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Dr Wells

THE

MORBID ANATOMY

OF

SOME OF THE MOST IMPORTANT PARTS OF THE

HUMAN BODY.

BOSTON MEDICAL LIBRARY ASSOCIATION.

BY MATTHEW BAILLIE, M. D.

TO WHICH ARE PREFIXED,

PRELIMINARY OBSERVATIONS

ON

DISEASED STRUCTURES.

BY JAMES WARDROP,

SURGEON TO THE KING,

&c. &c. &c.

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PRELIMINARY OBSERVATIONS

ON

DISEASED STRUCTURES.

As an introduction to the detailed description which Dr. Baillie has given of the various diseased changes to which the different organs of the human body are liable, I have thought that some general account of

Diseased Structures,

and particularly of those which have lately attracted a good deal of notice, might be considered useful; more especially as this branch of medical science has been cultivated with great zeal both in this country and on the Continent of Europe, since the publication of Dr. Baillie's work.

On taking a general view of the diseased changes of the various organs and textures composing the human body, striking differences may be remarked in the character of these changes, and in the combination of the phenomena which accompany them. Some diseases change the structure of only one organ, or one or more

textures of an organ, whilst others attack various organs, or several different textures, at the same time. Some diseased changes influence the function only of one organ, others contaminate more or less the whole system. Some diseases go through a particular course, and leave the body uninjured; whilst others proceed, without interruption, until they destroy life. In some diseases a new growth is formed; in others there is a destruction of the natural structure of the diseased organ. In some the new growth resembles one of the natural structures or textures of the body; in some it is a substance *sui generis;* and in others it is a combination of both these classes of diseased structures. The various subdivisions of diseased structures which may thus be formed must be considered as artificial. Such views are nevertheless of great importance; for by tracing the analogies that exist between diseases as they occur in different parts of the body, not only is the study of Pathological Anatomy much facilitated and abbreviated, but we are greatly assisted in acquiring an accurate knowledge of diseases, of perceiving differences in their general character, and of establishing general principles for their treatment.

I ought to observe, before proceeding further, that what has now been said, is meant to apply only to Diseased Structures, the department of medical science on which alone Dr. Baillie has professed to treat. For it may be remarked, that there are many other phenomena attending particular diseases, not strictly coming within the province of pathological anatomy, which would enable us still further to view diseases, and class them together by an artificial arrangement. Some diseases, for example, can be propagated by inoculation,

others by contagion; some affect an individual only once during his life; some are idiopathic, others are symptomatic; some are hereditary, and others are epidemic. There are still other subdivisions of diseases, which have been formed from changes in the qualities, or an increase or diminution of the quantities of the fluid secreted by different organs: in some of these diseases, fluids are formed which have no resemblance to any of the natural secretions; in others, concretions or depositions from the fluids take place; and in other diseases, living animals are produced. But all these different classes do not come within the province of the present observations.

Of particular Diseased Structures.

Notwithstanding the multiplicity of appearances exhibited in the diseased structures in various organs, pathologists have conceived that they can be reduced to a certain number of species, each possessing a peculiar character by which it may be distinguished, in whatever part of the body it is met with. These species have been arranged into two classes, one comprehending all those morbid appearances which are the effect of simple inflammation, whilst the other class includes those which are the result of specific diseased processes, the general characters of which it is here intended more particularly to describe; these are, the Scrofulous Structure, the Scirrhous Structure, the Hæmatoid Structure, the Melanoid Structure, and the Compound Diseased Structures. All these have little or no resemblance to any of the natural structures;

but there is also a number of diseased masses, whose general appearance, and chemical qualities, have a great analogy to the healthy parts of which the body is composed. Cellular membrane and fat are formed in the steatomatous tumor; serous cavities exist in encysted tumors; mucous membrane is formed in fistulæ; synovial capsules in artificial joints; horny substances, composed of a matter resembling the nails, grow on the skin; arteries, veins, and absorbents are generated in newly-organised parts; bone and cartilage are formed in different tumors: and even complete organs are sometimes produced by a diseased process, such as the hair and teeth met with in encysted tumors altogether unconnected with the uterus.

There is also a power in the human body, and which is still more wonderfully developed in the lower animals, of certain of its parts being regenerated. If a bone be fractured, the broken extremities are re-united by osseous matter; and the epidermis, the nails, the hair, the arterial, the venous, the absorbent, and the nervous systems, are each capable of regeneration. This power is, however, limited to certain parts, and ought to be distinguished from the changes produced by disease.

With regard to those diseases, wherein there is an increase in the quantity, or a change in the quality of the natural secretions, almost every secreting organ furnishes examples. Corryza, epiphora, ptyalism, diabetes, and the various dropsies, afford illustrations of such diseases. There are also other fluids formed in diseases which have no resemblance to any of the natural secretions, such as the various kinds of pus which are met with in diseased organs.

Of Specific Diseases.

