Morgagni to Virchow : an epoch in the history of medicine : an address delivered 6th October, 1905, at the opening meeting of the Glasgow Medico-Chirurgical Society, session 1905-1906 / by John Lindsay Steven.

With the President's Compliments.

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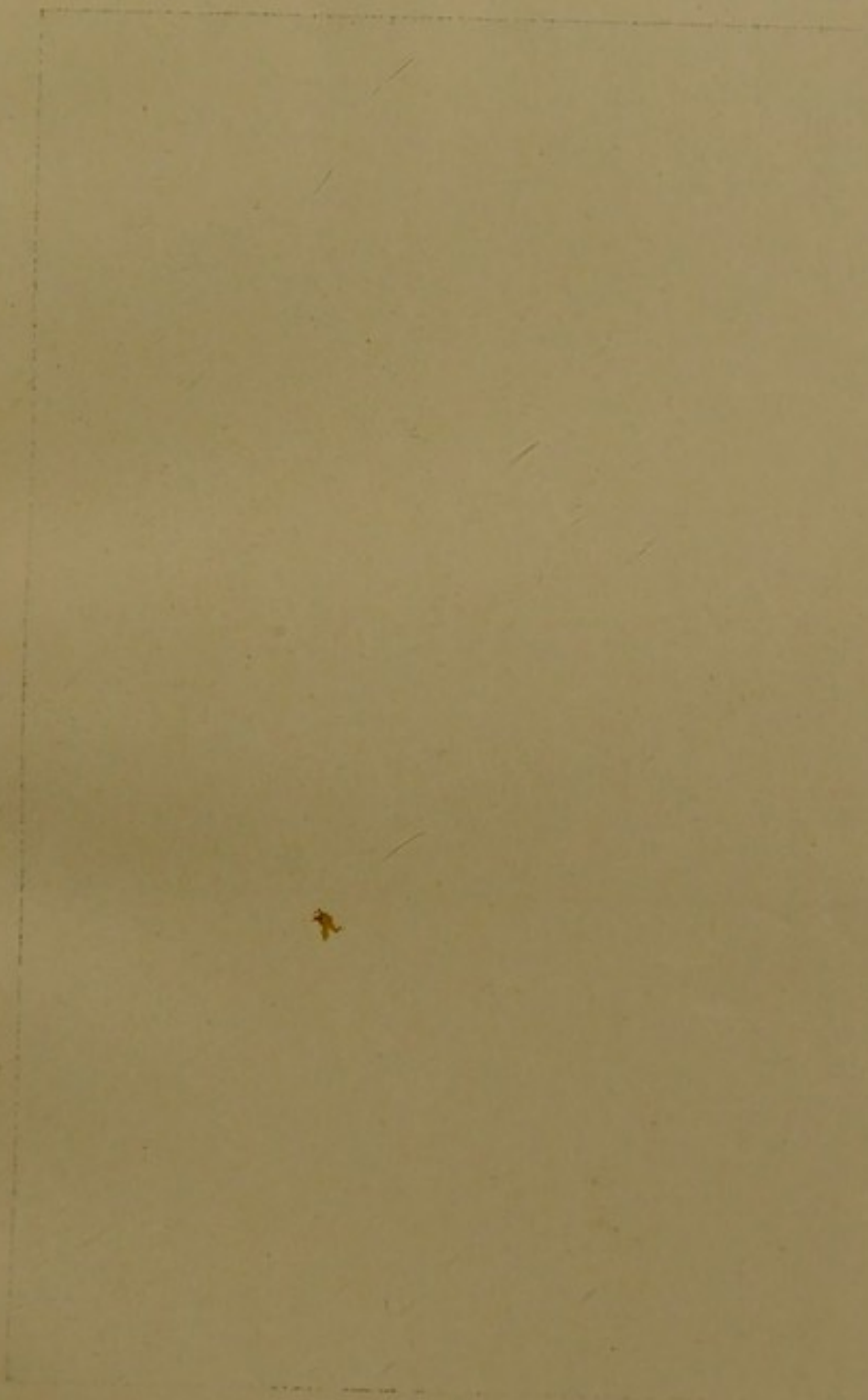
BY . . . . .

JOHN LINDSAY STEVEN,

M.D., F.F.P.S.G.



MORGAGNI.

1682] [1771

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MORGAGNI TO VIRCHOW:

AN EPOCH IN THE HISTORY OF MEDICINE.

DR. SAMUEL JOHNSON defines an epoch as "the time at which a new computation is begun; the time from which dates are numbered." In thinking over the portion of medical history to which I am about to direct your attention, I had chosen for my title "a chapter in medical history," but further reflection convinced me that the word epoch more accurately described the period. Epochs are the mile-stones of history, the finger-posts on the road of human progress. The history of medicine, like the history of the universe and of the human race, has had its epochs, and on one of these, as I believe it to be, I am about to address you. There are some who believe that the study of medical history is "but a melancholy study,"[1] a study of no instructive or practical use; with those I do not agree. It may be, indeed, that in the hurry and stress of modern life we have but little time to devote to the study, but that is our misfortune, a misfortune which has oppressed many studious spirits in times much less strenuous than our own. "We were hinted by the occasion, not catched the opportunity to write of old things, or intrude upon the antiquary. We are coldly drawn unto discourses of antiquities, who have scarce time before us to comprehend new things, or make out learned novelties. . . . 'Tis opportune to look back upon old times,

