Anatomy as taught in the University of Edinburgh : an introductory lecture, delivered 4th November 1867 / by William Turner.

with Professor Turner's compliments

ANATOMY

AS TAUGHT IN

THE UNIVERSITY OF EDINBURGH:

AN

INTRODUCTORY LECTURE,

DELIVERED 4TH NOVEMBER 1867.

BY

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EDINBURGH: MACLACHLAN AND STEWART,

BOOKSELLERS TO THE UNIVERSITY.

LONDON: ROBERT HARDWICKE, PICCADILLY.

1867.

Gentlemen,

It is a time-honoured custom in this University, that, when a Professor commences to deliver his first systematic course of lectures, instead of plunging at once into the details of his subject, he should occupy the attention of his audience, on his first appearance, with some observations of a general character.

In conformity with this custom I propose to ask your attention to some remarks on the general scope of the science of Anatomy, and on the relations of its various departments to each other; so that you may be able to estimate the extent and boundaries of the science, its affinities to the other organic sciences, its place and value in medical education, and the position which it occupies in the system of instruction pursued in this University.

The science of Anatomy holds a well-defined and long recognised place amongst the Biological Sciences. Its province is to determine the form and structure of organized bodies, *i.e.*, of bodies which either are or have been living, whether plants or animals; but in the more restricted sense in which it is customarily employed, and in which we use it here, it is confined to the elucidation of the form and structure of the bodies of Man and Animals.

It embraces the appearance, form, position, relations, and intimate structure of the various parts, organs, and textures of which a human or animal body is composed, and the consideration of the mode in which their constituent parts are put together so as to constitute an organic whole.

I have no intention of entering into an exhaustive review of the history of the science; which is indeed so intimately blended

with, and forms so essential a part of, the general history of Medicine, that to give it full justice would occupy much more time than is at our disposal. But it may not be without profit to glance at some of the more salient features in its history, and trace the mode in which its various departments have grown, and the aspects which it has presented at different periods.

To take, indeed, an occasional retrospect of this kind is most useful; for amidst the more immediate interests which the discoveries of our own day necessarily attract, the deeds of those who have gone before us, the mode in which they advanced the science and placed it in a position which enables us to start on favourable terms for making new conquests, are apt to be forgotten.

Amongst the ancient Greeks and Romans, the conception of the anatomy and physiology of the human body was not only incomplete, but in many cases inaccurate. For a time, indeed, the study of human anatomy by dissection seems to have prevailed in the school at Alexandria, but its practice must have been subsequently discontinued. Galen even, whose treatise on anatomy was the standard work for a lengthened period, most probably derived his acquaintance with the subject from the dissection of animals, more especially dogs and monkeys.

With the revival of learning, however, in the fourteenth century, attention began to be more particularly directed to the anatomy of the human body, and during that and the two following centuries, a succession of distinguished cultivators of the science occupied professorial chairs in the Italian universities, more especially in that of Bologna.

If we consult the Treatises on Anatomy published during this period, we find, as might naturally be expected in the infancy of the science, that the great object evidently was to identify the various parts, to indicate the relative position of organs, to group them into systems, to determine their physiological relations to each other, to draw up descriptions, and to apply names; so that the parts described might be recognised by others, and a common language be established amongst anatomists. Though many of the names which were applied sound inelegant, or perhaps fanciful, in our ears, and from what we now know of the structure and function of parts, are not at all times very appropriate, yet they have become so incorporated with the literature of the science, they are

so invested with the halo of antiquity, and, in not unfrequent instances, are associated with the names of great and honoured anatomists, that to discard them now from our vocabulary would be most inexpedient.

