Introductory lecture to the course on anatomy and physiology, in the Vermont Academy of Medicine : delivered April 7, 1841 / by James M'Clintock.

M'Clintock (Jas.)

ANNUAL LECTURE.

INTRODUCTORY LECTURE

TO THE

COURSE ON ANATOMY AND PHYSIOLOGY,

IN THE

VERMONT ACADEMY OF MEDICINE.

DELIVERED APRIL 7, 1841.

BY JAMES M'CLINTOCK, M. D.,
PROFESSOR OF ANATOMY AND PHYSIOLOGY,
LECTURER ON ANATOMY AND SURGERY IN THE
PHILADELPHIA SCHOOL OF ANATOMY. ONE OF THE
PHYSICIANS TO THE PHILADLPHIA HOSPITAL, &C.

PUBLISHED BY THE CLASS.

CASTLETON:

PRINTED BY L. R. H. ROBINSON.

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1841.

PROFESSOR McCLINTOCK:

DEAR SIR,—The undersigned, Committee in behalf of the Medical Class of the Vermont Academy of Medicine, do respectfully solicit, for publication, a copy of your valuable Introductory Lecture, delivered at this Institution April 7th, 1841.

Very respectfully, Yours,

E. H. SPRAGUE,
A. HAGAR, M. D.
P. F. NEWELL,
R. C. M. WOODWARD,
} Committtee.

Castleton, May 11th, 1841.

MR. E. H. SPRAGUE, A. HAGAR, M. D. MESSRS. P. F. NEWELL, AND R. C. M. WOODWARD:

GENTLEMEN:—Your communication of yesterday, requesting a copy of my Introductory Lecture for publication, was duly received.

When the Address was written, I had no thought that it would be printed, but, in compliance with your request, the accompanying copy is cheerfully placed at your disposal.

Accept for yourselves, Gentlemen, and the Class you represent, the best wishes of

Yours sincerely,

JAMES McCLINTOCK.

Castleton, May 12, 1841.

LECTURE.

Gentlemen,—Having been honored with the appointment of Professor of Anatomy and Physiology in this Institution, I appear before you on this occasion in the discharge of my duty and in accordance with the usual custom, to deliver a Lecture as Introductory to my course of Instruction.

Believing, as I do, that all such addresses should have some connection with the consecutive course of Lectures, I shall at this time engage your attention with a brief history of Anatomy and Physiology and their cultivators; after which I will endeavor by a few remarks to show you the importance of the study of Anatomy to the Physician.

The knowledge afforded by the study of the history of any science, is not merely ornamental or superfluous, but instructive and useful, and conducive to the just comprehension of the subject to which it relates.

By an examination of the successive steps by which science has advanced from a rude origin to its present state, and the course which marks its varied progress, and even occasional retrogressions at different periods, according to the prevailing disposition of the age, either to a servile submission to authority, or to the hasty adoption of visionary hypotheses, we are enabled to derive most important rules for our government in the search after truth.

Although the acquirement of Anatomical knowledge by dissection was unknown in the early periods of society, opportunities must have frequently occurred, in the rudest ages, of observing the structure of parts of the body of men and other animals.—Even the savage could not fail to observe, partially at least, the organization of the animal which he slew in the chase, prepared for food, or offered for sacrifice; and, although deterred by superstition or natural repugnance, from a close examination of the human body, facilities for such study were, no doubt, frequently presented, for human bones, and sometimes entire skeletons were found by those who visited the field of battle; indeed, the most ancient and imperfect languages indicate an acquaintance with the principal bones, and most important and conspicuous viscera of the body.

The custom amongst most of the ancient nations, of consigning dead bodies to destruction by fire, was one of the chief obstacles to the advancement of anatomical knowledge.

