the Medical Society of London
with the sincere wishes for a
future welfare of their Med Soc.
The Author.

A

LECTURE

INTRODUCTORY TO THE STUDY

OF

ANATOMY AND PHYSIOLOGY,

DELIVERED BY

HENRY WILLIAM DEWHURST,

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ON MONDAY, OCTOBER 1, 1827,

AT THE

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MDCCCXXVII.

TO

SIR ASTLEY COOPER, BART. F.R.S.

SURGEON TO THE KING, GUY'S HOSPITAL,

&c. &c.

THIS LECTURE

Is respectfully Dedicated,

AS A SMALL TESTIMONY OF ESTEEM FOR HIS FRIENDSHIP AND GREAT PROFESSIONAL ABILITIES,

BY

HIS OBEDIENT SERVANT,

THE AUTHOR.

October 2, 1827.

Theatre of Anatomy,
21, SIDMOUTH-STREET,
Gray's Inn Lane.

INTRODUCTORY LECTURE, &c.

GENTLEMEN,

I HAVE the honour this day to commence our Autumnal Course of Lectures on Anatomy, Physiology, and Surgery. Anatomy signifies the art of examining animal bodies by dissection, in order to demonstrate their shape, structure, connexion, and situation of the parts; this, though it does not teach us the remedies of a disease, leads us to understand the situation of the diseased parts, and the influence of disease on their functions. It teaches us the structure and functions of the different organs composing the animal body, and shows us nearly on what life and health depends. In short, whatever perfection the art of healing might have arisen to, by the aid of practical experiments and observations, there is no person can deny, that its greatest improvements have been derived from Anatomy and Physiology.

The human body, in a state of nature, is liable to but few diseases, when compared to that portion of mankind in a state of civilization: the luxuries they enjoy, and the inactive life often led by the more wealthy part of the community, causes a disturbance of the more important functions of the animal economy, and thus a foundation for disease is laid, requiring the care, skill, and attention of the medical practitioner.

By the sciences of Medicine and Surgery, we are frequently enabled to enjoy the gratification of relieving our fellow-creatures from the agony of disease, either by the aid of internal remedies, or by the more scientific skill of a surgical operation. The monarch and the peasant, the conqueror and the conquered, would soon "*go to that bourne from whence no traveller returns*," and his senseless clay return to its mother earth, either from an oppressed brain, or from an hæmorrhage arising from a wounded artery, were it not arrested by the skill of the medical attendant;—without his aid, the kingly palace and the downy bed would create but a short-lived happiness.

I shall now rapidly proceed to give you an outline of the formation of the human body, which will be in fact an *outline* of the Course of Lectures to be delivered by myself and colleague, in this Theatre. The sciences of Anatomy and Physiology are, strictly speaking, completely united together, and are inseparable: yet I must say I feel rather surprised to find that they have been divided into two separate branches of medical education by the late Dr. Gordon, of Edinburgh[a], of whose talents I entertain the highest

[a] This system is adopted by the Editor of the London Encyclopædia, *see* vol. ii. part i. p. 174.

respect. Such a division, however, is arbitrary, and cannot be maintained. Of what use would it be to the student for an anatomist to describe the structure of any particular organ, without at the same time informing him of its use? This division may do very well for Encyclopædias, as far as the editor is concerned; by this means he is enabled to make two articles for his work instead of one; and as respects the reader, is liable to the same objection as the medical student. I cannot but reprobate any such arrangement, and recommend the pupil to bear in mind, that Anatomy and Physiology go hand in hand together, and as such must be studied. Although the Lectures on Anatomy will take place every afternoon in this Theatre, in which the structures and functions of each particular organ will be explained,—yet, as it is the functions that are disturbed in disease, I deem it necessary to give you a separate Course of Lectures on Physiology, in which I shall more minutely enter on the subject. Here, Gentlemen, let me advise you to pay particular attention to this branch of study, as you will be enabled to appreciate its value when you enter on the important duties connected with practice.

In the Anatomical Lectures you will gain a comprehensive idea of the whole body; for the parts are displayed, their functions in the healthy state, and the importance of particular structures, are adverted to, with the changes which they undergo from morbid actions or from accident. Thus a groundwork of physiological and pathological knowledge is gained, while the student is enabled to pursue his anatomical labours with pleasure. But I must impress upon your attention, that although the Lectures will give you a theoretical knowledge, yet they are only calculated to give you general ideas; and it is from actual dissection that you must acquire practical information, *and this must be minute.* It is necessary that you should know the exact course of the principal arteries; for you know not how soon you may be compelled to tie them, and that your scalpel may give health or death to a patient, within the space of a hair's breadth. It will be of no use for a pupil to enter an Anatomical Theatre or Dissecting Room, for the purpose of obtaining anatomical information, who has a dislike to the smell or handling a dead body: such a man had better leave the profession at once, than endeavour to learn it by studying splendidly illustrated anatomical books. 'Tis true that these, combined with *actual dissection*, prove a powerful auxiliary; for if a man enters practice without a knowledge of Anatomy, he is like a ship at sea without a rudder or sails; there she buffets about on the briny waves, until the crew perishes either from hunger, or the ship is wrecked. The lives of his fellow-creatures are placed in jeopardy, and not unfrequently are sacrificed to his ignorance. Yet, Gentlemen, I am sorry to inform you that, even in this metropolis, there are men following what is called *an excellent practice*, who know nothing of Anatomy—whose plan of treatment is empirical; they have a universal medicine for all disorders, and kill or cure is the result. This is lamentable; and I hope such will never be your case. Follow your professional studies with zeal,—obtain for yourselves an excellent knowledge of your profession; you need not then fear the result; confidence will be placed in you, and you will be equally honoured and respected. I have now endeavoured to impress on your minds the necessity of obtaining a knowledge of the fundamental branch of your medical education; and, to use the words of that excellent surgeon and anatomist, Mr. Lawrence,—"*Anatomy and Physiology are the groundwork of Pathology, or the science of disease.*"

"*Thus we find Anatomy, Physiology, Morbid Anatomy, and Pathology, are mutually related and intimately connected. Although called separate sciences, they are, in truth, parts of one system; and we must never lose sight of their mutual bearings. On the foundation of these four departments of knowledge or science, is raised the practice of medicine, or the healing art; overlooking the artificial distinctions of physic, surgery, and so forth*[b]."

The human body is divided into solids and fluids: this division is correct, and at the same time convenient, as by it I shall describe the outline of the human body in a few words; and first exhibit a table[c] of the general component parts of an animal. I shall commence with the solids;

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[b] Lectures on Physiology, Zoology, and the Natural History of Man. Delivered at the Royal College of Surgeons, by W. Lawrence, F. R. S. p. 56.

[c] A TABULAR VIEW OF THE COMPONENT PARTS OF AN ANIMAL BODY.