During the last two centuries and a half the spread of learning over Europe, the large increase in the number of investigators, owing to the zeal with which the natural sciences have been pursued, and the special need of a knowledge of the structure and functions of the human body in connexion with the practice of the healing art, have given an additional stimulus to anatomical study, and have extended largely our acquaintance with the appearance, form, position, and relations of the constituent parts of our frame. But though so many skilled observers have directed their attention to this aspect of the subject, yet we are not in a position to say that we have reached the limit of inquiry, and that our information on such matters as we can see with our unassisted eyes, or touch with our hands, is incapable of further expansion.

For as our science is in a state of constant progress, and as questions are continually arising which were not dreamt of by our predecessors, the work of former years requires to be revised, and features in construction are discovered which had previously been overlooked.

In such well-known and apparently exhausted regions as the hand and foot, the discussions of the last few years respecting the comparative morphology of the limbs of men and monkeys have led to the observation of arrangements of muscles and tendons which had not hitherto been noticed. What an important advance has recently been made in unravelling the complex disposition of the muscular fibres of the heart, the bladder, and other hollow viscera! How recent is the period in which we could say that we had arrived at even an approximation to a precise knowledge of the lobes and convolutions of the cerebrum! and even yet we may question if the thread which should guide us through all their windings has been grasped. In which of our text-books are the surfaces of the moveable joints described with sufficient exactness to enable the mechanism of the articulations to be properly understood?

But, along with the study of the appearance, form, position, and relations of the constituent parts of the body—aspects of the science

which not unfrequently are associated together by the name of "descriptive" anatomy—its more intimate construction, the textures by the intermingling of which it is built up, were attended to. For the past seventy years the term "general" anatomy has been employed to express this branch of the subject; but of late years, actuated by a fondness for employing Greek terms in scientific nomenclature, some writers have designated it by the name of Histology.

But if you use this modern term histology, do not suppose that the department of anatomy to which it is applied has only recently been discovered, or that you are about to be introduced to a new science. The germ of the subdivision of anatomy into the branch which treats of the component textures of the bodies of man and animals, and that which describes the form, position, and connexions of their organs, members, and regions, may be found in the writings of Aristotle. In his celebrated treatise, "De Partibus Animalium," he distinguishes by the name of "partes similares" those structures, such as bone, cartilage, vessels, sinews, blood, lymph, fat, flesh, which, not confined to one locality, but distributed throughout the body generally, we now call the tissues or textures; whilst he applies to the head, the neck, the hands, the feet, the trunk, the extremities, and so on, the name "partes dissimilares."

Both these divisions of the subject were also familiar to Galen, and they were distinctly recognised by the early Italian anatomists. Berenger of Carpi, Professor in Bologna in the beginning of the sixteenth century, gave a systematic account of tendon, ligament, muscle, nerve, membrane, fat, etc. Since that period the consideration of these tissues has formed an important element in anatomical inquiry; and all the best systematic writers, both in this country and abroad, have included descriptions of them in their works. In the year 1732, De Bergen pointed out the general distribution of the tissue called by him "cellular," but which we now know as the fibrous, areolar, or connective tissue, throughout the various regions and organs of the body. The illustrious Haller, also, in his chapter on the Tela Cellulosa, fully recognised the importance of this tissue; and in the second volume of the "Medical Observations and Inquiries," Wm. Hunter directed attention to the difference between the cellular and adipose tissues. The first systematic memoir exclusively devoted to the examination of the

anatomy of the textures appeared in the year 1763, when Andrew Bonn of Amsterdam published a dissertation, entitled "De Continuationibus Membranarium," in which, after some remarks on membranes generally, he proceeded to describe the cuticle, the cutis, the sheaths of muscles, the periosteum, and the fibrous and serous membranes lining the great cavities of the body. The genius and descriptive power of the celebrated Bichat subsequently gave a great stimulus to this department of inquiry. In his work on "General Anatomy," in that of his countryman Béclard, in the memoir of Milne Edwards "On the Elementary Structure of the Principal Organic Tissues of the Human Body," in the writings of Meckel, and in the first volume of "A System of Human Anatomy," by the late Dr John Gordon, lecturer on Anatomy in this city, the anatomy of the tissues was described and elucidated as far as it could be recognised either by the naked eye, or by the powers of the microscope then in the hands of observers.