[1] *System of Medicine*, Clifford Allbutt (London, 1896), vol. i, p. ix.

and contemplate our forefathers."[1] So wrote Sir Thomas Browne at Norwich, in May, 1658. The study of medical history, the contemplation of our forefathers, is not a melancholy study, if it leads us to look back upon their labours with that charity which rejoices in their successes and sympathises with their failures; and as regards our own achievements, if it constrains us to regard them with modesty, and to think it possible that even we may be mistaken.[2]

Before passing on to speak in some detail of the work and influence of Morgagni, it is necessary that I should refer, however briefly, to the epochs in the history of medicine during the Christian era. Different students may form different opinions as to what constitutes a medical epoch, according to the view they take of what is important or fundamental in medical art and science. Thus, different views may be taken as to the value of the work of the men who may be regarded as the creators or representatives of an epoch. In general, however, agreement will be found to exist as to the great periods of progress. A useful table of the chief epochs of medical history from the time of the Argonauts, 1263 B.C., to the end of the eighteenth century, by the great German historian of the healing art, Kurt Sprengel, is to be found in his first volume. Having taken Sprengel's table as a guide, I have now to present to you the following brief statement of the great periods of medical history in the Christian era.[3]

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[1] *The Works of Sir Thomas Browne*, edited by Simon Wilkin, F.L.S. (London, 1852); *Urn Burial*, vol. iii, pp. 4, 5.

[2] "I beseech you, in the bowels of Christ, think it possible you may be mistaken," wrote Oliver Cromwell to the General Assembly of the Kirk of Scotland on 3rd August, 1650.—*Oliver Cromwell's Letters and Speeches*, Carlyle, in five vols. (London, Chapman & Hall, 1888), vol. iii, p. 18.

[3] *Versuch einer pragmatischen Geschichte der Arzneykunde*, von Kurt Sprengel (Halle, 1821), Erster Theil, S. 12; also, Jourdan's *Translation* (Paris, 1815), tome i, p. 12.

I. The Epoch of Galen (131–200 A.D.).

The influence of Galen on the actual practice of medicine lasted longer, perhaps, than that of any other practitioner of the healing art, not even excepting Hippocrates (459-377 B.C.), whom he and all physicians since have owned as master. The teaching of Galen, in its therapeutical aspects especially, appealed to the genius of the Arabian conquerors of eastern and southern Europe in the days of their victory and power. Under the fostering care of the caliphs the precepts of Galen dominated the practice of medicine down at least to the revival of learning in the fifteenth and sixteenth centuries. The practice of Galen and the logic of Aristotle fascinated the Mohammedan mind, and prevented their pupils from engaging in that study of Nature at first hand which was the glory of Hippocrates and of Greek medicine, as it is of the medical art of our own time. "But," writes Gibbon, "the human faculties are fortified by the art and practice of dialectics; the ten predicaments of Aristotle collect and methodize our ideas, and his syllogism is the keenest weapon of dispute. It was dexterously wielded in the schools of the Saracens, but, as it is more effectual for the detection of error than for the investigation of truth, it is not surprising that new generations of masters and disciples should still revolve in the same circle of logical argument."[1]

II. The Epoch of Mundinus (Mondino de Liucci) (1275–1326).

The period with which I have associated the name of this great man marks the beginning of the end of the Græco-Arabian supremacy, and the return of medical men to the study of Nature. "A superstitious reverence for the dead confined both the Greeks and the Arabians," says Gibbon, "to the dissection of apes and quadrupeds; the more solid and

[1] *The Decline and Fall of the Roman Empire*, edited by J. B. Bury, M.A. (London, 1898), vol. vi, p. 30.

visible parts were known in the time of Galen, and the finer scrutiny of the human frame was reserved for the microscope and the injections of modern artists."[1]

Sprengel points out that anatomy was the branch of medicine which was least cultivated by the Arabs. The practice of human dissection not only defiled the Mussulman, but was contrary to the dogmas of his religion, so that even the request of a physician for the permission of his priest to perform an autopsy was denounced as a violation of the law.[2] The genius of the Christian religion also was held to be opposed to human dissection. The Bull of Boniface VIII, *De sepulturis*, issued in 1300, prohibiting the Crusaders from evisceration, or cooking, or boiling any part of the human body, so that the bones might be sent home for burial in holy ground, also, though no doubt indirectly, operated against the practical study of anatomy.[3]

In the face of such almost insuperable difficulties throughout the middle ages the imperfect anatomy of Galen, which had been in no wise improved by the Arabians, had to serve. The great advance made by Mundinus was that he insisted upon the necessity of verifying the Græco-Arabian anatomy by direct appeal to human dissection. We cannot conceive the bravery of the man who in these days could venture to teach anatomy by demonstration on the human body. The "Anathomia" of Mundinus appeared in 1316. Numerous MSS. of the work are to found in the principal Continental libraries, and after the invention of printing in the middle

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[1] *Loc. cit.*, p. 32.

[2] Sprengel, Jourdan's *Translation*, tome ii, p. 262.

