

ORIGINAL COMMUNICATIONS.

INTRODUCTORY ADDRESS TO THE CLASS OF ANATOMY
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It is customary, when a Professor takes formal possession of his Chair, that he should give what is termed an Introductory Lecture. The history of the subject he is called upon to teach constitutes on such occasions a very favourite theme; but, while I do not propose to omit such a topic altogether, I purpose dealing with it shortly, and only in such a manner as to lead up to what I have to say regarding the institution of anatomical teaching in Edinburgh. It will not be possible, therefore, to give a continuous story of the history of Anatomy. I shall rather try to present one or two more or less isolated pictures, and let these speak for themselves as to the condition of the subject in particular periods. I remember the vivid impression produced at the Octo-centenary Celebration of the University of Bologna, by the method which was adopted by the students in depicting certain notable events in the history of their great School. The leading episodes were represented by a series of *tableaux vivants*, and those who took part in the display were not discouraged by the difficulties surrounding such a subject as Galvani, his wife engaged in culinary efforts, and the twitching of the legs of the immortal frog. Such a treatment of the history of Anatomy on the present occasion would, I feel sure, be much more popular than the more formal method which is imposed upon us by prescribed custom.

The decline and subsequent overthrow of the Roman Empire ushered in a period which is generally termed the Dark Ages. Learning gradually decreased, and Europe sank into the utter darkness of ignorance and superstition.

“One vast eclipse the human mind o’erspread,
And learning slumbered with the mighty dead.”

This neglect of Science was the direct result of the unrest produced by the struggle which was being carried on between the southern and northern peoples of Europe. The Romans were fighting for their existence, and when ultimately their empire was overrun by barbarous hordes, all efforts at scientific improvement ceased. Another adverse influence contributed to perpetuate a state of affairs initiated through bloodshed and

strife. The tyranny of the Church stifled with a strong hand all freedom of thought, and an intolerant and bigoted priesthood, rendered powerful through the ignorance and superstition of the people, would allow no one to look at nature except through the spectacles which it itself supplied.

Towards the close of the fifteenth and in the early part of the sixteenth centuries a great awakening had taken place, and activity was being shown in almost every branch of study. Up to this time and all through the Dark Ages the only Anatomy known and taught, except in the case of two or three Italian teachers much in advance of their time, and attached to the early School of Bologna, was the Anatomy as set forth in the works of Galen, already then more than a thousand years old.

About this time, Jacques Dubois, more commonly known by his Latin name of Jacobus Sylvius, was the Professor of Anatomy in Paris, and one of the most noted teachers of the period. His name is preserved in our anatomy books in the term applied to one of the most important fissures on the surface of the cerebrum.

Let us endeavour to picture his method of teaching. His attitude of mind towards the subject he taught was peculiar. He would have thought it derogatory to his dignity to soil his hands by taking part in the actual dissection. He considered that his duty was amply fulfilled by reading a discourse from Galen to the assembled students, and probably also by making a running commentary thereon. At these public demonstrations it was usually the dog which was dissected; only at rare intervals was the anatomy of the human body displayed. While the Professor was giving his discourse, the various structures referred to were rudely and imperfectly exposed by the barbers who acted as attendants, and you may judge of the coarseness of the dissection when I tell you that the implement they usually employed was the razor.

It was to this School, conducted in this way, that a young Belgian, attracted by the reputation of Sylvius, came. He had a passionate love for Anatomy, and already as a boy in Louvain he had made himself acquainted with the anatomy of the dog. To Vesalius, who had been in the habit of making his own dissections, the clumsy and ignorant efforts of the barbers were unendurable, and, pushing them aside, he began to display the parts referred to by Sylvius. As he expresses it himself, "I had to put my own hand to the business."

These were indeed trying, and I might almost say perilous, times for the anatomist who above all things desired to improve himself in his special branch of study. Vesalius was bold even to rashness in his pursuit of knowledge. He robbed the gibbet, where, as he quaintly remarks, "to the great convenience of the studious, the bodies of those condemned to death were exposed

to public view," and it is even stated that he had to carry on his dissections in his bedchamber. Well might he remark that he who has adopted Science as his mistress must not take unto himself a wife, as he could not be faithful to both.