1. *Solids.*	2. *Fluids.*
Bones.	Blood.
Cartilages.	Perspirable matter
Ligaments.	Sebaceous matter.
Membranes.	Urine.
Cellular substance.	Ceruminous matter.
Adeps, or Fat.	Tears.
Muscles.	Saliva.
Tendons.	Mucus.
Arteries, Veins, and Nerves.	Serous Fluids.
Thoracic and Abdominal Viscera, &c.	Pancreatic Juice.
Glands.	Bile.
The Brain and Spinal Marrow.	Gastric Juice.
Nerves.	Oil.
	Synovia.
	Semen.
	Milk.

The Anatomical Description of the Body is arranged under the following heads:—viz.

Osteogeny, or doctrine of the Formation of Bone.

Osteology	Anatomy of the Bones.
Syndesmology	Ligaments.
Myology	Muscles.
Angiology	Arteries, Veins, Absorbents.
Adenology	Glands.
Splanchnology	Thoracic and Abdominal Viscera.
Neurology	Brain, Nerves, and Organs of Sense.

The Principal Functions of the Human Body.

Digestion, Absorption, Respiration, Circulation, Secretion, Irritability*, Sensation, and Generation.

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* Irritability is the principle by which living fibres contract, in which absorption and circulation exist, and which is more or less excited by the occasional exertion of the muscular powers.

and the bones first demand our attention, These organs are the firmest of the solid parts, and form the frame-work, or props, on which the great superstructure is laid. The cavities formed by them protect the vital organs; for example, the cranium contains the brain, the thorax contains the centre of the vascular, and the whole of the respiratory systems. In the fœtus, they are scarcely formed; at least taking the long cylindrical bones, as a specimen, we shall find that only a portion, about four-fifths, are ossified, while the remaining portions, situated at their extremity, are cartilage. The bones during the early periods of our existence, are highly vascular, and may be injected to a surprising degree of minuteness; this vascularity is necessary, in order that the secretion of bone may take place, which is seldom entirely completed until the age of puberty [d].

The whole skeleton contains about 248 bones, the structure of which is symmetrical; for if an imaginary perpendicular line is drawn through, the whole would divide, even the single bones, into a right and a left half, exactly resembling each other. This observation must, however, be taken with some allowance, since the corresponding bones of one side are not always perfectly similar to those of the opposite; nor do the two halves of the single bones always agree in form, &c.

The entire skeleton of a man of middle stature, in a dried state, (similar to the specimen before you) weighs from 150 to 200 ounces; that of a woman from 100 to 150 ounces.

Attached to bones, are a set of organs, denominated cartilages, which are of a milk-white or pearly colour, half transparent, and holding a middle rank, in point of firmness, between bones or hard parts, and the softer constituents of the human frame; but these are not peculiar to the bones themselves; they are found in other parts of the body. 1st. Those attached to the ends of bones in the fœtus, *and supplying the place of bone*, which afterwards becomes ossified. 2ndly, Those attached to the articular ends of bones, by which means they are enabled to move on each other, without any danger arising from the effects of friction. 3rdly, Those supplying the place of bones in the adult, and where the existence of such organs would be found inconvenient, as the cartilaginous rings of the trachea; those cartilages connected with the organs of voice: the sternal extremities of the true and false ribs; &c. 4thly, The interarticular cartilages, found within the articulations: examples are seen in the knee joint, between the condyloid processes of the lower jaw, with the glenoid cavities of the ossa temporalia, &c. The cartilages are not very sensible in a healthy state, but like bones are much so when diseased. The uses of which are to prevent that concussion, that would necessarily arise from the various movements of the joints, and the occupations connected with them.

Bones are united together by two species of connexion. 1. Where the edges of one bone are received in cavities formed for its reception in another, by means of serrated margins, as in the sutures of the cranium, and of the face [e]. 2dly, Where there is a connecting media, as by

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[d] Bones have been analysed by Berzelius, Fourcroy, and other eminent chemists; and are found to be composed of 90 parts; 63 parts of phosphate of lime, 23 parts of gelatin, 2 parts of carbonate of lime, and 2 parts are lost in its examination.

[e] The species of suture uniting the bones of the face is called *harmonia*.

ligaments. This apparatus consists in merely condensations of cellular substance, assuming a fibrous appearance, and are attached to the ends of bones, thus connecting them together; they have various denominations assigned to them, according to their situations: it is in consequence of lacerations in these membranes, caused by violence, that dislocations are produced.

The opposed surfaces of bones, which form the joints, are covered with a beautiful thin crust of cartilage, most exquisitely smooth and polished. They move on each other in whatever direction their structure admits, without any hindrance from friction. The ligaments connect these portions of the bones together, and restrict their motions to certain directions. In order still further to promote the facility of motion, and to obviate every possibility of friction, the cartilaginous surfaces are smeared with an unctuous fluid, called synovia, by anatomists, and by the butchers *joint-oil;* which makes them perfectly slippery[f]. This fluid is confined to the surface of the joint by means of the capsular ligament of the joint. It is secreted from portions of a fatty substance, called the synovial glands.

The membranous tissue[g] is merely a series of laminæ of interwoven and condensed cellular substance, closely attached to one another, so as to give it a uniform appearance. Physiologists have divided this tissue into serous, mucous, and enveloping membranes. The first secretes serum; an example is seen in the pericardium, which secretes a fluid, denominated the liquor pericardii, &c. The schneiderian membranes secrete the mucous of the nose; and the enveloping membranes are called *fascia* or *aponeuroses*, when covering muscles, *periosteum*[h] when covering bones, &c. The cellular tissues are composed of laminæ of animal substance more loosely connected, and forms the general uniting medium of all the structures in an animal body. If you wish to observe a good demonstration of this structure, I cannot do better than advise you to notice the first butcher's shop you pass, and look at a shoulder of mutton, and you will perceive the cells composing this tissue, of a beautiful white colour, inflated with air, for the butcher, previous to his skinning the animal, makes an incision into the *axilla*, and applying his mouth to the orifice, inflates the cells with air from his lungs; this is done in order to give a whitish appearance, which they suppose adds considerably to the beauty of the meat. The adipose substance next demands our attention, and is contained in the cells of the cellular membrane, in a state of fluidity, that is to say, it is of the consistence of oil.

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[f] From the analysis of M. Margueron, it appears that Synovia is composed of the following ingredients:

Fibrous matter	11.86
Albumen	4.52
Muriate of soda	1.75
Soda	.71
Phosphate of soda	.70
Water	80.46
	100.00

[g] Membranes of animals consist of concrete gelatin, and are like skins, convertible into leather by tanning.

[h] The periosteum in most animals is of a whitish yellow colour; in the silken fowl it is black, and in the guard fish it is green.

Muscles[1], in popular language termed flesh, consist of bundles of red fibres; but the colour is not essential, since it may be removed by repeated washings and maceration. The filaments composing a muscle are enveloped by cellular substance, connecting it to the adjacent parts. Each bundle is composed of numerous fibres, so minute that our instruments of research cannot arrive at the ultimate or original fibre: thus any perceivable fibre, however delicate, is formed by the juxta-position of numerous other fibres; and if we place a fibre of a muscle in the field of a microscope, that which before seemed simple, resolved itself into masses of still minuter fibrillæ. I shall not take up your time and waste my own by reciting the investigations of the various anatomists who have laboured to discover the ultimate fibre, as those researches do not assist us in explaining the phenomena of muscular action, for the cohesion of the constituent particles of the moving fibre is maintained by the vital power: hence a dead muscle will be torn by a weight of a few ounces, which in the living body would have supported many pounds. The muscular fibre receives a copious supply of arteries, veins, and nerves. Muscles have appendages called tendons, which are formed by an assemblage of longitudinal parallel fibres. They are extremely dense and tough, of a splendid whitish blue colour, which is beautifully contrasted with the florid red of a healthy muscle. The muscular fibres terminate in these bodies, and are connected to the bones. They possess no apparent nerves, and very few small blood-vessels.