It has been supposed that the manner of embalming practised by the Egyptians, the most ancient nation of whom we possess any authentic record, would familiarize them to anatomical enquiries; but in reality, that custom neither required, nor was calculated to impart any skill in such pursuits. It was merely a religious ceremony, performed in the rudest manner; consisting of

a removal of a portion of the viscera, and filling the cavities with aromatic substances. Could it even have imparted any knowledge of the organization of the body, the abhorrence in which those who performed the operation were held by their countrymen would effectually have prevented them from communicating the knowledge which they had thus acquired; for, immediately after making the incision, the operator ran away followed by the imprecations and even violence of the bye-standers, who considered him to have violated the body of a friend.

The progress of Anatomy, in the early ages of the world, was was more particularly prevented, by a very generally prevalent opinion, that the touch of a dead body communicated a moral pollution. When the extent and inveteracy of this prejudice is considered, the cause of the imperfect state of anatomical knowledge is sufficiently explained. The ceremonial law of the Jews was very rigorous in this respect. To touch several animals which they accounted unclean, subjected the person to the necessity of purifications. To touch a dead human body made a man unclean for seven days.

Anatomy as a Science was first cultivated by the Greeks, a people who were the most free and enlightened of all the nations of antiquity. Homer displays an extent and accuracy of Anatomical knowledge, that when the period in which he lived is truly extraordinary. Some writers have supposed that he has often described his heroes as wounded, that he might thus have opportunities of displaying by the minuteness of his details, his superior information in anatomy.

Hippocrates, who lived about 400 years before the christian era, is generally believed to be the first who wrote specially upon this science.

At that period, a knowledge of Medicine had been in a great measure hereditary in certain families. This was the case in the family of Hippocrates, who is said to have been the 14th descendant from Esculapius on his father's side; while his maternal ancestry could be traced to Hercules. He had been instructed in all the learning of those times, but particularly devoted himself to the cultivation of Medicine, which he formed into a distinct science, collecting and arranging all the information on the subject that was then known.

The anatomical details which are interspersed throughout his works are numerous; but they do not exhibit any profound knowledge of the subject, for they are, in many instances, incorrect.—

far was he from having any idea of the real nature of the circulation of the blood, which some writers have done him the honor to suppose he had discovered, that he imagined that the arteries contained air; and he did not know whether the veins had their origin in the liver, the heart, or the brain. He includes under the same name the ligaments, the tendons and the nerves.—

These imperfections, however, are to be imputed rather to the unavoidable disadvantages of the times, than to his own deficiency either of industry or talent; for when he had opportunities of displaying these qualities he far surpassed all his contemporaries.

About a century after Hippocrates, Ptolemy, king of Egypt, in opposition to the prejudice of his subjects, permitted the dissection of human bodies.

The facilities thus afforded were improved by Herophilus, who is considered the founder of the Medical School at Alexandria, and the first Anatomist who taught osteology from the human skeleton. He examined, particularly, the brain and its coverings; and a part of one of the sinuses of the dura mater is still called after him—the torcular Herophilii.

At the same period lived Erasistratus, a Syrian, who had the privilege of dissecting criminals that had been executed; his works are now lost, but from the quotations of later authors, he appears to have greatly advanced the knowledge of the human body; more especially by pointing out the particulars in which it differs from that of animals, whose anatomy had been previously studied as approaching nearest to the organization of man.

From the period just stated there appears to have been no anatomist deserving particular notice, until the time of Galen, one of the most celebrated Physicians of Greece. He was born about the 130th year of the christian era. No expense was spared in his education, after the completion of which, he visited all the most celebrated schools of philosophy which then existed, and afterwards resided chiefly at Rome in the service of the Emperors of that time.

Anatomy was his favorite pursuit, but, being debarred the advantage of examin ng human bodies,—the dissection of which had then been prohibited, even at Alexandria,—he had recourse to such animals as were supposed to have the greatest resemblance, in their structure to man. He has written very fully on every part of anatomy; and, indeed, his works may be considered a synopsis of all that was known on the subject in his time.

