resulted in the building of new accommodation in 1882: a new dissecting-room, a physics laboratory, and a museum were added, with some alteration of the existing accommodation. Soon after new chairs were established by the university in surgery, physics, chemistry, anatomy, and comparative pathology.

Professor R. Howden, who was appointed to the chair of anatomy, still occupied that position when I was a student, and was noted for his accurate blackboard drawings; he had a reputation, too, for being the chief disciplinarian among the more rowdy students. Many other lecturers of this period (Professor Oliver, Professor Drummond, Professor Beattie, Professor Rutherford Morison, and Professor Hume, to mention a few) were still associated with the college after the 1914-18 war, when many of us were students.

The days of the rebuilt College School in Orchard Street were numbered, the railway company desiring the land to extend the Central Station. After considerable difficulty a new site was obtained in Northumberland Road, the eastern part of which at that time was largely undeveloped. The new college (named by those of us who trained there "the old college") was opened in 1889. This coincided with an

increase in the number of medical students, making the Newcastle College the largest provincial school in England at that time.

The chief developments following the occupation of this new building until after the 1914-18 war were the closer association with the Royal Victoria Infirmary on its new site at the Leazes, and the utilization of its staff as clinical teachers. Lecturers in the minor specialties such as eye and ear, nose, and throat were appointed, and the numerous and valuable pathological specimens in the College Museum were renovated and catalogued. After the war the college was working under great difficulties, the chief of which were the familiar lack of finance and overcrowding. A combined appeal to the public produced only enough money to purchase the site so long desired near the infirmary. The only new building possible was the department of bacteriology, which was built by the Armstrong College in their grounds and rented by the college for ten years. More or less minor improvements in staffing were all that could be attempted in the succeeding years. Difficulties of opinion on organization, staffing, and finance led to the appointment of a Royal Commission of inquiry into the organization of the university and its constituent colleges. As a result of the report of this Commission the College of Medicine was joined with Armstrong College to form the King's College, a Newcastle Division of the University of Durham with its own rector and internal administration. In 1938 a new medical school was built opposite the infirmary in Queen Victoria Road. This was opened by King George VI in 1939, and is already requiring increased accommodation.

A Flourishing Medical Society

We have a Northumberland and Durham Medical Society flourishing to-day, and it attracts quite large audiences to its meetings, now normally held in the Royal Victoria Infirmary. The precursor of the society, called the Medical and Philosophical Society, was formed in 1786 with an original membership of 22, which probably represented the majority of the medical practitioners in Newcastle at that time. Dr. Rotherham, a physician at the infirmary, was their first president. The rules of the society were drawn up at a meeting in 1786 by which meetings were to be held once a month and to last no longer than three and a half hours. If a paper was read lasting more than half an hour discussion on it was postponed until the next meeting. Various places were used for the meetings—St. Nicholas Church library, Katy and Bella's Coffee and Punch Room in the Sandhill, and later a room at the dispensary. The Minutes, as recorded by Dr. Embleton, give the names of some of the subjects discussed, such as angina, emetics, treatment of phthisis. The society also held a dinner once a year, usually held at Turner's House, in Pilgrim Street. This was later the Queen's Head Hotel, and is now the Liberal Club.

The Medical and Philosophical Society came to an end quite suddenly in 1805, the only indication in the Minutes being the decision to divide up the library among the members. The periodicals were given to a small society which was then in being called the Medical Book Club, whose chief concern seems to have been in dining and in buying books. The dinners were held in members' houses, the type of food provided being standardized. On March 25, 1834, a general meeting of practitioners was held in the library of the Literary and Philosophical Society, and a new society was formed consisting largely of members of the staff of the infirmary, and was called the Society of Physicians and Surgeons of Newcastle. Their Minutes up to 1846 record interesting discussions on various scientific subjects, but after that date interest waned and the society became defunct. It was followed by the Newcastle and Gateshead Pathological Society, covering much the same ground as the present society, but taking a definite part in advising the City Council on various health problems of the town. In 1860 this society changed its name to the present title, and, though times and type of meeting have altered, it has fulfilled its essential purpose to the present

time—that of presenting occasional interesting and instructive papers and cases to any practitioners in the North of England who have time to attend their meetings.

Conclusion

The history of surgery in Newcastle upon Tyne is probably similar to that of other cities, a rather slow progression until the two major discoveries of the nineteenth century. The first was the introduction of anaesthesia, which must have gone a long way to allay the patient's fear of an operation and make the surgeon's task immeasurably easier. The second was Lord Lister's discovery of the cause of sepsis, the application of his principles lowering the morbidity and mortality and enabling the surgeon to explore with safety all the body cavities.