In 1537, Vesalius went to Venice, and very shortly afterwards, when barely twenty-two years old, he was appointed a Professor in the University of Padua, and began his work as a teacher of Anatomy.

Soon discarding completely the old Galenic traditions, he infused such life and originality into his teaching that a class of five hundred attended his demonstrations. But besides teaching, he was continuously, and with infinite labour and care, giving shape to the new Anatomy in the pages of his great work, entitled *The Structure of the Human Body*. Five years after his appointment in the Padua School this book was ready for publication, and in 1543 it was issued from the press. From this date the history of Modern Anatomy may be said to commence.

Vesalius demonstrated in the clearest manner that the Anatomy of Galen, which was being applied at that period to the human subject, was, in a great measure, not the anatomy of man, but the anatomy of the monkey. Such an audacious assault on constituted authority could not be allowed to pass unchallenged. He was consequently attacked in the most virulent manner, and foremost amongst his opponents was his old master, Sylvius. In the encounter which ensued, notwithstanding the abuse and calumnies he heaped on Vesalius, Sylvius got very much the worst of it. And when at last Sylvius was forced to admit that some of the statements of Galen did not correspond with what was found in the human subject, he covered his retreat by insisting that in the fourteen centuries that had elapsed the structure of man had changed, and not for the better. He thus proclaimed himself an evolutionist, but it was deterioration and not improvement that he saw, although the standard of excellence set up by Sylvius was Galen's description of the ape.

There cannot be a doubt that Vesalius is one of the most interesting figures of the sixteenth century. With Copernicus and Galileo he shares the glory of breaking through the fetters which bound the earlier scholars, and placing scientific study in the freer air of original research.

To Italy more than any country is due the credit of the revival of learning, and from the twelfth century onwards students thronged from every part of Europe to its schools, and more especially to Bologna. In consideration of this, and of the fact that the common language employed in writing and teaching was Latin, well might Carducci in a striking address exclaim—

"O Italy, beloved country! in the miseries of thy bondage thou didst delight in imagining the eagles of victory again flying forth from the Seven Hills over all nations; but, perchance, thy

true glory, thy noblest revenge, were to be sought for at Bologna, where, with the tongue of the ancient empire, thou didst proclaim to the very nations who had oppressed thee the new gospel of civilisation, and didst teach them to throw off the yoke of barbarism and again become Roman!"¹

When Vesalius was in Padua, an Englishman called Caius lived for eight months in the same house with him as a fellow-lodger. Caius, who was some years his senior, had been educated at Gonville College, Cambridge, and had come to Padua as Professor of the Greek language.² His association with Vesalius seems to have turned his mind into other channels, because he forsook his classical studies and devoted himself heart and soul to the acquisition of anatomical and medical knowledge. In little more than a year he took his degree as Doctor of Medicine; and in 1541, two years before the publication of the great work of Vesalius, he returned to England. Thus was the influence of Vesalius brought to this country.

Caius taught Anatomy in both London and Cambridge,³ and is the first teacher of the subject in England of whom we have any direct knowledge. He became the head of the college in Cambridge which bears his name to the present day—the same college which has also the proud distinction of being able to point to Harvey, the discoverer of the circulation of the blood, as one of its students.

The seventeenth century also had its great anatomist—one who stands out beyond all those who were engaged at that time in Biological Research. During the sixteenth century only the grosser or macroscopic Anatomy was possible. Only such structures as could come within the range of unaided vision could be studied. Towards the end of this century, however, the compound microscope, by which minute objects are rendered large, and the telescope, by which distant objects are brought near, were invented. By some the invention of both of these instruments is ascribed to Galileo. It is now believed that both took their origin in Holland. So far as can be ascertained, the microscope dates from 1590, when it was invented by two spectacle makers, Hans Janssen and his son Zacharie. At first rude and imperfect, and nearly two feet in length, this instrument was rapidly improved, and in the hands of Malpighi produced the most startling discoveries. The structure of the lung, and the hitherto missing link formed by the capillaries between the pulmonary arteries and the pulmonary veins, was revealed. The *terra incognita*—the unknown parenchymatous region—of the

¹ See Professor Kirkpatrick's delightful account of the Octo-centenary Celebration of the Bologna University. A translation of Carducci's Address is given in this.

² According to his own account, he lectured on Aristotle.