[3] "Dieselbe Behandlung erfuhr die Leiche des Kaisers selbst (Friedrich Barbarossa), als er im Flusse Saleph bei Jerusalem ertrank. 'Totum corpus in frusta sciderunt, et carnem ejus coxerunt, et ossa ejus extraxerunt, et carnes coctas sepelierunt in Antiochia cum cerebro et visceribus, ossa autem ejus secum tulerunt usque ad civitatem Tyri, et sepelierunt ea ibi' (Benedictus Petroburgensis, *Gesta reg. Henrici II.*, Lond. 1867, p. 566)." —*Geschichte der Medicin*, Haeser (Jena, 1875), third edition, vol. i, p. 736; also, *Medical History*, Withington (London, 1894), pp. 216-220; also, *History of Medicine*, Park (New York, 1899), second edition, p. 93.

of the fifteenth century it remained the favourite text-book till the time of Vesalius.

III. The Epoch of Vesalius (1514–1565).

Two hundred years after Mundinus we come to the next great epoch in the history of medicine, which must ever be associated with the name of Andreas Vesalius.

Vesalius was born in Brussels on 31st December, 1514, his family having been well known in the medical world for several generations. After a student career at Louvain, Paris, and Montpellier, Vesalius was appointed professor of anatomy at Padua in 1539, an office he held till 1546. In 1556 his scientific career ended, and he entered the service of Philip II at Madrid. In 1564, in fulfilment of a vow, he left Madrid, where his life had been rendered miserable by the envy of his colleagues and the hatred of the clergy, to visit Jerusalem. At Cyprus, on his way, the Senate of Venice again offered him the chair of anatomy at Padua, vacant since the death of Fallopius two years before. On his way back to take up the office he was shipwrecked on the 2nd October, 1564, on the island of Zante. Here, on the 15th October, 1565, in poverty and misery, he died, and was indebted to the generosity of a goldsmith of the place with whom he was acquainted for a simple grave in the church of the Holy Virgin at Zante (Haeser). So ended a great career.

At Bâle, in 1543, at the age of 29, Vesalius published his immortal work, *De humani corporis fabrica, libri septem* (On the Structure of the Human Body, in seven books), which he dedicated to the Emperor Charles V. The greatest of all the anatomists of the Renaissance, including such great names as Etienne, Eustachius, Columbus, his pupil and prosector, and Fallopius, Vesalius created his fame and established an epoch not so much by the number of his discoveries, as by the genius which led him altogether to break with authority, to push to one side the Galenical anatomy, and describe what he saw in actual dissection of the human body itself. Scoffed at by his master, Sylvius, and the other apostles of Galenical medicine, he gained the approbation of Fallopius and Ambroise Paré

(Withington); and through his influence on his prosector, Columbus, who demonstrated for him during his absence from Padua, he prepared the way for the greatest discovery of all, that of the circulation of the blood.

IV. The Epoch of William Harvey (1578–1657).

It is a commonplace to say that great men are the creations of the times in which they live. In a sense this is true of even so great a man as William Harvey. Great as was Harvey's discovery, the ground had been well prepared for it, from the time of Vesalius downwards, by many eminent anatomists whose names are now only to be found in the histories of medicine, or as eponyms applied to the structures of the human body which they had described. The valves in the veins had been demonstrated by various authors, whilst the pulmonary or lesser circulation was described in his *Christianismi Restitutio* in 1553 by Servetus,[1] the theologian,

[1] "Vitalis spiritus in sinistro cordis ventriculo suam originem habet, . . . Generatur ex facta in pulmonibus mixtione inspirati aëris cum elaborato subtili sanguine, quem dexter ventriculus cordis sinistro communicat. Fit autem communicatio hæc non per parietem cordis medium, ut vulgo creditur, sed magno artificio a dextro cordis ventriculo, longo per pulmones ductu, agitatur sanguis subtilis. A pulmonibus præparatur, flavus efficitur, et a vena arteriosa in arteriam venosam transfunditur. Deinde in ipsa arteria venosa inspirato aëri miscetur, expiratione fuligine repurgatur. Atque ita tandem a sinistro cordis ventriculo totum mixtum per diastolen attrahitur, apta suppellex, ut fiat spiritus vitalis . . . docet conjunctio varia et communicatio venæ arteriosæ cum arteria venosa in pulmonibus."—*Christianismi restitutio* (Viennæ, Allobrogum, 1553), pp. 170, 171; Haeser, *loc. cit.*, vol. ii, p. 245. For translations of this remarkable passage see *History of Physiology*, Foster (Cambridge, 1901), p. 24; also Withington, *loc. cit.*, p. 279.

Harvey, the physiologist, employs a more vigorous style than Servetus, the theologian, in pointing out that the communication between the right and the left sides of the heart is "non per parietem cordis medium." Harvey concludes his argument against pores or channels in the cardiac septum thus—"Sed me hercule porositates mullæ sunt, neque demonstrari possunt." But, by Hercules, there are no porosities, nor can they be demonstrated.—Harvey, *Exercitatio Anatomica* (Francofurti, 1628), p. 18.