Each muscle has what is termed an antagonist; for example—an extensor muscle, whose office it is to extend the part into which it is inserted, has a flexor, whose office it is to bend the part, for its antagonist: by this means the various motions of the body are produced. The muscular system affords us numerous examples of what may be called mechanical structure, *i.e.* of such contrivances employed to attain certain objects, as a human artist would adopt on similar occasions. One of the muscles of the eyeball presents us with a very perfect pulley; by means of which the globe of the eye is moved in a direction exactly contrary to the original application of the force. This muscle, which I shall demonstrate to you when on the muscles of the eye, is the obliquus superior oculi.

In some parts of the body where the tendons of one muscle pass over those of another, is a beautiful apparatus containing synovia, similar to a bag: these are called Bursa Mucosa: by this means, the dreadful effects of friction are prevented. Muscles in general are pairs, (but with one or two exceptions, we find them single, as the *orbicularis oris, &c.*) their number are so great, and the circumstances demanding attention are so numerous, that myself and colleague will demonstrate them to you on the recent subject in a subsequent part of the course. I shall, therefore, merely observe that the whole number are estimated at 289; but as they are the same on both sides, this must be doubled, which makes 578, an enumeration which is pretty nearly correct.

The vascular system consists of the heart, arteries, and veins. The heart is seated in the cavity of the thorax, somewhat inclined to the right

[1] The muscles of animals chiefly consist of fibrin, with albumen, gelatin, extractive matter, phosphates of soda, lime, and ammonia, carbonate of lime, and sulphate of potash.

side, inclosed in a membrane, denominated the *pericardium*[j]. From the heart all those vessels called arteries arise; (properly speaking, there are but two arteries in the body, *viz.* the pulmonary artery and the aorta.) From this portion, which is called the transverse arch of the aorta, generally only three arteries take their origin, *viz.* the arteria innominata giving off the right carotid and right subclavian arteries; the left carotid and the left subclavian arising separately, but in some subjects a great variety takes place; in fact, the arteries more or less vary in their course; for example, this is seen sometimes in the distribution of the arteries proper to the organs of generation and urine. The pudic artery is sometimes attached to the lateral and inferior part of the bladder of urine. Sometimes it traverses the upper segment of the prostrate gland. Mr. Allan Burns has observed, "*that in all instances of this* lusus *which have come to his knowledge, the artery has run above that portion of the prostate gland, which projects beyond the side of the urethra.*" Thus it appears, that there is an uncertainty as to the course of this artery, consequently a patient might lose his life from hæmorrhage, after the performance of the lateral operation for the stone, and no blame whatever can be attached to the operator. Such an accident might happen, and has happened, in the hands of the most experienced surgeons of the day[k]. Although I am sorry to confess, that this operation has been performed, to my knowledge, by one individual who was ignorant of the anatomy of the parts, and death was the consequence. In this beautiful specimen, which I will send round, you will perceive a curious variation in the arteries arising from the arch of the aorta; they are five in number, *viz.* the *right subclavian, right carotid, left carotid, left vertebral,* and *left subclavian;* there is no *arteria innominata.* Again, in these specimens there are but two arteries arising from the arch, *viz.* the *innominata,* giving off the right subclavian and the two carotids, while the left subclavian arises separately. Here is another specimen where there are four, the left vertebral being the fourth. I once in my life saw a specimen where a solitary artery arose from the arch. The variations in the course of arteries, are more common than many surgeons are aware of, and who ought to be prepared to meet such, when they attempt an important operation. Without entering any further on this subject, I shall merely refer you to F. Tiedemann's splendid engravings of the arteries, where the varieties are most curious, and at the same time beautifully delineated[l]. The arteries ramify to an amazing degree of minuteness, in fact, to use the words of Hippocrates, "*the whole body is an anastomôsis of vessels, a vascular circle.*" The arteries carry the bright scarlet arterial blood to all parts of the body, where this fluid, together with the arteries, performs the trifold offices of *secretion, nutrition,* and *vivification,* or *preservation of life;* the veins return the black venous blood to the heart, where the venous system terminates; during the progress of the circulation, the blood undergoes a curious change, *viz.* its containing a great quantity of carbonic

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[j] This membrane is generally found. However, the late Dr. Baillie once dissected a subject in which this membrane was wanting; a *lusus* which would scarcely have been credited had it not come from such a high authority.—*See Dr. Baillie's Morbid Anatomy, Philos. Trans. May,* 1788.

[k] Observations on Lithotomy and on the Formation of Urinary Calculi, by J. C. Litchfield. 1826.

[l] Tabula Arterium Corporis Humani. 1822. 1824. fol.

acid gas, that passes by a peculiar route, which I shall describe presently, into the lungs, where oxygen is inspired from the atmospheric air, and the carbonic acid gas is expired: the venous blood thus changes from a state inimical to the preservation of life, to one capable of preserving it, *i. e.* it changes from a dark venous to a beautiful bright scarlet colour. Previous to my describing the circulation of the blood, I must give you a slight historical sketch of its illustrious discoverer, Dr. William Harvey [m]. The ancients supposed that the aorta and arteries contained nothing more than air, (hence these vessels derived their name, from a Greek word, signifying *I hold air*, which they received from the professors of anatomy in the Alexandrian school,) and was intended for the conveyance of that fluid to all parts of the body, while the blood, they supposed, circulated in the veins; and they had an idea, which they taught to their disciples, that it moved to and fro, like the waters of the *Euripus*, where the flux and reflux (now called the tides) were first observed. Hippocrates and Galen, &c. entertained the same opinion, and continued until the time of Michael Servetus, a physician of Geneva, who was burnt by the celebrated *reformer*, Calvin, for heresy, in the year 1553. This celebrated but unfortunate man arrived at something like a knowledge of the circulation through the lungs. The circulation of the blood, correctly speaking, was not known until the year 1620, when it was discovered by Dr. Harvey. He was struck when dissecting the heart with the formation and obvious use of the valves, and soon afterwards, by the aid of a microscope, he saw the circulation in the feet of aquatic animals: he likewise noticed, that when an artery was tied, the blood swelled out the vessels on the side of the ligature nearest the heart; and that, on compressing a *vein*, the same effect took place on the opposite side. From a series of experiments he was led to this conclusion, "*that the blood moved in a circle through the body, proceeding from the heart, and returning to it again through its appropriate vessels.*" From the formation of the heart, he clearly demonstrated the circulation of the blood through the lungs. This I call the pulmonic circulation. The theory of the circulation was not publicly announced until the year 1628, and strange as it may appear, that instead of being gratefully received, it was condemned by his brethren professing the healing art, both at home and abroad; his private practice was injured, and his person insulted. Some condemned him as impious, others asserted that it was known to Solomon, Hippocrates, Aristotle, Cæsalpinus, Servetus, Vasseus, Columbus, &c.; others asserted, that he claimed a discovery which he did not merit. But this eminent anatomist and physiologist had the pleasure to outlive these calumnies, twenty-nine years after he publicly proclaimed his theory, and to witness the establishment of his system on an imperishable basis, and the science of medicine advanced by his discovery of the most important function in the animal economy [n].