³ After his return to England he did not go to Cambridge till 1558; the instruction which he gave there could therefore not have been given prior to that date.

lung, into which the impure blood was seen to disappear and to emerge on the other side as arterial blood, was thus fully explored.

We need not follow the work of Malpighi, the great anatomist of the seventeenth century, further. His name is enshrined in the terminology of the subject in the stratum Malpighi of the cuticle, in the Malpighian bodies of the kidney, and in the Malpighian corpuscles of the spleen. The Royal Society of London is justly proud of the fact that the greater part of Malpighi's observations were published by it.

Sir Michael Foster, who has made a close study of Malpighi and his work, says: "It may be truly said of Malpighi that whatever part of natural knowledge he touched he left his mark; he found paths crooked and he left them straight; he found darkness and he left light. Moreover, in everything he did there is the note of the modern man, . . . when we pass to Malpighi we seem to be entering into the ways and thoughts of to-day."

Three other observers share with Malpighi the credit of opening up the great field of anatomical research to which access had been given by the construction of the compound microscope, although none went so far as he. These are the two Dutch anatomists, Leeuwenhoek and Swammerdam, and Robert Hooke of London.

During the seventeenth century, instruction in Anatomy was still given by public dissections, and it is doubtful if students were afforded, except under very exceptional circumstances, the opportunity of performing dissections themselves. Still, the whole spirit of the teaching had changed. No longer was structure required to conform to the orthodox descriptions, and no longer was the eye blind to everything which deviated from the old Galenic doctrine. Every dissection was conducted as a piece of original research, and if those who took part in the work did not gain an extensive knowledge of practical Anatomy, they at least acquired that habit of mind which it is the aim and ambition of every true teacher to inculcate and foster in his pupils—a habit of mind more precious to its possessor than any number of cut-and-dried facts, because by it he is provided with a weapon by which he can cut his way deeply into the hidden things of Nature. The seventeenth century, therefore, was most fruitful in adding to the gradually increasing store of anatomical knowledge.

In these early times the different branches of learning were not circumscribed by the high barriers which are now interposed between them, and which have been gradually raised by an ever-increasing degree of specialisation. A Professor of Greek, or of Mathematics, or of Divinity, in the dissecting-room eagerly engaged in the study of the structure of the human body is at the present

period an almost unthinkable coincidence. In the sixteenth and seventeenth centuries men pursued many very varied branches of learning, and it was no unusual occurrence for those traversing altogether different paths of study to attend and even take part in the public dissections. Servetus studied Anatomy as a theologian, and because he thought he might thereby gain a better understanding of the Deity; Caius entered upon its study while acting as a Professor of Greek in Padua; and Borelli, the associate and friend of Malpighi, pursued the study of Anatomy at Pisa with enthusiastic zeal. Incalculable benefit must have resulted from this interlacement of the different branches of learning. The bringing of cultured minds, trained in other lines of thought, to bear on the problems presented by Anatomy, could not but react most advantageously on anatomical research. Thus we find that the greatest work of Borelli—a work which engaged him during the greater part of his life, and which was not published till after his death—was *De Motu Animalium*, a treatise on animal motion.

I know of only one striking example of a similar kind in our own times. In the University of Dublin, the Rev. Dr. Haughton, already a Fellow and a Professor, and a brilliant classical and mathematical scholar, entered the Practical Anatomy Class of the College of which he was one of the heads, and, working with and alongside the students, obtained those facts which he required for the preparation of his book on *Animal Mechanics*.

It stands without saying that no efficient teaching in Medicine is possible without instruction in Anatomy. The earlier teachers were fully alive to this, and performed dissections whenever opportunity offered. During the sixteenth and seventeenth centuries, however, the study of Anatomy in England was carried on in a very fitful and desultory fashion, and in most cases unsupported by any authoritative backing. In London, six public dissections by the College of Physicians and four by the College of Surgeons in each year were officially authorised and provided for, and we further know that unauthorised dissections were by no means uncommon. In Cambridge at this period there is evidence that dissection was practised at several of the colleges—chiefly, perhaps, in Caius College, where it is not unlikely that Harvey received his first lessons on the structure of man.

In Edinburgh, matters were not so advanced. Although the Incorporation of Surgeons and Barbers obtained by its Charter of 1505 the right to hold one public dissection in the year, and although it is distinctly enjoined in that Charter that no one shall be permitted to enter the Craft who does not know the nature and complexion of every member of the body of man, it is very doubtful if even this limited right was regularly taken advantage of.