who was sent to the stake by John Calvin. Under Fabricius ab Aquapendente at Padua, whither Harvey resorted, after five years at Cambridge, in 1599, and where he took his doctor's degree in 1602, all these discoveries would be brought to bear directly upon the thoughts and work of the English student. But like his great successor, Morgagni, the English physician was in no hurry to publish mere speculative results, and at the age of 50, after many years' patient experimental research and careful reflection, his great discovery was published at Frankfort-on-the-Maine in 1628, the title of the work being *Exercitatio anatomica de motu cordis et sanguinis in animalibus.* The publication was not made without arousing violent opposition in many quarters, and "to an intimate friend he (Harvey) himself complained that after his book of the circulation came out he fell considerably in his practice, and it was believed by the vulgar that he was crack-brained; all his contemporary physicians were against his opinion, and envied him the fame he was likely to acquire by his discovery."[1]

Vesalius and his colleagues shook to its very foundation the magnificent structure of Græco-Arabian Galenical medicine: Harvey brought it to the ground. The epoch-making discovery of Harvey was confirmed in 1661, four years after the discoverer's death, by the ocular demonstration of the circulation of the blood in the lung and mesentery of the frog by Malpighi, of Bologna (Withington, p. 302).

In this brief summary of the progress of medical science before the time of Morgagni, I have selected the names of the great anatomists to represent the epochs, because all sound advance in medical knowledge must be founded on exact anatomical knowledge. It must not be supposed, however, that these names represent all who in those early days contributed to the progress of our art. From the very beginning of the Christian era great clinicians have existed,

[1] *Lives of British Physicians* (London, 1857), p. 38.

whose descriptions of disease may be read with profit to this day, and whose therapeutical procedures are even now not without value. The names of the great Arabian physicians, Mesue, Rhazes, Avicenna, and others must ever live in the history of medicine. Guy de Chauliac (born about 1300), the junior contemporary of Mundinus, and surgeon to Clement VI at Avignon, is known as the "restorer of surgery." In the era of Vesalius, one of his greatest admirers was Ambroise Paré, whom we may regard as the father of modern surgery. Nor must I omit to mention in passing the name of Paracelsus (1490-1541), whose wild, tempestuous quackery has been regarded by many as evidence of the intellectual awakening that was going on in our art, but whom to call the "Luther of medicine" is quite obviously absurd.

V. The Epoch of Morgagni (1682–1771).

Morgagni's professional life extended over nearly three-quarters of the eighteenth century, a century characterised by great intellectual and literary activity, by great national and social unrest throughout Europe, and by the downfall of the great French monarchy. It was in the latter half of this century (1761) that a new epoch was to begin in the history of medicine; and that new methods were to be used in the investigation of the phenomena of disease. Again it was to be from the University of Padua that the new light was to come—Padua, already made famous by the labours of Vesalius, Columbus, Fallopius, Fabricius ab Aquapendente, and most of all by the discovery of its most famous graduate, William Harvey. The publication in 1761 by the Professor of Anatomy in Padua of his immortal work, *De sedibus et causis morborum per anatomen indagatis, libri quinque,* created an epoch in the history of medicine.

Up till the middle of the eighteenth century there was no scientific medicine. Morgagni created it. From the time of Vesalius and Harvey, scientific methods had been applied more or less consistently to the investigation and study of anatomy

and physiology. Harvey was a contemporary of Francis Bacon, and was doubtless influenced by his inductive philosophy. The *Novum Organum* was first published in 1620, eight years before Harvey's great work appeared; and the *Advancement of Learning* was issued from the press in 1605, three years after Harvey had taken his doctor's degree at Padua. While, therefore, it must be admitted that modern scientific methods of research were being applied to the study of anatomy and physiology, and even of surgery, it is equally clear that the inductive method had not reached the physicians. Great clinical observers as many of them undoubtedly were, they were still hopelessly at sea as to the right methods with which to approach the study of the nature and causation of disease. It is noteworthy that Sydenham never once mentioned the name of Harvey, and that "he spoke with great contempt of morbid anatomy."[1] Even the reformers among the physicians of those days would seem to have been what we now call "practical men," with all the practical man's contempt for the abstract and the non-obvious, rather than men of science. Sydenham, with all his practical commonsense, had not the insight to perceive the bearing of Harvey's discovery on the pathology and treatment of dropsy, on which he wrote a treatise. The physicians of Morgagni's day were on the whole more concerned about the establishment of systems of theory and practice, based on *à priori* principles, and the drawing up of systematic nosologies, than about the application of Baconian methods to their studies. According to Baglivi, one of the chief impediments to the progress of medicine in his day was "the preposterous reading of books, and the fatal itch of making systems: and the intermitting of the aphoristical way of treating diseases." All the medical systems of the eighteenth century were based on the faulty foundation of a mediæval humoral pathology; and the physicians strove, along with the philosophers, Locke, Descartes, Leibnitz, and others, to explain

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[1] *Thomas Sydenham*, by J. F. Payne (London, 1900), pp. 151, 233.

by dialectics the mysteries of life, disease, and death. As an aftermath of the ravings of Paracelsus, and as the result of the preaching by Van Helmont (1577-1644) of the doctrine of the Archeus as the presiding spirit in health and disease, there sprang up throughout Europe numerous schools or systems of medicine, which held sway right down to the time of Morgagni, with little profit to mankind. The doctrines promulgated by all of them were simply variations or modifications of the two fundamental ideas of ancient and mediæval pathology—humoralism and solidism. The iatro-chemical and iatro-physical schools, animism, vitalism, all had their loudly-disputing votaries, and the only gleam of sunshine in the whole murky, fuliginous atmosphere of doubtful metaphysics was the splendid clinical work of such men as Sydenham, Baglivi, and Boerhaave. The physicians as a body had still to learn that medicine is not a department of metaphysics or philosophy. They were still ruled by pure logic, notwithstanding Bacon's strong denunciation of the attempts to explain the phenomena of nature by means of the syllogism. "At nos demonstrationem per syllogismum rejicimus, quod confusus agat, et Naturam emittat e manibus." The conclusion of the great apostle of induction is "Rejicimus igitur syllogismum."[1] Such was the state of the practice of medicine when Morgagni began his life's work; how different was it a few years after his death!