The great reputation which Galen had acquired, instead of promoting, tended rather to impede the advancement of anatomical knowledge during several succeeding centuries, as no hope was entertained of emulating the fame of one who was regarded as an oracle, all incentive to exertion was destroyed. But other causes, of a political nature, also contributed to the decline of anatomy, as well as of other branches of learning, from the time of Galen to the downfall of the Roman Empire, and during the ages of intellectual darkness which followed. Learning, however, was still cultivated at Alexandria, until that city was taken by the Saracens, in the year 640, at which time the celebrated library was burnt, with the exception of some medical works,

which the desire of acquiring knowledge to prolong life induced the conquerors to preserve.

The Arabians were satisfied with the information to be obtained from the writings of Galen; and as their religious rites prohibited all contact with a dead body, improvement in anatomy was of course entirely checked, until the 14th century, when some Italians, who were not satisfied with the anatomical instruction of the times, ventured to investigate for themselves.

Mondini de Luzzi, professor at Bologna, first publicly dissected two subjects in 1315, and soon afterwards published a description of the human body, which, for a long time, was the common system of Anatomy; but his researches were soon suspended by a decree of Pope Boniface VIII. prohibiting the boiling and preparing of human bones.

In the 15th century, Montagna, Professor of Padua, could boast of having dissected fourteen subjects, which were then considered a great number.

In the 16th century, anatomy improved more rapidly than heretofore; for, during this period, Berengarius, Stephans, Fernelius, and Andernack, dissected assiduously; but a veneration for the opinions of Galen, whose dogmas were still considered the best authority, was a great obstacle in the way of improvement, till Vesalius about the year 1520, boldly ventured to question the accuracy of his descriptions.

So great was the zeal of Vesalius, for dissection, that it is said he used to rob the gibbets and dissect the bodies in his bed-chamber. By this means he soon discovered that Galen's knowledge of anatomy, was obtained by the dissection of quadrupeds; and he then began openly to contradict the assertions of the Grecian Sage. At the age of twenty-five, he commenced his system of Anatomy, and after overcoming many difficulties, he completed it in the space of three years.

Teachers of anatomy who had always lauded Galen as the source of all information, were indignant that his faults should have been exposed by so young a man as Versalius. The controversies which ensued, accelerated the progress of anatomical knowledge, as the disputants were obliged to confirm their own opinions, or invalidate those of their opponents, with arguments furnished by the dissection of the human body.

Contemporaneous with Vesalius, was Fallopius, who was Professer of Anatomy at Padua. In 1561 he published his observations in Anatomy, which is considered by some writers one of the best works of the 16th century. About the same period, also, lived Eustachius, Professor at Rome; he was the first to describe the *renal capsules*, and the passage from the throat to the internal ear, called after him,—the Eustachian tube.

Fabricius Hieronymus, who succeeded Fallopius in the Professorship of Anatomy at Padua, is thought to have been the first

Anatomist who noticed the valves in the veins, which he demonstrated in 1574. It is probable that this circumstance led to the discovery of the real course of the circulation of the blood by the illustrious William Harvey, who was born in England in 1578.

To appreciate the importance of the discovery of Harvey, it will be advantageous to us, to review the history of the circulation of the blood, previously to his time.

From an examination of the works of Galen and his immediate successors, it has been satisfactorily demonstrated that the ancients knew nothing of the true course of the circulation.

They believed that the blood was formed in the liver, and conveyed through the veins by an alternate undulatory motion of these vessels in opposite directions; they also imagined that the finer parts of the blood, by transuding through the septum of the heart, from the right to the left side, mixed with the air received into the lungs, and formed a vital spirit which was moved by a kind of flux and reflux along the arteries.

"On the revival of Anatomy in Europe," says Dr. Roget, "some vague notions of the pulmonary circulation appear to have suggested themselves to many eminent men. Vesalius demonstrated that the blood could not possibly pass from the right to the left ventricle, through the septem of the heart. Realdus Columbus, Professor of Anatomy at Padua, who had been a pupil of Vesalius, distinctly traced the passage of the blood through the lungs. The same fact had, moreover, been discovered by Michael Servetus, who was born in Aragon, in 1509. Farther progress was made by Andrew Cœsalpinus, an Italian Physician, who speaks of a communication existing between the veins and arteries at their remote extremities, and notices the effect of the valves of the arteries and of the auricles as calculated to prevent a reflux of the blood; but he is quite at a loss to reconcile this observation with the common notions which he had imbibed, and to which he still adhered, of the functions of these vessels. But, notwithstanding these apparent approximations to the truth, it is probable that many ages would have elapsed before the complete discovery of the circulation, if some bold and penetrating genius, such as that of Harvey, had not arisen.