In Dublin, opportunities for the study of Anatomy in these times were still less favourable. No provision of any kind existed

for the holding of public dissections; but, notwithstanding this, records show that in the seventeenth century private dissections were by no means unusual; and further, that in certain cases soldiers were employed to facilitate the performance of these.

Such a condition of affairs could not continue. The pressing need for regular instruction in the structure of the human body began to be felt everywhere, and, as a consequence, the opening years of the eighteenth century saw Chairs of Anatomy founded in most of our Universities.

Cambridge took the lead in 1707. Three years later, a Professor of Anatomy was appointed in the University of Dublin, and in the following year (1711) an Anatomy House was erected for his use. This was the first building which was erected in any University in Great Britain and Ireland for this purpose.

It is unnecessary to dwell on the oft-told and somewhat threadbare tale of the origin and development of the Anatomy Chair in the University of Edinburgh. The steps or stages in its evolution are not so clear nor so easy to trace as in the case of Cambridge or of Dublin, because it was by the united efforts of the College of Surgeons and Apothecaries and of the Town Council, who, at that time, were the sole patrons of the University, that the end was attained.

In 1697, an anatomical theatre was built by the College of Surgeon Apothecaries, and the Town Council granted additional facilities for anatomical study. Still, the old method of imparting instruction by the holding of occasional public dissections was adhered to, and it is questionable if any great improvement was effected. For eight years no individual member of the Incorporation was specially deputed to perform these dissections. As occasion arose, and it would appear that this did not happen often, one or more of their number were selected to perform the duty.

In 1705, however, it was considered desirable to inaugurate a new system, and Mr. Robert Elliot was appointed the Public Prosector. The Town Council, who all through these early efforts to place the instruction of Anatomy on a proper footing, acted in the most enlightened manner, ratified this appointment, and voted a small salary to the new teacher. Through this act on the part of the patrons of the University, it is held that Robert Elliot, although teaching in the theatre of the College of Surgeon Apothecaries, became the first Professor of Anatomy in the University of Edinburgh. In 1708, Adam Drummond was conjoined with Elliot, and when Elliot died John M'Gill was chosen by the Town Council to take his place, and with Drummond to carry on the duties of the office.

It does not appear that these changes altered the position of affairs very much. The teachers thus specially deputed to give instruction in Anatomy did not initiate any new method

of imparting a knowledge of the subject; nor, indeed, do they seem to have been remarkable for their zeal or diligence. The old system still prevailed, and apparently the demonstrations were held at rare intervals. *Monro primus*, when an apprentice to his father, sought instruction in Anatomy at this School, and he speaks of "the dissection of a human body which was showed once in two or three years by Mr. Robert Elliot and by Messrs. Drummond and M'Gill, Surgeon Apothecaries."

Technically, perhaps, we would not be warranted in withholding from these three surgeons the distinction of being the first Professors of Anatomy connected with the University of Edinburgh, but it should be clearly understood that theirs is only a titular distinction. The first real teacher and Professor of Anatomy in the Edinburgh School was Alexander *Monro primus*, who was elected to succeed Drummond and M'Gill in 1720. This date marks the beginning of the Anatomical School in this University. But *Monro* still taught in the theatre of the College of Surgeons. It was not until 1722 that he was made Professor *ad vitam aut culpam*, and not until 1725 that teaching accommodation was afforded him within the University.

Monro was an accomplished anatomist. He had carefully prepared himself for the office to which he had been elected, first in London under Cheselden, then in Paris, and lastly in Leyden, where he came under the influence of the great Boerhaave. For the first time a systematic course of lectures was given in Edinburgh, and these were illustrated by specimens and preparations, and also, no doubt, by recent dissections. Around the Chair of Anatomy other departments of medical study began to group themselves, and the great Medical School of the Edinburgh University gradually assumed form. But it is not because Anatomy was the first subject of the early curriculum to be seriously taught and studied that *Monro* receives the title of the "Founder of the Medical School." He performed no passive part in the movement. His energies were not confined to the narrow sphere of his own department. He interested himself in every new development, and he shares with George Drummond, at that time Lord Provost of Edinburgh, the credit of having carried to a successful issue a project initiated by the Royal College of Physicians, viz. the foundation of the Royal Infirmary—an institution without which the Medical School of Edinburgh would be nothing, and an institution which has been the means of conferring unspeakable benefits upon several generations of the suffering poor of Scotland.