The circulation of the blood is as follows: the heart is a hollow muscle,

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[m] For a biographical history of Dr. Harvey, see Part I. of a Dictionary of Anatomy and Physiology, by H. W. Dewhurst, 1827.

[n] The best Latin edition of Dr. Harvey's works, is that edited by the Royal College of Physicians in London, in one 4to volume, illustrated with a fine engraving of the author, and plates, in the year 1766.

containing four cavities, two auricles, and two ventricles. Each auricle and ventricle communicating with one another[o]. After the blood has traversed the body for the purposes already described, the superfluous quantity is returned by the vena cava thoracica into the *cavic auricle* of the heart. (Here it is deposited by the superior and inferior *venæ cavæ*. The superior vena cava brings the blood from the superior part of the body, *i. e.* from the head, neck, arms, and chest. These unite just as they enter the cavic auricle, forming one common canal into that receptacle.) From the *cavic auricle* the blood is propelled by the muscular contraction of that cavity, into the *pulmonic ventricle*, where it is received by the pulmonary artery, and circulates through the lungs, that it may become oxydated: after it has traversed the lungs and parted with the superfluous carbon, it is conveyed back to the heart by the pulmonary veins, and deposited into the *pulmonic auricle*, from whence it is ejected into the *aortic ventricle*, (where the chief artery of the body, the *aorta*, has its origin;) and into which the blood is propelled by the contraction of the ventricle, to be circulated by the aorta and its branches to all parts of the body. This, then, is the arterial circulation: the venous I have in part explained. The veins commence where the arteries terminate, and after many unions with each other, end in two grand trunks, *the two venæ cavæ*, which I have already described. Such, gentlemen, is the brief but plain outline of the circulation of the blood.

The arteries possess three coats:—1. An internal, called the cuticular coat; it is very thin but strong, and inelastic. The internal surface of this coat is perfectly smooth, so that the blood glides along it without impediment: the external surface is a little rough and connected by cellular substance to that coat which surrounds it. 2. The middle or muscular coat is composed of a series of circular fibres, separable into numerous strata, but not much resembling muscular fibres as found in other situations[p]. The external or elastic coat is made of condensed cellular substance; it is powerfully elastic, and is resolved into a looser texture, which unites these vessels to the neighbouring parts. The arteries have their nutrient arteries, veins, absorbents, and nerves.

There are seven large venous trunks in the body, to which all the blood is returned: three of these, *viz.* the *vena cavæ superior et inferior*, the *vena coronaria cordis*, returns the blood which has circulated through the body into the *cavic auricle* of the heart; the other four are the pulmonary veins, which bring back the blood from the lungs to the pulmonic auricle. The coats of the veins are thin when compared with those of the arteries;

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o We find great variation in the form and capability of the heart, in the different orders of animals. Lobsters, oysters, &c. &c. are furnished with a simple apparatus; while the heart of the fish is much more complicated, having two cavities. Amphibious animals have four cavities, but the ventricles communicate. Some of the lower orders have only a series of vessels, in which the vital fluid is circulated like the sap of vegetables.

p The great increase of the muscular power is not only evident to the sight, but can be demonstrated by experiment. The late Mr. John Hunter bled a horse to death, and afterwards examined the state of the arteries. The *aorta* was contracted about one-twentieth of its natural area, the *iliac* to one-sixth and the radial to half.—*Treatise on the Blood, Inflammation*, &c. I do not consider this experiment to be conclusive, because in the act of death, the blood is not propelled to the smaller ramifications.

hence the blood can generally be seen through them; and when they are divided they collapse, instead of presenting a circular section, as arteries do. It is difficult to separate their coats, yet they consist of two, *viz.* 1. a smooth and highly polished internal one, which lines the canal; and a rough cellular external one, in which no muscular power resides. In the veins of the extremities, there are *valves*, at a distance of an inch, or an inch and a half apart, the office of which is to support the superincumbent weight of the blood, in its ascent to the heart. Hence the circulation proceeds through these vessels merely by the impulse of the arterial blood, and is not assisted by any action of the containing tubes.

With regard to the anatomy of the absorbent system, I will state this in a few words, although I shall have again to describe the original route the food takes when describing the function of digestion. The aliment constituting our food, when masticated, is conveyed into the stomach, and there converted into a bland, uniform, pulpy mass, called *chyme.* When this operation is completed, it passes into the intestines, where it is separated into two parts, one of which closely resembles milk, called *chyle;* the other, denominated the excrementitious matter, passes through the alimentary canal, and is ejected from the body.

The chyle thus fitted for the support of the system, is received from the inner surface of the intestines, and conveyed to the right side of the heart, by means of a tube, called the thoracic duct, where it mixes with the blood, and circulates through the lungs, in the manner I have described. In this course it becomes more perfectly animals, and is prepared for deposition by the extreme arterial branches, that have the power of changing its properties into substances, whose qualities and actions correspond with those of the part they are destined to supply.

The matter thus secreted constitutes a most essential part of our fabric. It is endowed with and regulated by the vital principle. This principle, however, does not exist in the same particles during the whole period of our existence; and, when its influence ceases, they are re-dissolved, and re-conveyed into the circulation.

For this purpose, the body is every where furnished with a system of vessels, which absorbs the fluids in which their orifices are immersed. These vessels are composed of three coats; an *internal* or *cuticular coat*, a *middle muscular coat,* and a *cellular* or *external connecting coat.* After death, they are generally empty, and, as their coats are pellucid, it is difficult to distinguish them; but, by killing an animal, which has been previously fed with *milk*, *madder*, &c. or into whose stomach a solution of *starch, indigo*, or any coloured liquor, has been injected, they are rendered visible[q].

You may easily distinguish them from nerves, by their transparency; and from the blood-vessels, by the colour of the fluids which they contain, by the irregularity of their course, by their *joint-like* structure, and by their termination in glands[r]. Their contents are conveyed from the circumference towards the centre of the system, (and terminate in the thoracic duct) which has much less capacity than the collective branches[s].

Before physiologists were aware that the solid parts of the body are

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[q] Söemmerring de Corporis Humani Fabrica, tom. v.; Cruikshank's Anatomy of the Absorbent System; and Hunter's Medical Commentaries.

[r] Söemmerring, loco citato.