To pursue in an efficient manner the anatomy of the textures, it is not only necessary to use the knife, the scissors, and the forceps, but more refined methods of dissection must be resorted to. One of the most important aids that we can employ is to inject into the blood and lymph vessels, into the ducts of glands and other tubular passages, mercury and various coloured fluids, by which they may be distended and more easily recognised. The art of injecting came extensively into use during the last century, and, as far as the materials employed would admit of, attained in the hands of the Dutch anatomist Ruysch, of the Italian anatomists, and of the Hunters, Hewson, and the second Monro, a state of comparative perfection. By the employment in later years of injecting materials which possess greater powers of penetration, the art has so advanced that it is now possible to inject the finest ramifications of the bloodvessels and gland ducts, and trace them out so thoroughly that but little room for improvement in this method of demonstration seems possible.

Discoveries in chemistry have also provided the anatomist with important aids in the investigation of the textures. Some years ago it was observed that an ammoniacal solution of carmine applied to the tissues communicated a red colour to some of their anatomical elements, whilst others were not stained by it. By the chemico-

physical action of this dye, the nuclei of the textures, which, in the untinted condition, are sometimes difficult to detect, may be seen and examined with comparative ease.

The property possessed by spirits of wine, chromic acid, and various other re-agents, of hardening those textures and organs which, in their normal condition, are so delicate as to render their examination most perplexing, has contributed very materially to facilitate the acquisition of an exact knowledge of the fundamental features of their construction.

It is, however, the application of the powers of the microscope, simple and compound, to the investigation of the tissues, that has led, more than any other instrument or agent, to an advance in our knowledge of textural anatomy.

By the rapid strides which this method of inquiry has taken since the year 1830, when great improvements were effected in the construction of achromatic compound object-glasses, the discoveries of the earlier investigators in the same field have been overshadowed, and by some even almost ignored; and the idea seems to have been entertained, that our acquaintance with the anatomy of the textures dates from this very recent period, and that the histological department of anatomy owes its origin to the improvements in the construction of the compound microscope. We may easily satisfy ourselves of the erroneous character of this supposition, if we trace the progress of inquiry in this department.

So far back as the middle of the seventeenth century, Robert Hooke employed magnifying glasses in the minute investigation of the tissues of plants and animals, in the examination of the gravel in urine, and of the crystals in snow; and he published many beautiful drawings of these objects. About the same time, Nehemiah Grew employed the microscope in his investigations into the minute anatomy of plants. At this period, also, the Dutch philosopher, Leeuwenhoeck, a man of extraordinary acuteness, subjected to microscopic examination many of the solids and fluids of the body, and not only recognised the presence of scales in the cuticle, determined some points in the structure of nerves and of the brain, but even discovered the presence of corpuscles in the blood and milk, and the spermatozoa in the seminal fluid. Important information on the minute structure of the spleen and of the secreting glands, more especially the kidney, was afforded by Malpighi, to whom is also due the honour of being the first to recognise the

movement of the corpuscles of the blood in the vessels of the living animal.

And as we glide along the stream of time, and follow the course of discovery, from the seventeenth, through the eighteenth, into the beginning of the nineteenth century, the names of De Graaf, of Clopton Havers, of Brunner, of Lieberkühn, of the second Monro, of Hewson, and of our venerable Principal, Sir David Brewster, almost involuntarily arise to the recollection of all anatomists in connexion with important discoveries in the minute structure of the ovaries, of bone and synovial membrane, of the pancreas, the intestinal and other secreting glands, the blood, the lymph, the spleen, the lymphatics, and the crystalline lens.