The influences at work in the closing part of the seventeenth century and the opening years of the eighteenth century which led to the establishment of efficient anatomical teaching, not only in Edinburgh, but also, as we have seen, elsewhere, are full of interest. Marlborough was engaged in those campaigns which

added so much to the military prestige of this country. There was, consequently, an unusual demand for competent surgeons both for the army and navy. A practical training in Anatomy was for these a matter of prime importance. This no doubt had its influence in Edinburgh, but other circumstances weighed more. For a considerable part of the seventeenth century the connection between Scotland and Holland had been exceedingly close. There was much in common between the Dutch and the Covenanting Scot. It was to that country that the majority of the exiles¹ who had fled from Scotland during the troubles of the Covenanting times, had gone. It was there that William of Orange held court, and to him the eyes of the Covenanters were turned. But further, no young man training for the Church, or for a legal or medical career, considered his education complete unless he had studied at some of the Dutch Schools, and more especially at Leyden, where in the beginning of the eighteenth century Boerhaave reigned supreme—a man whose name in Edinburgh at that time was as well known as that of Paget or Jenner a few years ago. This intercourse with Holland, and the intimate acquaintance with what was being done for the advance of medical science in the great and justly famous Dutch Schools, and also in Paris, could not but give rise to aspirations in the minds of the Edinburgh physicians and surgeons to establish in their midst a school which would meet the needs of Scottish youth with medical leanings.

Perhaps another influence was also at work. It was not only to seek safety or for purposes of study that Edinburgh people went to Holland. We know that the successful consultant is the man who gathers around him a clinical class, and impresses them with his capacity to cope with disease. It is to such a man that the members of his class look for help and guidance when in later years they enter upon the practice of their profession, and meet with anxious and trying cases. The leading medical men in Edinburgh had studied under Boerhaave, and, with the influence of their revered master strong upon them, it is not surprising that numbers of their patients went to Holland to consult the great physician. It would appear that young Monro specially commended himself to Boerhaave by the number of Scottish patients he brought to him. To thoughtful men such a condition of affairs must have appeared far from satisfactory. Everything was ripe for the change, and in Monro the man appeared who was able to carry the project to a successful issue.

Three Alexander Monros in succession held the Chair of Anatomy in the University of Edinburgh. In each case it passed from father to son. Judged by the anatomical standard, Monro *secundus* was the greatest of the three. His name is familiar to every one who studies the brain in the "Foramen of Monro" and

¹ Seven thousand exiles are said to have fled from Scotland about this time.

the "Sulcus of Monro." Writing about the former, he says: "So far back as the year 1753, soon after I began the study of Anatomy, I discovered that the lateral Ventricles of the Human Brain communicate with each other, and at the same time with the middle or third Ventricle"; and certain London anatomists having expressed doubts as to the existence of this aperture, Monro, in the same treatise, publishes an attestation, signed by his five colleagues in the Medical School, to the effect that he had demonstrated it to them in the most conclusive manner. At the same time, it must be admitted that, although Monro's name is inseparably connected with the aperture, it is questionable if he were the first anatomist who was acquainted with it. There is reason to believe that, more than two hundred years before his time, it had been discovered by Constantio Varoli of Bologna.

The Sulcus of Monro, on the side wall of the third ventricle of the brain, was not known to Monro, nor, had he observed it, would he have been able at that time to attach to it the embryological interest and significance which has of late years been bestowed upon it by the labours of the eminent Professor His of Leipzig.

The reign of the Monros lasted until 1846. In that year John Goodsir succeeded Monro *tertius*. Goodsir was a man of massive intellect—one of the greatest anatomical philosophers of the age. More striking than attractive in appearance, with no brilliancy or smartness of manner as a lecturer, he exercised by his imposing personality a remarkable influence on his class. Although he lived through the stirring times which followed the publication of *The Origin of Species*, he set his face sternly against the new doctrines regarding the origin of man and man's place in nature. All the same, he was too good an anatomist and too truthful a man to deny the axiom advanced by Huxley, that there is a greater structural hiatus between the higher and lower apes than between man and the higher apes. He lived and died a teleologist, and his attitude of mind towards science may be gathered from an expression he used: "Let us have truth! God's truth in everything." If his mantle has fallen on any one of his pupils more than another, it is upon the distinguished Professor who fills the Chair of Anatomy in Glasgow that the spirit of Goodsir has largely descended.