[s] Goodlad on the Absorbent System, p. 3.

constantly changing, it was believed, that the absorbents, like the veins, were only reflex continuations of the arteries, and that they received their contents directly from the latter vessels[t]. But the absorption of chyle from the intestines, of pus from the cavities of abscesses, and of water from the bags of the *pleura, peritoneum, tunica vaginalis testis*, &c. is inexplicable if they do not arise from surfaces; and if they arise from *surfaces* in these parts, we may justly infer, that their origin is similar in others. This doctrine was first taught by the late Dr. William Hunter, and is now universally received.

There are two sets of these vessels in the body; *viz.* the lacteals, arising from the intestines, and the lymphatics, or lympha-ducts, which arise from the extremities and other parts of the body: these absorb the particles of any substance brought near their mouths, liniments, mercurial ointment, &c. &c.: to this system of vessels appertain a set of organs, called *absorbent glands*, through which the lymph and chyle are said to be strained, and to undergo certain changes; but the nature of these changes have not yet been ascertained, though they are found to be as essential to the absorbent system, as the ganglia are to the nervous. The termination of this system is in the thoracic duct, which enters the left subclavian vein immediately below its union with the internal jugular vein.

They are supplied with arteries, veins, nerves, and *absorbents*[u], (*vasa vasorum*) from the contiguous cellular membrane: they are uninfluenced by the will, and are not endowed with acute sensation.

Eustachius, a Roman anatomist, was properly the first discoverer of the absorbent system[v]. It appears, about the year 1563, he saw the thoracic duct, or what is now known to be the trunk of the absorbent system, in a horse: he has described it in his *Treatise de Sine Pari*, where he calls it *vena alba thoracis*, and from which it is impossible to doubt his having seen the ductus thoracicus; but not understanding it, he commences at its termination in the left subclavian vein, and traces it towards its origin, where it is no wonder that he was bewildered, since the art of injection was not then discovered, and, as will be afterwards seen, hardly any of his successors had any clear ideas on this subject until the time of Assellius.

Anatomists of that period seem to have paid but little attention to this discovery of Eustachius. He is said by some to have ascribed to this *vein* the function of nourishing the thorax. No more, therefore, of this system was heard of till the year 1622, when Assellius, an Italian anatomist, investigating the motions of the diaphragm in a living dog, in the presence of his pupils and medical friends, accidentally discovered white fibres on the mesentery; he at first took them for nerves, but observing that after a puncture they discharged a white fluid, and quickly collapsed and became invisible, he pronounced them to be a new set of vessels. Repeated experiments confirmed him in this idea. He went farther; he was not only the first who saw these vessels, knowing them to be different from *arteries* and veins; but he also discovered their peculiar office.

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[t] Boerhaave, Method. Stud. Med. ab Hallero evulgat. p. 444; et in Institut. Medic. § 246.

[u] Goodlad on the Absorbent System, p. 4.

[v] Cruikshank on the Anatomy of the Absorbing Vessels of the Human Body, chap. vi. p. 32. Dewhurst's Dictionary of Anatomy and Physiology, p. 122.

The vessels he observed on the mesentery, he called *vasa lactea*, and assigned to them the office of absorbing chyle from the intestinal tube, and carrying it into the vascular system. Previous to this discovery the vessels in animal bodies were said to be of three kinds, viz. *arteries*, *veins*, and *nerves*. Having discovered the *lacteals*, he naturally terms them the fourth kind. These vessels he not only discovered in dogs, but in a variety of other quadrupeds. You may see these vessels, by killing an animal and opening it in a few hours after it had been fed, when the lacteals will be seen filled with chyle. A few evenings ago, I had the pleasure to demonstrate in a cat these vessels, and also the thoracic duct filled with chyle. In the summer of 1824, I was in Greenland, and have repeatedly seen the lacteals filled with chyle in the *narwhale*, *Polar bear*, *morse*, and the common *Greenland seal*. These vessels appeared to me to take the same course as the mesenteric arteries; and I can only regret that I did not preserve a specimen, as I can assure you, that a more splendid exhibition of these vessels I never witnessed. It does not appear that Assellius had ever seen the human lacteals, the dissection on dead bodies not being at that time practised [w]. Baron Haller says, that about the year 1600, the republic of Padua, before that period famous for anatomists, omitted even the public dissections, from parsimony. The Germans were then engaged in war, and the English had hardly began to dissect human bodies; thence arose that fondness for Comparative Anatomy; and in this state of science, Assellius of course had no opportunity of seeing the human lacteals. His enthusiasm would have led him to have opened living men, as he had living dogs; but he very gravely informs us, *that he checked that inclination* [x].

Though Assellius had not seen the human lacteals, he wisely inferred their existence from analogy, and publicly taught this doctrine, which was far from being generally received; and the doctrine of Hippocrates and Galen, which taught the absorption of chyle from the red veins, more generally prevailed; and Assellius's vessels were considered by the greater number of anatomists as fictitious. Nor is this to be wondered at, as they placed such implicit confidence on the writings of the ancients. Even the immortal Harvey, never believed in the existence of the lacteals. For several years but little was added to the discovery by Assellius, until the year 1634, when Veslingius, according to Haller, first saw the lacteals in the human subject, and gave a figure of them, but which is not very correct. About the same time, Thomas Bartholine, a Danish anatomist, also saw these vessels; but independent of the hints he received from Veslingius, there are suspicions, that he must have previously have heard of a discovery made by Olaus Rudbeck, a Swedish anatomist, of the lymphatic vessels, who supposed them to be a fifth set of vessels, which he denominated *vasa serosa*. Bartholine however changed the name to *vasa lymphatica*, a name they have still retained: he first published an account of them, and as he was a man of more eminence than Rudbeck, the whole medical world gave him the credit of the discovery. He himself, however, seems to be content to share this discovery with Rudbeck and Jolyffe.

As Bartholine has mentioned Dr. Jolyffe, who has laid a claim to the discovery of the lymphatics, Glisson informs us, that in the year 1653, Dr. Jolyffe, who was taking his degree at Cambridge, informed him of

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[w] Bibliotheca Anatomica. [x] Cruikshank, p. 34.

these new vessels; but Jolyffe has considered the nerves as vessels, in common with the anatomists of that period, and, therefore, uses the words, *quartum genus vasorum.* At the same time, he appears to have forgot Assellius's discovery of the lacteals, or he would have said *quintum genus;* unless he imagined that his vessels and Assellius's were the same, and then Glisson, I think, would have never seriously informed us, that Dr. Jolyffe had discovered a new set of vessels, which Assellius had seen long before.

Mr. Boyle attests the same thing. "By an accident, as himself hath told me, did our distinguished anatomist, Dr. Jolyffe, first light upon these freshly detected vessels; which afterwards the ingenious Bartholinus, without being informed of them, or seeking for them, hath met with, and acquainted the world with, under the name of *vasa lymphatica.*"

The absorbents have since been found in other classes of animals; but had they never been found in any other, it could not, with any propriety, have affected our reasonings on men and quadrupeds, where we knew they actually existed, and where their function appears to be as certain as their existence.