The recent improvements in the construction of achromatic object-glasses to which I have already referred, the great diminution in their price, the simplicity and perfection of the mechanical arrangements of the microscope, and the readiness with which it can be employed, the charms of novelty, the power which it bestows of penetrating into the mysteries of structure, and the exactness of the results which can be obtained, have popularized the instrument, and placed it in the hands of a large number of observers.

What these results may be, so far as they bear on the structure of the human body, and can with certainty be stated, it will be my duty to bring before you, in their proper order, in the course of the session. But it may not be out of place if I take this opportunity of stating, that the accuracy of the conclusions which may be drawn from the employment of this instrument as an agent in anatomical research, very materially depends on the previous training in that branch of anatomy, and in that mode of thinking about structure, in which you can become proficient only by constant attendance in a dissecting-room.

It is there that you see and handle parts in their integrity; it is there that you study their connexions and relations, observe their forms and appearances, and are in a position most readily to recognise those fundamental features in construction, which, proper to an organ as a whole, are shared in by its smallest parts.

On the other hand, when a specimen is prepared for examination with the microscope, it is of necessity only a fragment of a texture or an organ; it has perhaps been sliced so thin as to be translucent, or torn to pieces with needles, or even acted on by a powerful

chemical re-agent, and its relations and connexions are to a great extent injured and destroyed.

To dissociate the study of those aspects of structure which the naked eye can recognise, from those more minute forms which it requires a microscope properly to examine, to place in the hands of different teachers, as is done in some of our medical schools—but as is not the case in this University—these closely-allied departments of the same science, destroys its unity, and induces in the minds both of teacher and student illogical conceptions of their true relation to and dependence on each other. By such artificial separation errors most readily arise in the interpretation of the appearance and meaning of the objects examined, and impediments are thrown in the way of the advancement of the science.

And here I would take exception to the term "microscopical science" which one occasionally finds employed,—a term which seems to me to involve a confusion of thought, and to lack that precision in expression which is so essential in all scientific nomenclature; for the microscope is not the science, it is merely the instrument employed in scientific investigation, and can be used not in one science only, but in several. It is an instrument which is alike valuable to the anatomist, the physiologist, the pathologist, the zoologist, the botanist, and the crystallographer. As astronomers, even so far back as the days of the ancient Chaldeans, were acquainted with the risings and settings of planets, and predicted eclipses of the moon, centuries before a telescope was directed towards the heavens, so were many important facts appertaining to the structure of animals and plants, and to the shapes of crystals, known to the cultivators of the biological and mineralogical sciences, long before the unassisted eye received any aid from magnifying glasses.

Side by side, nay, preceding even, the study of human anatomy, the structure of the bodies of animals has been most industriously inquired into. Through the labour which has been bestowed on this department of the science, not only in the earlier epochs of anatomical research, but more especially during the past and present centuries, by hosts of acute and able workers, an immense mass of facts bearing on the structure and conformation of both the vertebrate and invertebrate forms of organization, has been collected.

To one possessing an acquaintance with human anatomy, the acquisition of the leading facts and principles of comparative anatomy presents much less difficulty than if the subject were approached without any preliminary knowledge of the science. For the human body is so much more complex in its construction, and the purpose which it serves is of so far higher a nature, that, when it is mastered, the anatomy of the more simple forms can be studied with comparative ease.

Many of the most honoured names which adorn the roll of comparative anatomists, are those of men whose first introduction to the subject has been through the study of human anatomy, and whom we are proud to claim as members of our own profession.

The influence which the study of comparative anatomy has exercised on the progress of Zoology has been of a most beneficial character; and, in all the best modern systems of classification, not only have the external features of animals been compared with each other, but the differences or resemblances in their internal structure have served as a basis in the arrangement.

To the physiologist also the study of comparative anatomy has done good service. From the possibility of placing many animals under certain artificial conditions, and of submitting them to well-devised courses of experiments, which could not be carried out on the human body, most important conclusions have been arrived at respecting the functions of many organs. From the comparison, also, which has been instituted between the structure of different animals, from the constant correlation in some forms of certain given structures with certain given functions, and from the absence in other forms of these structures, with a corresponding inability to perform those functions, the dependence of one on the other has been most satisfactorily established.