Jean Baptiste Morgagni was born on 25th February, 1682, in the town of Forli, situated in a fertile plain about 40 miles east by south of the famous university seat of Bologna. While the future anatomist was still a child of 7 years old his father died, but his education was successfully conducted by his mother. From this it may be gathered that his parents must have been in easy circumstances. After the usual school training in classics and philosophy, he proceeded, at the age of 16, to study medicine at the University of Bologna, under Albertini and Valsalva. In the year 1701, at the age of 19, Morgagni

[1] *Franc. Baconis Novum Organum Scientiarum*, editio secundo (Amstelædami, 1660), pp. 4, 5.

received his doctor's degree, and became assistant or prosector to his master Valsalva, who was then engaged in his important work on the anatomy of the ear, and to whom the young doctor rendered valuable assistance by his skill in dissection. During the absence of Valsalva on a visit to Parma, Morgagni delivered the anatomical lectures, and laid the foundation of his future reputation as an eloquent and successful teacher. Soon after this, he sought to finish his professional education by travel. In the pursuit of his studies he visited Venice and Padua, and then he settled in private practice in his native town of Forli. The monotonous routine of ordinary general practice, however, did not satisfy him, and on the advice of some of his former teachers he returned to Padua, where in 1711, at the age of 29, he was appointed junior professor of anatomy in succession to Vallisneri. In 1715 he became first professor of anatomy in the university, an office which he filled with great credit and acceptance till his death on 6th December, 1771, in his ninetieth year. Morgagni married Paola Verzeri, a lady of noble family in Forli, by whom he had twelve daughters and three sons. Eight of his daughters became nuns—a goodly contribution to the church. Of his sons, one died in his second year, another became a Jesuit priest, and the third settled in Forli and died at the age of 52. Eight of the great anatomist's family sur ived him.

Such is a brief outline of the life of this great anatomist —a quiet and uneventful life as regards those elements which excite the popular curiosity and call forth the applause of the multitude, but a life of the greatest value and importance when we think of the untiring labour and study which it comprised, and of the lasting benefits it has conferred on succeeding generations of men. It is pleasing to think, however, that Morgagni received during his lifetime very substantial recognition of the value in which his labours were regarded by those well fitted to judge of the merit of the work in which he was engaged. The Royal Society of London, the Royal Academy of Science in Paris, the Imperial Academy of St. Petersburg, and the Royal Academy of Berlin enrolled him among their honorary members. In addition to the recognition of his fellow-labourers in the field of science,

he also received substantial marks of esteem from the King of Sardinia, the Emperor Joseph II, and three successive Popes. The latter is not perhaps so much to be wondered at, when we remember that he gave eight daughters and one son to the service of the Holy Catholic Church, and was highly regarded by Lancisi, body-physician in succession to Innocent the XII and Clement the XI. His fellow-townsmen also combined to do him honour, and during his lifetime his bust was placed in the town hall of Forli. A statue of Morgagni was unveiled at Forli on 27th May, 1875 (Virchow).

The Writings of Morgagni

comprised works upon the history of medicine and upon archæology as well as upon anatomy and pathology. It is with the latter, however, that we are now concerned, and by which he is best known to us. His writings on anatomy were comprised in a series of volumes, which he called *Adversaria Anatomica*, six in all, which were published between the years 1706-1719. These writings comprise descriptions of almost all the structures and organs of the body, and corrected the errors which had crept into the works of preceding and contemporary anatomists. The errors which Morgagni had to confute seem to us to-day to be self-evident, but we must remember that we are the heirs of the labours of our fathers, and be lenient in our judgment and criticism. As an example, it may be mentioned that some anatomists believed that the tracheal cartilages were perfectly circular, an error which Morgagni had to correct.[1] Manget thought that the subcutaneous fat was contained in vessels, and quoted the great name of Malpighi in support of this. Morgagni not only showed that Malpighi had in a later communication departed from this view, but stated his belief that the fat transuded into the cells of the cellular tissue from the extremities of the arterioles—an opinion not so very far

[1] *Adversaria Anatomica*, I, p. 32; also V, p. 45.

wrong, as we now know.[1] Morgagni "believed only that which his reason approved, and his reason he always subordinated to experience and observation."