After having studied six years at Cambridge, he, at the age of twenty-one, went to the University of Padua, which was then one of the most celebrated medical schools in the world. He became the pupil of Fabricius, who was, at that time, in the habit of demonstrating the valvular structure of the veins. Harvey's attention having been thus directed to the subject, he, on his return to England, began his investigations on the use of the valves. In the course of his inquiries on this point, he performed many experiments on living animals, and, by this means, he ascertained the real course of the blood in its circulation;—thus consummating one of the greatest discoveries ever made in any science.

Harvey taught this new doctrine, in his lectures, about the year 1616, but did not publish any account of it till 1628. On its promulgation it met with the most violent opposition; and so inveterate were the prejudices of the public, that the practice of Harvey was considerably diminished in consequence of his discovery. It was remarked that no physician who had passed the age of forty, would admit the truth of a doctrine so much at variance with all the systems in which he had been educated. Envious of his growing reputation, many of his contemporaries had recourse to all kinds of sophistry, with the view of detracting from his merit. They at first vehemently contested the truth of the doctrine; but afterwards, when forced by the decisive evidence adduced in its support, to admit its validity, they changed their mode of attack, and alledged that the merit of the discovery did not belong to Harvey; the circulation having been known even to the ancients. But vain were all the efforts of envy and detraction to lessen that fame, which will command the admiration of all future ages.

Harvey's discovery was soon followed by another, in many respects, even more extraordinary;—the discovery of a great and important system of vessels, which had seldom been even partially seen, and the existence of which was unknown to anatomists of that era.

The food had been traced from the mouth to the stomach, and through the different convolutions of the intestines; but no one had ever observed a single passage by which the nutritious part of the aliment might be conveyed into the system. There had been seen, indeed, a number of veins on the intestinal tube; but, as none were observed except the concomitant branches of arteries, it was naturally supposed that the veins were the vessels which conveyed the chyle; and, as those which arise from the stomach and intestines terminate in the liver, it was believed that in that viscus the chyle was changed into blood, from which circumstance it was called the organ of sanguification.

This was the generally received opinion until 1622, when Aselius, in opening a living dog, observed vessels filled with a whitish fluid, passing from the intestines to the pancreas and liver, he at first supposed they were nerves, but more accurate examination proved them to be vessels; from the color of their contents, he called them lacteals.

About thirty years after the discovery of the lacteals, Pecquet, a French Anatomist, while experimenting upon living dogs, found that the lacteals emptied into the receptalum chyli; he also discovered the thoracic duct and traced it to its termination in the left subclavian vein.

The foregoing discoveries were made upon inferior animals; Veslingius ascertained that the same vessels existed in man: in 1634 he demonstrated the lacteals, and the thoracic duct in 1649.

About the same period Rudbeck, a Swede, discovered the general absorbents of the body; the lymphatics, and traced them to the throcic duct. Bartholin of Copenhagen, also claimed the discovery of these vessels, but most writers award the credit of having first seen them to Rudbeck.

To the use of the microscope, which was introduced about the middle of the 17th century, we are much indebted for a knowledge of the minute structure of different parts of the body. Malpighi an Italian, was the first to apply this instrument to anatomical purposes; he examined with it the minute structure of various organs, but his attention was chiefly devored to the investigation of the glandular system. Microscopic discoveries were also made by Swammerdam, Lewenhock, Bonnet, and others.

The manner of injecting the vessels, and preserving parts of the body by drying and varnishing, which had long been known and practised, was greatly improved by De Graaf, a Dutch anatomist, who, about the year 1660, invented the syringe now used for injecting.

Various fluids had been tried for injecting, none of which answered the purpose, until Swammerdam in 1670 introdueed the use of melted wax.