Of my immediate predecessor in this Chair I need say little, although, indeed, I would like to say much. He is still, happily, with us, and has been recently raised to the highest executive office which it is in the power of the University to bestow. The affection and regard which his pupils and colleagues entertain for him are only equalled by the admiration which is called forth when we consider the great work he has achieved as a teacher, in the domain of original research, in the museum committed to his loving care, in the direction of the affairs of the University, and in

the General Medical Council, the chair of which he occupies with such general approbation. It is given to few men to lead so full a life.

Thousands of graduates of this University, scattered all over the world, hold the name of Turner in reverence, and many teachers of Anatomy in Great Britain and Ireland, and also in the Colonies, owe to him the training and aspirations which have gained for them the posts they now hold. One of these, with much misgiving, with a deep sense of the responsibility of the task he has undertaken, has returned to the old School to devote his life in the endeavour to carry on as best he can the duties of the Chair which Sir William Turner has so honourably held during the last thirty-six years.

And now let us devote what time remains to the consideration of some general points in connection with the subject which it is my duty to teach from this Chair.

Anatomy may be studied from several different points of view; but in a School such as this, the primary object of which is the training and education of the medical student, it is that aspect of Anatomy which prepares the physician to grapple with disease that must ever be kept prominently in the foreground. Anatomy, Physiology, and Pathology constitute the fundamental subjects upon which all scientific medicine rests. Galen has said that it is as possible for a surgeon with no knowledge of Anatomy to operate on the body of man without error, as it is for a blind man to carve an image and make it perfect; and the appropriateness and truth of this ancient saying, now more than two thousand years old, becomes every day more apparent as the usefulness of the surgeon increases and the range of his operations expands.¹

Of late years the surgeon has made heavy demands on the anatomist. By the introduction of anæsthetics, by means of which operations may be performed without haste or hurry, and with a mind free from the distraction caused by the suffering of the patient, and by the beneficent results obtained by the application of Antiseptic Surgery, the most hidden recesses of the body are brought within the reach of the surgeon's knife. There is no part of the alimentary canal, not even the thoracic œsophagus, which he does not venture to expose; the gall bladder is forced to yield up its solid contents; the kidney is incised for the extraction of a calculus; the prostate is removed; the lung is explored; the cranial cavity is laid open for the relief of cerebral affections; tendons are transplanted; the paralysed facial nerve is grafted on to the spinal accessory or hypoglossal trunk; and the

¹ One of the greatest masters of modern surgery remarks: "A complete mastery of technique, which depends chiefly on a minute knowledge of Anatomy, is, next to a reliable antiseptic wound treatment, the condition most essential to the practice of operative surgery."

spinal cord is directly acted upon with the view of producing anæsthesia of the lower limbs.

Not one of the brilliant advances in Surgery which collectively have made the latter half of the nineteenth century so remarkable, has been carried out without necessitating a most careful revision of the anatomy of the region involved; and many surrounding conditions which had previously been accorded a very trivial and passing notice, have in this way been forced on the attention of the anatomist. Just consider the intimate practical acquaintance with the anatomy of the abdomen which is required in carrying out an anastomosis between the second part of the duodenum and the stomach—an operation practised with such good results by the great Swiss surgeon Kocher. It is not a mere knowledge of the lie of the viscera and vessels that will ensure the success of this procedure; it is also requisite that the operator should know in minute detail the intricate relations of the peritoneum, the foldings of which not so long ago were regarded as a useless burden on the memory.

Take another example. At the present moment the method which should be adopted for the removal of the prostate, whether indeed it should be approached from above or below, constitutes a burning question. Still, I think I may safely say that the points at issue are entirely anatomical, and it is upon these alone that the final selection of the safest and most satisfactory route will be decided.