It is necessary now to refer briefly to the greatest of all Morgagni's works, the *De sedibus et causis morborum per anatomen indagatis, libri quinque* (The Seats and Causes of Diseases Investigated by Anatomy, in five books), published in two volumes in Venice in 1761. Observe the date, 1761. Morgagni was 79 years of age—surely he must have been an extraordinary man who, at a time when most consider that their life's work is done, could give to the world a book which will live as long as the medical art itself. The work took the form of a collection of letters, which he directed to prominent physicians. He chose this form because it appeared to him the most convenient in which to explain in an untrammelled manner the different relationships of all the phenomena described. The first book dealt with the diseases of the head; the second, the chest; third, the abdomen; fourth, external and surgical affections; fifth was a supplement to all the others. Morgagni's book differed from all that had preceded it mainly in this, that he set himself definitely to explain the symptoms during life by the morbid changes which were shown to have taken place after death. He himself was modest enough to regard it as a mere continuation of the Sepulchretum of Bonetus. But it was far more than this. The Sepulchretum was often a mere collection of curiosities and monstrosities, of what were regarded as peculiar and out of the common rule, and frequently normal were mistaken for abnormal conditions. Morgagni set himself definitely to bind together as intimately as possible the results found in the dead body with the symptoms observed during life, so as to obtain a complete picture of the disease. He followed the ancient symptomatological rules, adding to them pathologico-anatomical explanations. The work is on this ground not in the least a handbook of pathological anatomy in the modern sense, but rather a

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[1] *Adversaria Anatomica*, III, p. 3.

répertoire of pathologico-anatomical explanations of medical symptomatology. The greatest ornament of the work is the rare modesty which is displayed on every page—a sure sign of the greatness of the man, and an earnest of his pure and unwavering devotion to the service of science and truth (Haeser). "It is difficult," writes Sprengel, the great German medical historian, "to say whether one should admire most his rare dexterity and quickness in dissection, his unimpeachable love of truth and justice in his estimation of the work of others, his extensive scholarship and rich classical style, or his downright commonsense and manly speech. From every point of view Morgagni stands alone as an almost unattainable example to modern medical men." The plan of this great work is fully set forth by the author himself in his preface, which is easily available to readers of the present day in Dr. Alexander's literal translation. In two places he refers to his great labour and his advanced years. He expresses his hope that he may be excused by all reasonable men from undertaking the labour of preparing proper indices for the Sepulchretum, because "at my time of life, and without anyone to assist me, even a pupil or an amanuensis," he had not the leisure. Again, in reference to the *De sedibus*, he says, "I am so far advanced in life that all these parts of the work, after being revised with the utmost diligence I was capable of, at length came abroad into the world almost in the eightieth year from the time in which I was born." He has completed four different indices to the book, which are models of accuracy and completeness, and by means of which these large folios may be consulted without difficulty.

What Vesalius and Harvey did for the study of anatomy and physiology, Morgagni did for the study of pathology and practical medicine. As the labours of the former shattered the dogmas of the Græco-Arabian medicine, so the patient lifelong work of the modest professor at Padua gave the deathblow to the great metaphysical medical systems of the eighteenth century, and started the practice of medicine on a new and glorious career.

The Contemporaries of Morgagni.

It is necessary that a few words should now be said of the great contemporaries of Morgagni, who were engaged along with him in placing the practice of medicine on a scientific foundation. I have already said that the eighteenth century was one of great intellectual activity, and this is true as regards the workers in the domain of medicine as in the other departments of human knowledge. Among the chief scientific men of the century must be placed Albrecht von Haller, of Berne (1708-1777), the most eminent physiologist since William Harvey. Haller was probably the greatest natural genius amongst the physicians of the eighteenth century, and his industry was enormous. He was distinguished not only as a physiologist, but also as a botanist and a poet, as well as a bibliographer. The ultimate living element of the animal body he believed to be a jelly developed by the vital process from oil and water.[1] This jelly he called "gluten" or "glu," a name which he probably borrowed from the teaching of his great master Boerhaave, who described in his *Aphorismi*, "Morbi a glutinoso spontaneo."[2] Perhaps, however, Haller's greatest work was contained in his two momoirs entitled *Sermones de partibus corporis humani sentientibus et irritabilibus*, communicated to the Royal Society of Göttingen in 1752. In his work on the liver, published in 1654, Glisson, of Cambridge, first developed the idea of "irritability" as a vital force. "It is undoubtedly to Glisson that we owe the first introduction, not only of the word, but of the idea of 'irritability,'" says Sir Michael Foster.[3] This is true, but it was Haller who, one hundred years later, by experimental research, the results of which were contained in the memoirs noted above, proved the

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[1] Haeser, *loc. cit.*, vol ii, p. 571.

[2] Boerhaave, *Aphorismi*, edited by Kaltschmied (Leipzig and Frankfort, 1758), p. 36.

[3] *History of Physiology* (Cambridge, 1901), p. 289.

truth of what to Glisson was little more than a theory largely based on *à priori* considerations, and made it part of the physiology of our time. He distinguished between sensibility and irritability, he recognised a *vis insita* as inherent in all "irritable" tissues, and a *vis nervosa* by which the *vis insita* is most frequently called into play.[1] In this way Haller materially advanced the science of physiology. To Haller Morgagni dedicated his *Opuscula miscellanea*, Pars Prima (Neapoli, 1763).

In Great Britain, during the latter part of Morgagni's life, valuable and lasting work was being done by three Scotsmen —William and John Hunter in London, and William Cullen in Glasgow and Edinburgh. We in Glasgow have a right to be proud of these three men; all were born in Lanarkshire.[2] Cullen was a Fellow of our Faculty, and began his teaching career in Glasgow; William Hunter was enrolled an Honorary Fellow on 4th March, 1751, and left his great museum and library to the University of Glasgow. In anatomy, in surgery, in natural history, and in clinical medicine, these men did glorious work, and were animated by the same spirit as Morgagni. Cullen may be regarded as the last of the great systematic physicians of the eighteenth century, struggling against the thraldom of the humoral pathology, although his *Nosology*, greatly celebrated in its day, is now only of historical importance.