Mr. John Hunter first discovered them in crocodiles and in geese. Mr. Hewson was the first who demonstrated these vessels in birds, turtles, and fishes (in England), at the school of Dr. Wm. Hunter, in Great Windmill-street. Dr. Monro (in Scotland) also laid claim to the discovery of them in fishes, as he saw them about the same time as Mr. Hewson, although he was not aware of it. Bartholine, however, claims prior right to the last, if we are to give him credit, having seen those vessels in the globe fish.

The lacteals were known to Hippocrates and Galen; although they knew not their uses, nor the sources from whence they took their origin, or where they terminated. I will quote a passage from Galen to illustrate this fact:—"*For on dividing the epigastrium, and along with it the peritoneum, we may clearly see arteries on the mesentery of sucking kids, full of milk.*" Assellius was aware of this, as he has mentioned it in his work on the lacteals. Galen also informs us, that Herophilus taught there were veins arising out of the intestines, which did not go to the liver, but to certain glands in the mesentery, which were the nutrient veins of these glands. From this you will perceive, that the ancients had seen parts of the absorbent system, although they did not understand them.

The *Respiratory System*, you will perceive, from what I have stated, to be necessary to the preservation of our existence. The seat of this system is in the lungs. These organs are two in number, and consist of five lobes,—three in the right side and two on the left. They are connected to the larynx by means of a cartilaginous tube, called the *trachea* or *windpipe;* they are a spongy, parenchymatous organ, composed of a number of cells, which are so extremely delicate as not to admit of so gross a fluid as the blood to pass their parieties; yet physiologists believe that the air does so, and comes actually in contact with the blood. The colour varies considerably;—a bright red in the infant, bluish and spotted in the adult. Towards the posterior part of the lungs, it is always much deeper, from the gravitation of blood in the vessels, in consquence of the position of the subject. It is lighter when the lungs are inflated with air. They are raised in inspiration, and depressed in expiration. Physiologists of all ages have puzzled themselves to explain the phenomena of respiration; but the exact truth is, like that of generation, unknown. There is a system I have not yet mentioned,—I mean the *nervous*. This consists of the brain, spinal marrow, and nerves. I will first consider the brain. It has been said that all sensations are produced through the medium of the senses and the brain, being conveyed to the sensorium by the nerves. The brain is a large, soft, pulpy mass, occupying the whole of the interior of the cranium. It gives origin to the nerves that supply the organs of sense, and, through the medium of its elongation, the spinal marrow, to all the others. It is believed to be the receptacle of sensation, and the instrument of thought; but we have no certain or accurate ideas on this subject. It is a remarkable circumstance, that the very seat of sensation should, in a great degree, be destitute of sensation; but it is now a well known fact, that the external, called the *cortical* substance, is entirely devoid of sensation, in a natural or healthy state[y]. It is only when the medullary portion is irritated or compressed, that those serious evils ensue which are so detrimental to the functions of life. Although the brain, or at least this part of the brain, is so devoid of feeling, this organ, taken collectedly, is abundantly supplied with blood; indeed, so profuse is this supply, that the blood has been supposed to circulate through the brain four times greater than in any other part of the body. For this purpose, its blood vessels are large and numerous; and it is necessary that they should be so, for if the blood flows too rapidly through the brain, or if there were not a sufficient number of vessels to contain it, the intellect becomes disordered, and the ideas are engendered in a rapid, irregular, and hurried manner. If the exit of the blood from the head be obstructed, the functions of the brain are suddenly suppressed, because it requires the free and perpetual circulation of the blood, to support and renovate its powers.

Although the nerves arise from the brain, they are, on many accounts, different from it in structure;—while the brain is soft and delicate, the nerves are firm and tough, and exquisitely sensible. They are enveloped in membranes, which imparts to them additional strength and great elasticity, and enable them to pass through the most moveable parts of the body, without being bruised, or having their functions in the slightest degree impeded. The nerves, it is true, are composed of the same material as the brain; but in their progress through the body, this material is disguised by the peculiar structure of their membranes; but, it is a curious fact, the extremities are again reduced to the same delicate, pulpy, soft texture as that of the brain.

The nerves are distributed over the body in a manner similar to the blood-vessels, and there are but few parts of the body which are not influenced by their action. Their sensibility, or rather their power of imparting sensation, depends entirely upon the perfection of their functions, and their direct continuity to the brain: for if the trunk of a nerve be divided, the sensation of the parts supplied by it will be lost: again, if the spinal marrow be divided or injured, paralysis of all the parts below

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y I have known several ounces of the cortical substance have been lost by accident or disease, without any interference with the intellect of the individual. Numerous cases illustrating this fact are detailed in the medical journals.

the injury takes place (a case illustrating this fact will be found detailed in the LANCET[z] of a few weeks back); but the mischief does not, in slight cases, extend further than the loss of feeling; the nutrition and growth of the parts continue, and the action of those parts over which the will has no control, as the muscular motion of the arteries of the limb, remains entire. Nerves are not tubular, neither do they vibrate, but are highly vascular; and vessels may be seen entering the larger or more important nerves, as the *Ramusculus comes nervi diaphragmatici*, supplying the diaphragmatic nerve, and the *Ramusculus comes nervi ischiatici*, supplying the ischiatic nerve. Sir Everard Home has discovered that nerves possess no contractile power. When nerves have been divided in amputations, they swell out into little bulbs at their extremities;—these are erroneously called *ganglia* by some authors. In cases of *Tic Doloreux* and *Neuralgia*, where the nerves have been divided, they have become united by adhesive inflammation, and again communicated sensation.

Although the nerves be thus distributed like the blood-vessels, there is a peculiarity in the sensation which they convey, that the blood vessels do not possess. If arterial blood be sent to a part, it does not signify by what branch it is sent: so that it is *arterial blood*, the purpose is effectually answered. Not so with the nerves; for each nerve has its own organ to supply,—its own peculiar function to perform. For example, the *optic nerves*, by their expansion into the retina, serve the purposes of vision; the *acoustic nerve*, for hearing; the *gustatory nerve*, for taste, &c. This peculiar organization, however, is more particularly situated in the termination of the nerve; and is not endued with any peculiarity of feeling. Thus if we wound the trunk of a nerve, we shall experience the same result: there will be an undefinable sensation of pain, and convulsions or spasms of the muscles of the part; but the particular sense or organs will not be injured. An impression received on any part, even the most remote, is propagated to the brain, by the nerves connected with it. Again, a command issued from the brain is transmitted along the nerves to the parts to be put in motion, where the command is executed, and the impression is carried back to the brain by the same agency.

There exists an appendage to the nervous system, denominated *Ganglia*, from which some important nerves arise, subservient to the functions of generation, digestion, circulation, secretion, and nutrition. Bichat classes these among the nerves of organic life, the functions of which are common to animals and plants, or, in fact, to all organized beings. With regard to the functions of the brain, I must confess, with reluctance, that we know nothing further than it contains that source from which we derive all our ideas: it is larger in man than in any animal in proportion to their size: its general weight is, according to Söemmerring, from 2 lbs. $5\frac{1}{2}$ ozs. to 3 lbs. $3\frac{1}{4}$ ozs.: I have weighed several at about 4 lbs. The brain of the late Lord Byron (without its membranes) weighed 6 lbs., and contained more medullary substance than ordinary[a]. There is no part of the animal machine more capable of exciting our admiration than the nervous system. Beautiful as is the circulation of the blood, with the distribution of its vessels,—perfect and exquisite as the whole frame is

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[z] Case of J. Harlow, Lancet, No. 209, p. 699, September 1, 1827.