But quite distinct from the aid which is derived from the comparative study of human and animal structure, in the determination of the functions of parts, there has sprung up, during the present century, a department of anatomy in which a structure is looked at, not with reference to the function which it may have to perform, but to the place which it holds, not only in the body of a single animal, but throughout the whole series, under whatever modifications in appearance, form, or function it may present.

This is called Morphological or Homological Anatomy. Over many minds the study of homologies, notwithstanding, nay, perhaps

because of its difficulties, exercises a fascination far greater than that which is induced by the investigation of parts from their teleological aspects. Owing to the modifications in appearance, in size, in form, in number, and sometimes even in position, which parts not unfrequently undergo in conformity with their adaptation to the performance of functions of different kinds in different animals, their original characters may become so masked as to render their recognition extremely puzzling.

Hence it becomes a matter of necessity, not merely to trace the various gradations in form which the part undergoes in the animal series, but to watch its mode of development and growth from its first appearance in the embryo to its stage of completion. In this manner has arisen the department of Developmental Anatomy, which notes not only how, from very small beginnings, by the assumption of a succession of forms, an organ as a whole becomes developed, but the modifications which take place in the form and appearance of the tissues of which the organ is composed, as they pass from their rudimentary to their perfect condition.

The study of developmental anatomy in connection with the morphology of tissues and organs has been pursued with great avidity during the past thirty years, and still occupies the attention of many of our keenest observers and thinkers.

Although many problems in development still remain unsolved, yet it has very materially influenced the course of thought, and guided the direction in which organological and histological studies should be pursued. By its application to the former it has served to check, and modify, and test the accuracy of morphological conclusions, which had been arrived at by a reference, in the first place, to comparative anatomy alone; it has aided in recognising the true relations of parts, and the similarity or identity of organs widely different, perhaps, in form and appearance.

Through its application to the anatomy of the textures, their mode of origin has been determined—their descent from pre-existing structure has been observed—and the persistence of anatomical elements which, because they became concealed by secondary formations, were at one time supposed to have disappeared from the fully-formed texture, has been satisfactorily ascertained.

What a wide expanse of knowledge is opened up by the study of anatomy in its various departments! The elucidation of struc-

ture, whether on a large or a small scale;—be it the unravelling of the highly complex mechanism of the human body and those of the higher animals, or the determination of the structure of the simplest cell, or fragment of protoplasm.

It forms the basis of the biological sciences. Just as a knowledge of the laws of motion is essential, and must be constantly recurred to at every step, before any true progress can be made in the investigation of the physical sciences, so must the structure of the human and animal frame be constantly appealed to in all attempts at classification—in all inquiries into the adaptation of parts to special means and ends—in all discussions respecting the multiform functions they enjoy in a state of health—and the alterations or disturbances in those functions, which take place in the course of disease.

How admirably fitted, then, is this science to hold a place in the system of university education! How well adapted is it to call forth some of the best and most noble qualities of the mind! The habit of observation must be cultivated in order to see truly and completely the objects to be examined. The judgment must be employed rightly to interpret the appearance which these objects present; the habit of comparison must be acquired when one structure is contrasted with another; the reflection which it is necessary to exercise in order to draw correct inferences of the uses of organs, and the part which they play in the economy of the entire organism; nay, the spirit of speculation which may be indulged in respecting the origin of the forms which we see living and moving around us, and the place which they fill in the great scheme of nature;—all conduce to the discipline of the mind, and to the promotion of general intellectual vigour.