But it must not be supposed from what I have said, that the anatomist in his topographical work has been following blindly at the heels of the surgeon, like a captive at the chariot-wheel of the victor. Much good work has, no doubt, been done in this way, and it is evident that when the surgeon indicates a desire for more minute knowledge in the anatomy of a particular region, it is the duty of the anatomist to exert himself to the utmost to supply it, and to arrange his department so that it may be utilised for this purpose. Still, in many cases the surgeon, when he sees a possible opening for advance, finds the way already prepared for him, in so far as the anatomy of the region is concerned. Thus it was in the case of the brain. No sooner was the convoluntary pattern of the surface of the cerebrum fairly made out, than the anatomist began to transfer this pattern to the surface of the head. One of the first to undertake this task was Sir William Turner, and the work which he did in this direction has become classical.

But not merely the surface of the brain has been dealt with in this way. More recently the deeper regions, or, as it has been very aptly called, the *Hinterland* of the brain, has had its relations to the surface of the head defined. A distinguished pupil of our great master, Professor Symington, is well to the front in this work, and, among several others, Professor Fraser of Dublin

deserves honourable mention for important research in the same field. Further, it seems to me that the work which Professor Birmingham has lately done on the rectum may be placed in the same category. The surgeon did not make any special call for it, and yet I am satisfied that it will exercise (if indeed it has not already done so) an important influence on the operative procedure known as the trans-sacral excision of the rectum.

And yet we hear it every now and then asserted by some foolish persons, that topographical Anatomy is a field of study which is completely worked out, and that within its domain no further advance is to be expected—or, indeed, is possible. So far from this being the case, our ideas in regard to this branch of Anatomy have during the last thirty or forty years undergone a complete revolution.

It is not so long ago that the anatomist derived all his information in regard to the topography of the different parts of the body from dissection alone. No other method was followed; and when, as in those times, it was not combined with measures for the preservation of the form of the parts under observation, the amount of information it yielded was limited, and not infrequently misleading.

Sections of the frozen body introduced by Pirogoff, carried out to such perfection by Braune, and now practised by teachers all over the world, led to a great advance in every department of topographical work. It then became possible to check the results obtained by dissection, and correct many erroneous impressions for which the latter method was responsible.

The next step was taken by Professor His of Leipzig, who hardened the viscera *in situ* by prolonged injection of chromic salts, and it is not too much to say that the models which he prepared, and which are at present used wherever Anatomy is practised, have had a profound effect on anatomical thought and teaching. Recently the method of Professor His has been brought to a state bordering on perfection by the use of formalin as the hardening reagent; and now we have it in our power to obtain information of the greatest precision and practical value, not only in regard to the constantly changing forms presented by both hollow and solid viscera, and the manner in which these react on each other, but also in regard to the relations presented by these organs to each other and to the body-wall. Those who read the thoughtful and suggestive Hunterian Lectures recently delivered by Dr. Arthur Keith, will see how greatly our views on matters of this kind have become enlarged, although he deals with only one branch of the subject, namely, the visceral changes which are produced by the ebb and flow of the respiratory tide.

Of late years, likewise, the marvellous penetrating properties of the Röntgen-rays have placed in our hands a most valuable

means of expanding and rendering more definite our views on many points in the bodily structure of man. The ossification and architecture of bones, the movements of the joints, the position of the heart in its systolic and diastolic states, the relations and movements of the diaphragm and of the thoracic and abdominal viscera, can all be studied with very great advantage by this method.

If I have dwelt more upon the relations of Anatomy to Surgery than to Medicine, it is not because I believe that it is of less importance to the physician, but because from its application to surgery the more striking illustrations can be drawn. It is questionable if a physician in ordinary practice could get through a single day's work without having to consider the distribution of the vagus nerve; and when it comes to the diagnosis of even the simplest disorders of the nervous system, the most profound knowledge of Anatomy may be required. In such cases it is not, as a rule, the ordinary gross or naked-eye anatomy of the brain or cord which will suffice. An acquaintance with the various fibre-paths and the centres which they connect—in short, an acquaintance with the most intricate of all the branches of topographical anatomy—becomes essential.