The art of injecting and making preparations, was much perfected by Ruysch, the friend and successor of Swammerdam.

Interesting and instructive as the inquiry might prove, to detail the labors and discoveries of the anatomists of the 18th century it would occupy more time than we can at present devote to it.—I shall therefore, merely refer to them.

In this era lived many men who by their assiduity in the prosecution of anatomical inquiries, made such discoveries as tended materially to advance the knowledge of the practice of medicine and surgery. Among them may be mentioned, Valsalva, Haller, Bœrhave, Vicq d'Azer, Cheselden, Scarpa, Munro, William Hunter, and many others; but the most distinguished anatomist and physiologist of this period was John Hunter the brother of Dr. William Hunter. He was the founder of the most extensive anatomical collection in Europe, the Museum of the Royal College of Surgeons in London.

By his accurate knowledge of anatomy, he was enabled to make so many improvements in the manner of performing various surgical operations, as to earn the title by which he is still known—the Father of British Surgery.

In the present century there have been many men, who by their researches in Anatomy have made for themselves an enviable reputation. The most most prominent of these is the celebrated Bichat, who by the force of his splendid talents and industry did morc in his short life, 31 years, for the advancement of anatomical science, than any of his predecessors in double that period. To him we are indebted for the most of our knowl-

edge of the elementary tissues, which constitute the different organs of the body.

In our own country, gentlemen, we have had, and still have, many men who by the extent and profundity of their knowledge of Anatomy, have acquired such celebrity, as to reflect honor on the land which acknowledges them as citizens.

The first teacher of Anatomy in this country, was Dr. Wm. Shippen of Philadelphia, who began to lecture in the year 1762. to a class of from twelve to fifteen students : in 1765 he was elected Professor of Anatomy, Surgery and Midwifery in the then, recently established medical department of the College of Philadelphia; his lectures were continued from year to year, except when interrupted by the revolutionary war, until 1792, when the College of Philadelphia and University of Pennsylvania were united ; and he was appointed Professor of Anatomy in the new institution.

In the year 1808, Dr. Casper Wistar was elected to the Chair of Anatomy, it having been vacated by the death of Dr. Shippen. As a lecturer, Dr. Wistar is said to have had few equals; as an anatomist, he has left an imperishable monument, for he was the founder of the most splendid and extensive anatomical cabinet in this country; which is called in honor of him,—the Wistar Museum of the University of Pennsylvania.

Among the brightest ornaments of our profession in this country, must be mentioned one, who by the exercise of his great talents and indefatigable industry in the study of Anatomy, raised himself in the short period of 35 years, from obscure poverty to the highest pinnacle of fame : such was Dr. John D. Godman.

The last to whom I shall call your attention, in this bright galaxy, is one, who has departed from us within the remembrance of us all. At an early age he went to Europe to complete his medical education, and as a private pupil of John Hunter, he devoted himself so assiduously to anatomical pursuits, that he became perfect master of the subject. When he returned to his native city, Philadelphia, and began the duties of his profession, he soon, as a physician, made a reputation which extended over the whole country : while in surgery, owing to his numerous improvements and successful operations, he, Dr. Physic, is called the Father of American Surgery.

Having now, gentlemen, given a brief history of Anatomy and Physiology, I will conclude this address with a few remarks in reference to the importance of the study of Anatomy. The student who devotes himself assiduously to the investigation of this subject, may congratulate himself that he is not pursuing a mere phantasy, but that he is acquiring real and substantial knowledge; for of all the departments of our profession, this is the one most legitimately deserving the name of a science, and it is the foundation upon which the whole superstructure of medical knowledge must be based.

The interesting and beautiful doctrines of Physiology, if not founded upon correct anatomical information would be mere vague hypotheses and ingenious speculations, but the two subjects are so intimately blended as to be inseperable, for the anatomist while examining the minute structure of the body, almost invariably acquires some knowledge of the functions, for although it be true that an acquaintance with the parts of the organization, does not demonstrate the uses of such parts, it is equally certain, that the one cannot be understood without an intimacy with the other.