Perhaps, however, one of the most striking illustrations of the intellectual awakening, which was taking place amongst the medical men of Europe in the eighteenth century, is to be found in the work of Joseph Leopold Auenbrugger (1722-1809), the discoverer of the method of percussion. The writings of Morgagni and Haller are contained in many and large volumes, the work of Auenbrugger, entitled *Inventum novum ex percussione thoracis humani ut signo abstrusos interni*

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[1] Foster, *loc. cit.*, pp. 292, 293.

[2] For the connection of William Hunter and Cullen with Glasgow, consult Duncan's *Memorials of the Faculty of Physicians and Surgeons of Glasgow* (Glasgow, 1896).

pectoris morbos detegendi, published in 1761, the same year in which the *De sedibus* saw the light, is a mere *brochure* of ninety-five pages, which, says Park, "unsaleable in his time, is to-day held worth far more than its weight in gold."[1] Yet the influence of this small work on the department of medicine with which it deals has been as great as that of any medical work that ever was written. The library of the Faculty of Physicians and Surgeons is happy in the possession of a copy of the rare first edition, which, according to Haeser, is "von grösster Seltenheit."[2]

The Successors of Morgagni.

We have now to trace the influence of Morgagni on the work of the men who endeavoured to carry out in practice the great principle which he established. This can, perhaps, best be done by glancing at the work of the French, the British, and the German physicians who followed him.

In France, the first on whom the mantle of Morgagni fell was Marie Francois Xavier Bichat, who was born at Thoirette (Department Jura) in 1771, the year in which the great professor of anatomy at Padua died. The untiring energy of the young French physician, an energy characteristic of the stirring times in which he lived, led, in 1802, to his early death from a putrid fever, probably the result of a dissection wound, at the age of 31. Bichat founded the modern science of histology, and "he differentiated without the aid of the microscope twenty-one different tissues as simple and similar elements of the body."[3]

The work, perhaps, by which Bichat is now chiefly remembered is the *Recherches physiologiques sur la vie et la mort*, which was first published in 1800. The book is animated throughout by the modern scientific spirit. He divides life

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[1] *Loc. cit.*, p. 211.

[2] *Loc. cit.*, vol. ii, p. 638.

[3] Roswell Park, *loc. cit.*, p. 209.

into two remarkable modifications—*la vie organique*, common to plants and animals; and *la vie animale*, characteristic of animals alone. The following sentence from the book shows well the spirit with which he approached the subject:—"Dans l'étude des forces de la vie, il faut remonter des phénomènes aux principes, et ne pas descendre des principes aux phénomènes."[1] The day after his death Corvisart wrote to Napoleon—"Bichat has just fallen on a battlefield which numbers more than one victim. No one has done so much and so well in so short a time."[2]

Ten years after the death of Morgagni there was born, in 1781, at Quimper, in Brittany, René Theophile Hyacynthe Laennec, who in a short life of 45 years accomplished a stupendous work, which not only founded, but brought to great advancement, the science of the physical diagnosis of disease. Auenbrugger and Laennec have done more for practical medicine and physical diagnosis than any other men. The work of Laennec was animated throughout by the spirit of Morgagni. By the most careful and untiring work in the *post-mortem* theatre, he always endeavoured to verify his clinical observations by the most accurate investigation of the changes met with in the organs after death. In 1874 Gairdner wrote of Morgagni as follows:—"I claim not only the professed and exclusive morbid anatomists, but also, and still more, almost all the greatest physicians and surgeons of our own and the last century, as the legitimate successors of Morgagni and the inheritors of his method of working. Without him we should probably have waited much longer for Laennec, and might very probably have been at this hour without the stethoscope and all that it has brought us."[3] Not only did Laennec discover the stethoscope, he was also the first to describe in its true relationships and significance the nature of tubercle.

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[1] *La vie et la mort*, Paris, An. XIII, 1805, p. x.

[2] Withington, *loc. cit.*, p. 359.

[3] "The Progress of Pathological Science: John Baptist Morgagni and his Successors," *British Medical Journal*, 24th October, 1874, vol. ii, p. 515.

It is unnecessary to do more than to name Corvisart, Bayle, Louis, Bretonneau, and Cruveilhier, to prove that the French school of the beginning of the nineteenth century fully entered into the spirit and labours of Morgagni.

In Great Britain the immediate influence of Morgagni's teaching fell first of all upon Matthew Baillie (1761-1823), a nephew of the Hunters and of Joanna Baillie, the poetess. In 1793 Baillie published *The Morbid Anatomy of some of the most important parts of the Human Body*, a work which went through five English editions up to 1818, and was translated into French, German, and Italian. In his preface, Baillie complains that in the "works explaining morbid anatomy which I have seen" there are two faults—(1) a want of accuracy, and (2) a too great attention often to trifling collateral circumstances. He goes on to say—"Both of these faults too frequently occur, even in the stupendous work of Morgagni de causis et sedibus morborum, upon which, when considered in all its parts, it would be difficult to bestow too high praise."[1] We can forgive Morgagni his faults, and excuse the faint praise of Baillie, when we observe that the critic has misquoted the title of the Paduan professor's book. Baillie's book may be described as the first systematic treatise upon pathological anatomy in the English tongue, and it was valuably supplemented by the publication of an *Atlas of Morbid Anatomy* between the years 1799 and 1802. Later in life Baillie rivalled Sir Henry Halford as the leading consulting physician in London.