But to the bulk of those I am now addressing the study of anatomy commends itself not only on account of its general scientific value, or its efficiency as an agent in education, but from its special applications to the pursuits of your future lives. To you it appeals most significantly. As students of Medicine, you are especially called on to direct attention to the anatomy of the human body, to inquire into the structure of its complex frame-work, to recognise the correlation of organ and function, the co-ordination of parts with each other, and the extent and nature of their mutual interdependence. But further, you must be able to distinguish when these organs get out of repair; when the functions which they per-

form in their healthy state have become altered or obstructed, or perhaps altogether suppressed. You have to become familiar with the structure of the human body, not only in its time of health and strength and power, but when old age has rendered it decrepid, when degeneration has impaired its vitality, when disease and injury have rendered imperfect, or destroyed, one or more important organs.

To prepare yourselves for this duty, during that portion of your lives when you are especially called students, will be no easy matter. It will tax your energies and test your powers of work. Nay, to master the details and principles of healthy structure alone will absorb much of your time and require great perseverence. And, if these be not mastered early, the foundation, on which you may seek to raise the solid fabric of professional knowledge and success, will be unstable as the shifting sands, and prone to change with every wave of doctrine.

I call on you, then, not to pass hastily over your anatomical studies. Do not waste your present opportunity—more especially do not neglect your work in the dissecting-room—work which can only be properly performed by the labour of your own hands. If a knowledge of anatomy is not acquired now, when at college, you will, in all likelihood, ever remain ignorant of it; for, from the nature of the subject—from the restrictions which lie in the way of obtaining the necessary material—the study of the anatomy of the human body by dissection can only be properly pursued in a recognised medical school or college.

But further, do not commit the great error of thinking that, when you have passed your examination, all further attention to the subject will be quite superfluous; and that you may stow, in some far distant corner of your memory, nay, perhaps, quietly allow to slip away, all that information which you have spent so much labour in acquiring.

To pass an examination with credit is only a step—an important one, no doubt—in your professional career; but it is not the main end or object of your education, and should be looked upon merely as the basis from which you start to fight the great battle of life, bearing on your front the stamp of academic training and distinction. Largely though it may loom before those of you for whom it is immediate, yet the knowledge and skill you have acquired, or are about to become possessed of, are not to be employed for it

exclusively, but are to constitute the material with which you will have to work during your future lives.

And now, gentlemen, we will briefly consider the extent and nature of the anatomical instruction afforded by those who have preceded me in the post, the duties of which I am now called on to discharge. For the Chair of Anatomy in this University has a history. It is no creation of yesterday. Founded in the year 1705, it ranks amongst the oldest chairs of anatomy in this country, and it presents this very remarkable feature, that from the appointment of Alexander Monro *primus*, in the year 1720, to the death of my immediate predecessor in the spring of the present year,—*i. e.*, for the space of one hundred and forty-seven years—it has been held by only four incumbents, each of whom, prior to his elevation to the chair, had, like myself, filled for a period the office of assistant to his predecessor. Hence there has been directly transmitted to each successive occupant an unbroken tradition of teaching, which has given to the method of instruction adopted a unity and consistency such as has undoubtedly contributed in no small degree to the efficiency of the chair, and added largely to its reputation.

At the time when the first Monro obtained the appointment, anatomists were more especially striving to fix, by a precise system of nomenclature and description, the names, position, and general relations and connections of the organs of the human body, a proceeding to which he—a master of the art of describing—very materially contributed. His classical treatise on Osteology still serves as a model how such descriptions ought to be written. But he did not confine himself to this single aspect of descriptive anatomy. He explained the anatomy of the textures, and employed comparative anatomy in elucidating and illustrating human structure. In the arrangement of his course of anatomical lectures he pursued the following plan:—Before he described the individual bones, he gave an account of their structure and uses. He not only demonstrated the position of the muscles, nerves, bloodvessels, abdominal and thoracic viscera and brain, but always treated particularly of their structure. Moreover, he illustrated the anatomy of man by the dissection of quadrupeds, fowls, and fishes; and compared the structure and uses of their organs with those of the human body.