The next department of our profession most intimately connected with this science, is Surgesy. Many men are first rate anatomists who, owing to constitutional peculiarites, can never become good surgeons; but in the whole history of medicine from the most remote antiquity down to the present time, there cannot be found an instance of one man who became celebrated as a surgeon without being well versed in Anatomy ; the individual who attempts the practice of the one without possessing the necessary acquaintance with the other, is like the mariner who tries to navigate the ocean ignorant of the locality of his port of destination, or the use of chart and compass by which he is to steer for that haven, he either drives his vessel ashore or rushes on the rocks upon which his ship is destroyed, and meets an ignoble but deserved fate—a watery grave, or else he runs into the quicksands and there meets an eqally certain doom. So with the pretended surgeon, he knows not the situation of the part to be operated upon, and is entirely ignorant of the tissues in his passage to it. For a thrilling picture of the horrors of a person in such a situation, I refer you to the description of the justly celebrated John Bell, in the first volume of his principles of Surgery.

Pathology is equally dependent upon Anatomy and Physiology for its existence; you can readily appreciate the impossibility of understanding the diseased actions of the body, without being fully aware of its structure and functions in a healthy state.

The practitioner of medicine, ignorant of Anatomy and Physiology, is but an experimenting quack, for how can he know the symptoms evolved by diseased parts, while he is not at all aware of the location and functions of such organs in a normal state?

The study of Materia Medica and Chemistry, instructive and necessary as I know them to be, would be but an idle waste of time without a previous or concomitant knowledge of our science, for vague and uncertain would be the prescribing of any one, no difference how well he understood the history, medicinal effects and incompatibilities of remedies, without being well grounded in Anatomy.

In Midwifery, that most delicate branch of our profession, the advantages of anatomical knowledge are strikingly manifest;

the practitioner who is not properly acquainted with the structure and functions of the parts, becomes, when the slightest mal-presentation occurs, agitated and alarmed, and in consequence of his most culpable ignorance, the mother for want of aid in this, the most momentous period of her life, is permitted to die undelivered, or, if the case do not terminate by her martyrdom, in all probability the innocent babe is sacrificed by his stupidity.

Far different under such circumstances is the conduct of one familiar with our science; he having carefully studied the axes, diameters and straits of the mother's organs, and being familiar with the correspondent part of the child, is enabled in almost all cases, to yield at once such assistance as to consumate the labor in perfect safety to both the mother and her tender infant.

In no part of our professional sphere, is the paramount value of anatomical knowledge more conspicuously shown than in medico-legal examinations. Unfortunately for the reputation of our calling, it often happens that men ignorrnt of this subject are called into courts of justice as witnesses, and so manifest is their deficiency that their testimony is set aside, and they get what they so justly merit—the contempt of the by-standers; were this all, they would receive their deserts, but the consequences do not stop here; for by their misconduct the honor of the noble profession they pretend to understand is degraded. Within my own knowledge, a case occurred in which one of these drones received the castigation he so richly deserved; in a trial for murder, a medical witness was asked where the phrenic nerve was situated? he believed it was in the neck, but with its locality he was unacquainted; the attorney of the opposite side availed himself promptly of this weak point in the case, for the medical examination was all important, had it been given by one acquainted with our subject, and he saved his client, but in the meantime so ridiculed medical testimony, and the ignorant doctor in particular, that well informed physicians have since been exceedingly annoyed in giving evidence before that bench.

Before I conclude my remarks, permit me to express the hope that the consideration of the subjects adverted to in this discourse may so stimulate the laudable ambition, which I have no doubt you possess, that you will increase your exertions to emulate the attainments of the honored men whose history I have attempted briefly to pourtray. Do not be discouraged if in the commencement of your researches you encounter difficulties, they can all be surmounted by patience and perseverance. Let not the idea that you are not blessed with the highest qualities of mind, depress you, for it often happens that those most richly favored with intellectual abilities, faint by the way; while those possessing less talent; but endowed with determination and industy, struggle on until they attain what will be the sure reward of all such--the highest honors of our profession.