[a] Medwin's Conversations, Appendix, p. 520, § 6.

put together,—there are facts connected with the nerves which would fill volumes, which is delightful to contemplate in a state of health, and terrifying in a state of disease. By means of the five senses, we are enabled to live more happy, and to enjoy the pleasures of the external world. 1. The Eyes are adapted for vision; 2. the Ears, for hearing, and the modulation of sound; 3. the Nose, for smell; 4. the Tongue, for taste; and 5. the Skin, for touch. The whole external surface of the body is covered with a strong elastic integument, called the Skin: anatomists divide this into two layers, of which the internal is termed the true skin, while the external is called the scarf-skin; a third layer can only be demonstrated in negroes, in which the colour of the animal is said to reside: this layer is called the *rete mucosum*: it also exists in Europeans, but is difficult to demonstrate. The use of the skin is to afford protection and support to the organs beneath it; also to exercise a function necessary for our comfort, *viz.* the exhalation of a gas, the exhudation of the perspirable matter, denominated in vulgar language, "*sweat*[b]," and of sebaceous secretions; while, in certain parts, as the head, axilla, pubes, &c. it permits the excrescence of the hair.

All that remains now for me to describe is the Abdominal and Pelvic Viscera. Upon opening the abdomen, we see the following viscera; *viz.* the inferior margins of the right and left lobes of the liver, the fundus of the gall bladder, the ligamentum suspensorium, the fissura umbilicalis—the omentum-hepato-gastricum, anterior surface of the stomach, the pylorus and part of the duodenum, the transverse arch of colon, the omentum gastrocolicum, which, if not very fat, we can perceive the convolutions of the small intestines, and occasionally the bladder of urine (when distended) through it.

The Contents of the ABDOMEN *are as follow:—*

ABDOMINAL VISCERA.

The Liver, consisting of three Lobes; viz.	1. The Lobulus Dextra. 2. .... Sinistra. 3. .... Spigelii.
And connected by the five following Ligaments:	1. The Ligamentum Suspensorium. 2. .... Rotundum. 3. .... Coronarium. 4. .... Laterale Dextrum. 5. .... Sinistrum.
The Gall Bladder and three Biliary Ducts:	1. The Ductus Hepaticus. 2. .... Cysticus. 3. ...... Communis Choledochus.

The Stomach: the Pylorus.

The large and small Intestines.

The Small Intestines:	1. The Duodenum. 2. ... Jejunum. 3. ... Ileum.	The Large Intestines:	1. The Cœcum. 2. ... Colon. 3. ... Rectum and Appendix Vermiformis Cæci[c].

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[b] Human sweat, according to M. Thenard, is formed of a great deal of water, free acetous acid, muriate of soda, an atom of phosphate of lime, and oxide of iron, and an inappreciable quantity of animal matter, which approaches nearer to gelatin than any other substance.

[c] This appendix is found in man and the ourang-outang, but in no other animal.

The Spleen, and Pancreas.

The two Omenta; viz. ...... { 1. The Omentum Hepato-Gastricum. 2. .... Gastro-Colicum. }

EXTRA ABDOMINAL VISCERA.

The Supra Renal Glands; the Kidneys; Aorta Abdominalis; Vena Cava Abdominalis; Receptaculum Chyli; Thoracic Duct; Great Sympathetic Nerves, Semilunar Ganglion, the Ureters, Bladder of Urine, and internal Organs of Generation. These last are called Pelvic Viscera.

Of these viscera, the first that claims our attention is the liver: this is situated at the superior part of the abdomen: the office of this viscus is to secrete the bile, a fluid intimately connected with chylification, and a healthy supply of which is absolutely necessary for the nourishment of the animal. The Bile is secreted from venous blood, collected from all the veins of the intestines and of the glands in the abdomen, and entering the liver by a large trunk, called the *vena portarum*, is minutely distributed throughout its substance. Now, all these numerous and minute branches, after an endless and undefinable communication with each other, terminate in ducts so exceedingly minute as to exclude the red globules of the blood. This, in fact, is the commencement of the formation of the bile, which is carried on, the ducts gradually enlarging by an union of branches, till it is conveyed into one trunk, called the *hepatic duct*; this duct joining the *cystic duct*, forms the *ductus communis choledochus*: by this last duct, the bile is conveyed into the *duodenum*, to assist the process of chylification. As the circulation of this immense quantity of blood is uniform and regular, so also is the secretion of the bile. But as this fluid is not always wanted in the duodenum, nature has provided a receptacle, called the *gall bladder*; to this organ the superabundant bile is conveyed by the *cystic duct*, where it remains until called for the purposes of digestion[d].

The *pancreas*, or *sweet bread*, secretes a fluid also necessary for chylification, called the pancreatic juice: it enters the duodenum by its own duct: it is very small in quantity, as Majendie, who has been making experiments on the pancreatic juice, observes, "*that the quantity passed into the duodenum, was scarcely a drop an hour; and,* (says he,) *I have waited longer than that for it.*" Yet, small as it is in quantity, that it performs a very important part in the elaboration of the chyle, appears evident from the fact, that diseases of that viscus are attended with extreme emaciation.

The Spleen, in common language, called the *milt*, the *left liver*, the *bastard liver*, and a variety of other appellations, is a soft livid mass interposed between the greater curvature of the stomach and the diaphragm. It weighs about 6 or 7 ounces, and consists of a congeries of cells filled with blood, as the arteries and veins of the organ communicate with them. It is closely

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[d] Human bile, according to M. Thenard, consists in analysis of 1,100 parts; of

Water	1000
Yellow insoluble matter .... from 2 to	10
Albumen	42
Resin	41
Soda	5.6
Phosphates of soda and lime, sulphate of soda, muriate of soda, and oxide of iron	45

connected with the great curvature of the stomach by the *Ramusculi breves*, which the ramus splenicus sends off to the stomach. It has a concave and convex surface, an anterior and a posterior extremity, and an external peritoneal covering. The use of this organ is not known, although it has perplexed physiologists from Hippocrates down to the present time, yet the problem remains unsolved. It is supposed to assist digestion, yet an animal can live without it. I have extirpated them from three cats: two survived the operation for several months, and appeared in good health: the one that died was a young kitten, and on opening the body, no appearance accounting for death could be found, all the viscera appearing healthy. I am of opinion, that the operation caused a shock to the nervous system, of a nature so severe as to produce death.

The *Gastric Juice* is separated by small glands, placed between the coats of the stomach, and from thence it is emitted into the stomach itself.