It is unnecessary to refer in detail to the successive physicians and surgeons of our own country, who pursued their labours in the spirit of Padua. Suffice it to say that work carried out in this spirit led to the discovery of the relationship of albumen in the urine to organic disease of the kidneys by Richard Bright; to the splendid clinical work of Addison, Stokes, Graves, Allison, and Hughes Bennett; and to the investigations—in which Perry, of Glasgow, had a

[1] *Morbid Anatomy*, fourth edition (London, 1812), p. ix.

considerable part—which finally led to the distinction of typhus from enteric fever.

The influence of Morgagni was perhaps longer of being felt in Germany than either in France or Great Britain. For this delay there are, according to Haeser, several reasons.[1] The chief perhaps was the hold that the Brunonian system had upon the German professional mind. There is perhaps no more peculiar phenomenon in the whole history of medicine than the enormous influence which the doctrine of life, being the result of the action of stimuli on the "excitability" of the body, as promulgated by Dr. John Brown, the dissolute classical scholar who translated Cullen's works into Latin, exerted on professional thought, more especially in Germany and Italy. According to Brown's doctrine, "diseases are due either to excessive or deficient excitement (*i.e.*, life), and are termed sthenic or asthenic, according as they arise from the former or latter cause."[2]

No advance towards scientific medicine could be looked for in schools where such a theory was seriously adopted and taught, and so it was practically not until the time of Virchow and his immediate predecessors and teachers that the influence of Padua was felt in Germany. But the mention of Virchow reminds me that my present task is almost done. With the work of Virchow, of Pasteur, and of Lister, a triple alliance full of the brightest promise for the welfare of mankind, a new era has commenced, the end of which we cannot see, and our proximity to which is too close to enable us to form an impartial opinion as to its true place and value in the history of medicine. The publication of the *Cellular Pathology* in 1858 sufficiently marks the beginning of the newer impulse. The cell doctrines of Schleiden and Schwann (first promulgated in 1837 and 1838[3]) were being vigorously studied and applied by anatomists and physiologists all over Europe

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[1] *Loc. cit.*, p. 907.

[2] Withington, *loc. cit.*, p. 352.

[3] Pagel, *Geschichte der Medicin* (Berlin, 1898), p. 346.

when Virchow was a student in Berlin (1839-1843). In this country the work of Goodsir (of Edinburgh) and Redfern (of Belfast) must ever rank as of the highest importance in cellular physiology and pathology. "Was Wunder, sagt Virchow in einer Erinnerung an jene Zeit, wenn wir Jüngeren frühzeitig cellular denken lernten."[1]

As is always the case in medical history, the way had been prepared for Virchow, but to him belongs the honour of having started our present-day pathology on its course. From whatever point of view we regard him—whether as a pathologist, a physician, an anthropologist, or a statesman—Virchow must always stand as one of the greatest representative men of the nineteenth, as Morgagni was of the eighteenth, century. Of Virchow's opinion of Morgagni and his work, we have an excellent expression in the eloquent address he delivered before the Eleventh International Medical Congress at Rome, on 30th March, 1894, entitled "Morgagni und der anatomische Gedanke." The guiding star in all Morgagni's work was "der anatomische Gedanke"—the anatomical idea or concept—an idea which, I think, has yet to carry us far. "Some diseases," wrote Matthew Baillie, "consist only in morbid actions, but do not produce any change in the structure of parts; these do not admit of anatomical inquiry after death."[2] Virchow, in the address just referred to, gives expression to the same opinion. "Aber die pathologische Anatomie ist ausser Stande, für jede Krankheit eine Sedes nachzuweisen. In dem grossen Gebiete der Nervenkrankheiten und selbst in dem der Vergiftungen giebt es zahlreiche Fälle, in welchem die anatomische Untersuchung insufficient ist."[3] Notwithstanding these weighty opinions, I think we are not yet quite done with the anatomical idea in medical investigation. With our modern methods of physical research, our differential

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[1] Becher, *Rudolf Virchow* (Berlin, 1894), pp. 3, 5.

[2] *Loc. cit.*, Preface, p. iii.

[3] *Morgagni und der anatomische Gedanke* (Berlin, 1894), p. 21.

staining reagents, our immersion lenses of great magnification, and our culture media, we are now enabled to locate the seats of diseases in altered structure of parts so minute, in affections of the nervous system, and in diseases due to poisons, that it is not surprising that even Virchow, so recently as 1894, should have thought that for these diseases "die anatomische Untersuchung insufficient ist." But it is not so; the microscopic morbid appearances in nerve cells and blood corpuscles, which are now being revealed to us as the seat of these apparently functional or toxic diseases, prove that the anatomical idea is still guiding our researches. With Morgagni the anatomical concept originated, and it guided him through his long and lonely study of the seats of diseases. Let me conclude by saying with Virchow, "Ihm sei die Ehre!" To him be the honour.

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