Surgery progressed along these lines until the last war, when major improvements in anaesthesia and resuscitation, helped by the discovery of antibiotics and sulphonamides, made possible the spectacular advances in surgical operations as performed to-day. What will be the future I hesitate to forecast, but successful temporary or permanent replacement of vital organs seems to be an attainment which would give maximum benefit to mankind.

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SAFETY AND ANTIGENIC POTENCY TESTING OF POLIOMYELITIS VACCINE

A REPORT FROM THE BIOLOGICAL STANDARDS
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The British poliomyelitis vaccine is prepared by the formalin-inactivation method introduced by Salk (1953) but differs in its type I component from that produced in North America. The Mahoney strain has been replaced by the partially attenuated variant of the Brunhilde strain (Enders *et al.*, 1952; Sabin, 1955a), which Gear (1956) has called "Brunenders." As in America, strains MEF-1 and Saukett are used in preparing the type II and III components of the British vaccine. Free formaldehyde is neutralized by sodium metabisulphite after virus has been inactivated, and merthiolate and versene are then added as preservatives.

The general regulations for the testing of the British vaccine have been laid down in the T.S. Amendment Regulations No. 1131 (1956), and are based on the present American ones, which are fully described in the Minimum Requirements for Poliomyelitis Vaccine issued by the U.S. Public Health Service (1956). As the British regulations are only a guide to the procedures to be adopted, those used by the Biological Standards Control Laboratory are described. The introduction of an attenuated strain in this country has necessitated some modification of the American methods of testing.

*Scientific staff engaged in the testing of poliomyelitis vaccine: Dr. D. G. Evans (Head of Control Laboratory), Dr. T. S. L. Beswick, Dr. C. R. Coid, Miss A. J. Ferguson, Dr. F. T. Perkins, Miss A. Petts, Mrs. K. Russell, Dr. J. O'H. Tobin, and Miss R. Yetts.

In Britain concurrent tests are made on each batch of trivalent vaccine by the control laboratory and the manufacturer, after the latter has shown that the tests for safety and potency on the individual type components are satisfactory. In the final tests the vaccine is examined for the presence of live virus by the inoculation of cell cultures and monkeys, and for its antigenic activity in monkeys.

Safety Test in Cell Cultures

Vaccine Sample.—Three and a half litres of each batch of formalinized vaccine, neutralized by sodium metabisulphite, but without preservatives, are obtained from the manufacturer in half-litre "pyrex" blood-transfusion bottles. The vaccine is dialysed in 500-ml. quantities, first against 5 litres of Hanks solution for 24 hours and then against 5 litres of Parker 199 solution for a similar period; both stages are carried out at $+4^{\circ}$ C. (Fig. 1). Bovine albumin (Armour Fraction V) is added to the dialysed vaccine to a concentration of 0.14% immediately before it is tested in cell cultures.

Cell Cultures

Trypsinized monkey - kidney - cell cultures are used. Kidneys are removed aseptically from rhesus monkeys and, after mincing with scissors and washing in Hanks solution, are agitated in a 0.2% solution of "difco" trypsin in buffered saline. The supernatant fluid containing the released cells is removed at intervals of 10 to 20 minutes and replaced by an equal volume of fresh trypsin solution. The cell suspension is washed twice with Hanks solution by centrifugation and the deposit diluted to a concentration of from 300,000 to 400,000 cells per ml. in 199 solution containing antibiotics, 0.09% sodium bicarbonate, and 5% horse serum free from polio-virus inhibitors. This suspension is then distributed in 10-ml. quantities into hexagonal pyrex feeding-bottles which are sealed with "esco" white rubber bungs. The bottles are incubated horizontally at 37° C., until confluent cell sheets are formed. The cell sheet in each bottle covers an area of approximately 30 sq. cm. and is usually complete five to seven days after seeding; bottles with incomplete sheets after this time are not used. Approximately 100 bottles are prepared from the kidneys of one monkey. In preparing these cell cultures the kidneys of each animal are treated separately and not pooled with those from other monkeys.

FIG. 1.—Dialysis of vaccine. Vaccine is passed into the dialysis bag through tube A, and after dialysis is siphoned out through B. Dialysing fluids changed through C.

The Test

A minimum of 2 litres of dialysed vaccine is tested for the presence of live polio virus, using three or four different batches of cell cultures. The old medium is first removed from each bottle culture, which is then washed with 10 ml. of Hanks solution. The bottles are inoculated with 10 ml. of undiluted freshly dialysed vaccine to which 0.14% bovine albumin has been added. They are incubated at 37° C. for a total period of 21 days, during which time the cultures are examined microscopically twice weekly for cytopathic changes. Three days after the addition of vaccine, 10 ml.