His successor, Alexander Monro *secundus*, profiting by the training which he had received, not only from his father, but from distinguished anatomists in London and abroad, raised the reputation of this chair to be amongst the first in Europe. Not only did he demonstrate from recent dissections the parts of the human body, but we have positive evidence, in his own writings, that he employed the microscope in the investigation of the minute structure of the brain, the organs of sense, the nerves, the muscles, the bones, the integument, the hairs, the spleen and lymphatic glands, the lungs and the secreting glands; and he used this instrument in his lectures to demonstrate the minute structure of the tissues to his class. Like his cotemporary, the illustrious Haller, he was keenly alive to the necessity of combining the study of anatomy with physiology. In the Anatomical Museum of the University, of which he was the founder, many most illustrative specimens are preserved, which prove that he had thoroughly mastered the most important features of construction of many of the glandular organs. His lectures on Comparative Anatomy constituted also an important part of his course. His great work on Fishes, and his writings on the Comparative Distribution of the Lymphatics, remain lasting memorials of his industry and knowledge.

Alexander Monro *tertius*, though without the genius for general anatomical research which characterized his father and grandfather, was a man of varied accomplishments. In the earlier years of his professional career, the study of Morbid Anatomy, under the guidance of the Hunters and Matthew Baillie, and of Surgical Anatomy under the influence of the French school and of the Bells, had assumed a place in medical education such as they had not previously attained. To these departments the third Monro more especially directed his attention, enriching their literature with several important contributions. From the statements made in the various editions of his Elements of Anatomy, it appears that he not only lectured on descriptive anatomy in its more limited signification, but that he entered minutely into the structure of organs, and brought the microscope into play in the investigation of the tissues. It may be interesting, also, to note, now that so much attention is given to inquiries into the forms of skulls in the different races of men, that early in the present century he formed the nucleus of the craniological collection in the Anatomical Museum, and, following the example of

Blumenbach and Camper, published figures of skulls of various races.

But the third Monro was not a popular teacher; so that, during his incumbency, a large number of the students frequenting the Edinburgh School of Medicine obtained their anatomical education under Barclay, Knox, Gordon, and other extramural lecturers, some of whom still fill places of honour and trust amongst us.

Under the firmer grasp, however, of his successor, John Goodsir, the benches of the anatomical theatre were once more filled with an eager and attentive auditory; the dissecting-room was crowded with busy workers; and the general attendance on the class for many years averaged between 300 and 400 students.

Addressing you, as I now do, so soon after his departure from amongst us, to give an estimate of his life and work, and of the place which he will ultimately fill in the history of our science, may seem premature. But to the value of his method of instruction, to the truly scientific spirit which pervaded his whole teaching, to the influence which his straightforward, manly character exercised on those who came into personal relations with him, to the example which he set of true work done in no self-seeking spirit, I may be permitted to bear testimony. An ardent student of organic science, and of unflagging industry, he devoted himself to the duties of his chair with untiring energy. Gifted with a genius for anatomical research, he very early in life commenced the investigation of animal structure, and by the assiduous cultivation of his time and talents, he was able to grasp the subject in all its bearings, to discover new facts, and to enunciate new principles. Like his predecessors, he was not a mere descriptive anatomist, but, availing himself of all the most recent improvements in methods of study and demonstration, investigated the science in its relation to physiology, pathology, histology, morphology, and development.

In his lectures on Human and Comparative Anatomy, not only did he bring before his pupils the current knowledge of the day, such as may be found in the best and most recent text-books, but he announced to them the results of his own investigations, and pointed out, and suggested, the direction in which inquiry might be most profitably directed with a view to further discoveries. It was to this, more, perhaps, than any special faculty for exposition, that his success as a teacher was due. The numerous published essays

on the various departments of anatomy by his former pupils testify to the influence which he exercised over their thoughts and studies, and furnish, perhaps, the best test of his power and usefulness as a teacher; for he was not only enthusiastic himself—he could elicit enthusiasm from others.