From various experiments it follows; 1. That the gastric juice reduces the aliments into a uniform *magma*, even out of the body, and in *vitro;* that it acts in the same manner on the stomach after death, which proves, that its effect is chemical, and almost independent of vitality. 2. That the gastric juice effects the solution of the aliment included in tubes of metal, and is consequently defended from any trituration. 3. That though there is no trituration in membranous stomachs, this action powerfully assists the effect of the digestive juices in animals with a muscular stomach, such as ducks, geese, pigeons, &c. The Abbé Spallanzani ascertained, that flesh included in spheres sufficiently strong to resist the muscular action, was completely digested. 4. That the gastric juice acts by its solvent power, and not as a ferment; because the ordinary and natural digestion is attended with no disengagement of air, inflation, or heat, or in a word, with any other phenomena of fermentation.

Having described the organs and fluids necessary for the process of digestion, I shall conclude this lecture with a description of that function. The food is taken into the mouth, broken down or chewed by the teeth; it is then mixed with the saliva; the morsel is then propelled by the muscles of the mouth into the *pharynx*, the constrictor muscles of which propel it into the *œsophagus*, or *gullet*; the contraction of its muscular parietes force it into the stomach, where it becomes mixed with the gastric juice; a short space elapses, when this juice acts on the food, and an homogenous mass is formed, called *chyme*, quite different from its original state. The pylorus dilates, the muscular coat of the stomach contracts, and the chyme is forced into the duodenum, where it mixes with the bile and pancreatic juice; the process of *chylification* takes place, and the nutritious portions are extracted by the lacteals, and carried into the *receptaculum chyli*, through which it passes into the thoracic duct into the left subclavian vein, to mix with the circulation of the blood. The excrementitious parts pass through the large intestines, and are finally ejected by the anus.

The other organs I omitted to mention are the small glands, which *secrete the tears*, called the lachrymal glands; the salivary glands, and the glands which secrete the *cerumen*, or *ear wax*. We are divided into two sexes by the Deity, male and female, with organs necessary for the reproduction of the species. The organs of generation in the male, are the penis, testicles, vesiculæ seminales, and prostate gland. Those of the female are divided into the

External.	*Internal.*
Mons veneris.	Hymen.
Labia pudenda, and Nymphæ.	Internal portion of the Vagina.
Clitoris, Meatus urinarius.	Uterus.
Anterior portion of the Vagina.	Fallopian tubes, and Ovaria.

Thus, gentlemen, you will perceive, that the Divine Architect has fitted us with a brain, capable of reason, organs of voice for communication with our fellow-creatures, organs for our nutrition, preservation, and reproduction. In fact, we may well exclaim with the immortal Pope, that

"*The proper study of mankind is* MAN."

I have endeavoured to lay before you a slight sketch of the parts composing the animal machine. I will now take another view of man; and let us ask ourselves this simple question,—WHAT IS MAN? both in a comparative and a general point of view. Man is a being endowed with every sensible faculty, capable of doing good and evil;—he is made by the All-wise Creator the most noble of the animal creation. Endowed with a mind capable of thought and reason; furnished with a soul, that affords him the most sublime ideas—ideas which, when issued from his fertile imagination, proves his great superiority over all other animated beings. Those very thoughts, which are constantly issuing from that mind, combined with a power granted to him alone, elevates him above every other work of the Deity, (and especially when he has the fortune of being blest with a liberal education,) makes him an ornament to the society in which he circulates, and sometimes to mankind in general. The talents and abilities he is known to possess, are of the most brilliant cast when fully developed. The body expands in bulk; the arteries become daily fuller, larger, and longer; his nerves gradually become firmer; and his functions more active. But this is a description of man in his prime of life, when he is neither troubled by disease, nor tortured by mental afflictions. Let us compare him to what he was

"When a puk ng infant, in his nurse's arms:"

a poor little helpless being, possessing neither sense nor reason to guide him—no strength to support him—no abilities to administer to his wants, but by the most piteous shrieks and cries, which, were it not that he is supported by maternal affection, would soon

"Go to that bourne from whence no traveller returns;"

whereas, if we look at the brute creation, we shall find at this period, Providence has made them the superior of man, but only in this solitary instance. The quadruped can walk and feed without help; and what is more, are even clothed by the omnipotent Deity. Now let us turn to man in his latter years, when he is about to shake off this mortal coil of infirmities and disease. When old age approaches, the arterial system acts more weakly, the irritability is less, the functions are more weak, the glands diminish in bulk, the fat is absorbed, and the fluids become more acrid. The arteries can no longer conquer the accumulated load in the veins, the brain is overloaded, and serum exhales in the abdomen and under the skin; the glandular vessels cannot propel their fluids, the nerves no longer possess their irritability, and senses decay. From these causes, the limbs grow stiff—the arteries ossify, or are partially converted into bone—the whole system is oppressed with a load it cannot overcome—in fact, the proverb becomes verified,

"Once a man and twice a child."

Naked and helpless he came into this world, and helpless he goes out of it. His memory fails, his steps falter, his voice trembles, his health decays, his eyes become dim, and, at last, his vital functions refuse to perform their office, nature fails, and he expires.

The Lectures to be delivered in this Theatre will be on Anatomy, Physiology, and Surgery, punctually at Four in the Afternoon, by myself. The reason I have chosen this hour is, that the pupils seldom leave the Hospitals until near Three o'clock, in consequence of the late appearance of the surgeons; therefore, by adopting this hour, the pupils neither lose their Lecture nor leave the Hospital before the surgeons have gone round. The Lectures on Surgery and Diseases of the Eye, will take place every Tuesday and Thursday Evenings, at Eight o'clock, by myself and Mr. Litchfield; the Lectures on Physiology, every Monday and Friday Evenings, at Six o'clock. In the Anatomical Lectures, the structure and functions of the human body will be clearly elucidated from the recent subject. The Dissecting-rooms will be open all the morning, with every convenience; and myself or colleague will attend to direct you, and point out the parts appearing on dissection. I have made arrangements for an excellent supply of Subjects. The Demonstrations will take place daily by myself or colleague, and each of you will be required to demonstrate in your turn; and will perform the surgical operations yourselves on the dead body.

With respect to the works proper for you to study in Anatomy, I recommend Monro's Osteology, by Dr. Kirby; Innes on the Muscles; Bransby Cooper on the Ligaments; Barclay on the Arteries; and also that portion of my Dictionary of Anatomy, containing the article Angiology; Bell on the Nerves; Bell's Anatomy of the Human Body. These are fit for the closet; but in the Dissecting-Room, any of the Manuals will be of service to you: the best are those by Mr. Green, Mr. Mayo, and the late Mr. Shaw. On Surgery, you will do well to consult Mr. Cooper's Dictionary of Surgery; Sir Astley Cooper's Treatise on Dislocations; and Mr. Lawrence on Hernia. On Physiology, I refer you to Bostock's Elements of Physiology; Herbert Mayo's Outlines; and Richerand, by Dr. Copland. This last is the best, as the Notes and Appendix, by Dr. Copland, are highly valuable, both to the practical Anatomist and Physiologist.

I have now, Gentlemen, only to add in conclusion, that myself and Mr. Litchfield will endeavour to facilitate your progress in your studies, and if you are not good practical Anatomists, it shall not be our faults, for every exertion on our part shall tend to make you such; and I wish you to recollect, that *a good Anatomist seldom fails of becoming a good Surgeon.*

THE END.

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