It is my desire to institute in the Anatomical Department of this University a course of instruction upon Applied Anatomy. The teachers of Clinical Medicine and Surgery make frequent complaints that students, when they come to the Hospital, exhibit a sad want of appreciation of those facts of Anatomy which are necessary for clinical work. I am afraid that there is a considerable amount of truth in this charge, but I believe that the defect arises more from the difficulty which a student finds in applying the knowledge he has acquired in the Anatomy School to the diagnosis and treatment of pathological conditions, than from a deficient acquaintance with the structure of the body. It is with the view of endeavouring to remedy this deficiency that I would wish to institute an Applied Class. And it also appears to me that, in connection with it, some instruction should be given on normal structure as revealed by the Röntgen-rays. This method is now universally employed, both by the surgeon and the physician, for the detection of obscure pathological and traumatic conditions; and it not infrequently happens that the interpretation of the picture on the screen, or on the photographic plate, is rendered difficult by doubts in the mind of the observer as to what is in reality the normal appearance of the part under consideration. I have even known a cervical rib, which was suspected as being the cause of a disturbance of the nervous and vascular supply of the upper limb, give rise to a considerable amount of perplexity in the mind, not only of the surgeon, but also of the anatomist, when examined by the Röntgen-rays.

Up to the present, I have merely spoken of Anatomy in its

applications to the Practice of Medicine and Surgery. This is perhaps its least alluring aspect, although to the student of Medicine it is the most essential.

It has happily, however, never been the practice in this University to present Anatomy to the student in this light alone. To do so would be to degrade it to the position of an art, and to rob it of all its many attractions. It is my desire to follow, in this matter, in the footsteps of my illustrious predecessors in this Chair; and whilst I trust that I shall never be charged with neglecting the utilitarian or practical side of Anatomy, I look forward to being able to enliven and lighten its study by frequent reference to morphological problems.

"The question of questions for mankind," remarks Huxley, "the problem which underlies all others, and is more deeply interesting than any other, is the ascertainment of the place which man occupies in nature, and his relation to the Universe of things." This is a question which is ever present in the mind of the thoughtful anatomist.

The structure and development of man, the different physical characters presented by different races—both modern and prehistoric—the comparison of man with the lower animals, and chiefly with the anthropoid apes, are all rich in facts which bear directly on this problem, and which cannot fail to attract the attention of those engaged in anatomical study.

From the time of Aristotle, the two leading structural peculiarities of man have been recognised to be the great volume of his brain and his erect attitude. There is probably no organ in the body of man which exercises a stronger fascination on the anatomist, or which has been more assiduously studied, than the brain; and in the case of those races, the brains of which are not available, the cranium, or bony envelope of the organ, has been subjected to an equally close scrutiny. This predilection on the part of the anatomist for cerebral and cranial anatomy is a very natural one, and is easily understood when we consider that it is by the psychical manifestations which result from this great accumulation of brain matter that man is removed by so wide a gap from his nearest of kin in the animal world. It is his intellectual superiority and not his structural characteristics that give to man his isolated position in the animal kingdom.

But to those who possess a mechanical turn of mind, the process by which the body of man has become gradually reared erect, and the adaptive structural changes which have ensued from this alteration of posture, afford an extremely attractive field of study, and one which presents problems of the greatest interest and importance. To the close observer it becomes apparent that certain races are not so completely adapted, in the vertebral column, head, and limbs, to the erect attitude as others; and the question naturally arises, Are we to conclude from this that these

racess have assumed the posture characteristic of man at a later date? This is a matter which we cannot enlarge upon at present. It is too full of detail, and would take us too far afield. I have merely suggested it on the present occasion as one of the numerous side issues which tend to make Human Anatomy so fascinating to those who approach its study in a thoughtful spirit.

One word more and I am done. As a means of mental training, Anatomy must always be regarded as possessing a high value. It is more or less an exact science, and it is therefore admirably adapted for the early cultivation of those habits of observation, upon the acquisition of which your future success as medical men will depend. Further, it develops the memory and educates the hands. But to derive those benefits, you must approach its study in a proper spirit. You must enter upon its threshold with the instincts of an investigator; you must take nothing for granted until you have proved its accuracy by actual observation. The very statements of your text-books you must regard with suspicion until you have tested their veracity. Happily, Anatomy is a science in which this to a great extent can be done, and the very fact that the human body is prone to variation adds interest and life to its study.

Of one thing be assured: there is no royal road to the acquisition of anatomical knowledge. This can only be obtained by patient and diligent work in the dissecting-room. In the words of the great Vesalius, you must "put your own hand to the business."

In the preparation of the above address the following, among other writings, were consulted:—

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