The system of anatomical instruction adopted in this University does not consist only in the delivery, by the professor, of a systematic course of lectures, and in the practical work of the dissecting-room; but, in addition, there has existed for one hundred years a supplementary course, termed "anatomical demonstrations," conducted either by the professor himself or by his assistant and demonstrator. Instituted in the year 1767 during the incumbency of the second Monro, and conducted successively by John Innes, Andrew Fyfe, William Mackenzie, John Goodsir, and myself, it has been the means of bringing before the student the anatomy of the human body, not as a collection of systems and organs, but with reference to the relative position of parts. By the extra-mural teachers of anatomy in this city, a class of a similar character has been conducted for upwards of thirty years. It has been adopted in other of the Scottish universities, and it exists in at least one of the London medical schools. From the mode in which these demonstrations are arranged, from the custom of subdividing the body into those regions, and of examining it in that order, which you are called on to pursue in the course of your own practical labours, they have acted as a great stimulus to dissecting-room work, and have tended to promote the study of anatomy in its relations to practical Medicine and Surgery. From my own experience, extending now over a period of thirteen years, I can testify to the great benefits which are conferred by a course of this nature, and to the popularity which it enjoys amongst the students of the University.

For there are two methods in which the study of the structure of the human body may be pursued—the synthetical and the analytical. In the former, you commence with the bones or hard framework of the body. You attend to their position, shape, and structure. You then proceed to look at the mode in which they are connected together at their articulations and study the movements of the joints. You clothe the bones with the muscles, observe their attachments and structure, inquire into their action, and trace out the arrangement and distribution of the blood and lymph vessels

and nerves. Finally, you examine the structure and arrangement of the viscera and integument. And thus you build up a conception of the structure of the body as a whole. This is the method pursued in the systematic lectures.

If you follow the analytical method of inquiry, you begin at the surface of the body, and remove layer by layer the integument and fasciæ, and examine the muscles as they are gradually brought into view. You then study the positions and relations of the vessels and nerves, and of the viscera lying in the cavities of the body. Finally, you reach the bones and joints. It is in this manner that your studies are conducted in the dissecting-room; and it is in the same order and with the same object that the anatomical demonstrations are arranged.

The constitution of the anatomical chair wisely provides that the teaching of the professor should not be confined to any single department of the subject. His commission empowers him to teach the whole science, and, according to the measure of his knowledge and power, this has been the practice of each of my predecessors.

Year by year, the science, in its various relations, has been passed under review, and whilst the details have not been neglected, the general principles of construction have been expounded, and their application to the other departments of medical study has been pointed out.

Hence the anatomical instruction imparted in this University has been characterized by its completeness, and by its adaptation to the requirements of each succeeding epoch.

The past history of this chair, therefore, is one on which we may look back with pride. Worthily to tread in the path pursued by those who have gone before, may well serve as an object of ambition to the anatomist. To conduct the study of the science in that comprehensive spirit which has characterized the teaching of former professors, and to strive to reach their standard of excellence, must ever be a matter of duty. To teach not only those facts in our science respecting which there can be no question, and on which dogmatic speaking is permissible; to show in what direction progress is possible and can be made; nay, more, to induce some perhaps to act as pioneers in opening up paths as yet untrod, is incumbent on him who fills the Chair of Anatomy in this great University.

If that golden rule, which ought never to be lost sight of by one holding the responsible office of a Teacher, be ever kept in mind, that the value of a course of instruction depends not only on the importance of the subject, but on the truthful spirit with which it is taught, then one may hope that, when in future years you recall the hours spent on the benches of the anatomical theatre or by the tables in the dissecting-room, each of you will be able to say, "There I acquired knowledge, there I treasured up facts, which have stood me in good stead at many a difficult and anxious stage of my professional career."

PRINTED BY OLIVER AND BOYD, EDINBURGH.