Those diseases are termed Specific* which attack several organs, or several textures of an organ indiscriminately, and which are, at the same time, attended by a particular train of constitutional symptoms, and always pursue a particular progress. Scirrhus, Fungus Hæmatodes, Fungus Melanodes, Scrofula, Gout, Scurvy, &c., are examples of specific diseases; and others, as Small-Pox, Measles, Scarlatina, and Syphilis, have also been denominated specific, from the peculiarities of their exciting causes. Diseases arising from morbid poisons are also called Specific; hence Hydrophobia, and the various animal, vegetable, and mineral poisons, each produces specific effects on the human body. There is also a variety of diseased changes arising from the absorption of matter in dissecting dead bodies, either by the skin or by wounds, that they may properly be considered as specific; and some specific diseases are also communicated by contagion, and others by inoculation.

In some Specific Diseases there is a morbid growth, whereas in others there is a destruction of parts. The

* It has been the opinion of some Pathologists, that every diseased structure is the consequence or the effect of inflammation; and as the character of inflammation varies, so do the appearances of the diseased structure. John Hunter, that ingenious and acute observer, was thus led to divide inflammation into two distinct kinds; the one he denominated *common*, and the other *specific* inflammation. Adhesions, suppuration, ulceration, &c., he considered as the diseased changes produced by common inflammation, whilst another class of diseased structures are the effects of *specific* inflammations.

diseased structures which are generated in specific diseases, differ, in many respects, in their general characters, from the common diseased structures. They want the uniformity of appearance which common diseased structures present, and have a variety in consistence and colour, at different stages of their progress. Some of these morbid structures are interspersed in the substance of the affected organ, whilst in others the natural structure completely disappears, and is replaced by the new growth.

Though Specific diseases may be said to affect various organs and various textures of the body, yet each of them seems to have a preference or disposition to attack some particular organs and textures more than others. Scrofula most frequently attacks the lymphatic glands; scirrhus the conglomerate glands; syphilis the skin, the lymphatic glands, the amygdalæ, and the bones; and there is reason to suspect that fungus hæmatodes, in some instances at least, affects the nerves: the medullary pulp of nerves I have also, in some instances, observed to have been altered in the melanoid tumor.

It may likewise be remarked of Specific diseases, that they vary but little in their characters in different organs, any varieties which they exhibit arising chiefly from differences in the constitutions of the individuals affected by them, and different stages of their progress.

Another character of Specific diseases is, that some of them run through a particular course, and, though symptoms may be alleviated, yet the progress of the disease cannot be checked.

Another striking peculiarity of Specific diseases is their primary and secondary stages, the accession of

the secondary symptoms indicating a remarkable period in the history of these diseases, and producing an important change in their character and treatment.

When Specific diseases advance to the second stage, the secondary affection consists, either in lymphatic glands, in the direct channel of the absorbents, becoming diseased, or by distant organs becoming affected, by some mode of constitutional contamination not hitherto explained; or the disease may spread by both these modes in the same individual, and at the same time. Thus, the secondary symptoms of syphilis are sometimes the appearance of bubo, sometimes an affection of the skin, and sometimes an ulceration of the tonsils. Scirrhus, in its progress to the second stage, more generally affects those lymphatic glands which are in the direct course of the circulation; but, in some cases, scirrhous tubercles form in remote internal organs, as in the liver and lungs. The same observation may be made with regard to fungus hæmatodes, and fungus melanodes; the adjacent lymphatic glands being sometimes contaminated when these diseases advance to their second stage; whilst, in many instances, distant organs, and organs not in the direct channel of the absorbents, become the seat of hæmatoid or of melanoid tubercles.

The progress of both these classes of symptoms varies exceedingly in different examples of Specific diseases. In some, the primary symptoms spread very slowly, in others rapidly. In some, the secondary symptoms make their appearance soon after the primary affection has commenced. In some instances the secondary symptoms appear very late; and in others

the primary disease even proves fatal before the accession of any secondary symptom.

The line of demarcation between the primary and secondary stages of specific diseases leads to some important practical conclusions; because it accurately points out those cases where local treatment can be expected to avail, and those where relief can only be obtained through the medium of the constitution. In syphilis this division of symptoms has long been pointed out, and the treatment regulated accordingly; and, in my Essay on Fungus Hæmatodes *, I have had occasion to dwell at some length on the impropriety of attempting to remove either hæmatoid or scirrhous tumors, when any secondary affection can be detected.

It may be remarked of all specific diseases, except those which are conveyed into the system by inoculation, that they generally attack an organ which has previously been diseased. A scrofulous gland will usually be found to have first been affected with common inflammation. Or, if a person of a scrofulous diathesis receive an injury, the injured part, though first affected with common inflammation, may ultimately participate in the peculiarity of the constitution of the individual. And thus the effects of local injury can often be traced with respect to scirrhus; the mamma, the testes, and the skin, being in many instances injured or otherwise diseased, previous to tumors in these organs assuming the scirrhous character. How often do tumors of the mamma, that have for a series of years remained stationary and indolent, become suddenly malignant, after having

* Observations on Fungus Hæmatodes, 1807.

been accidentally injured, or when the uterine system, with which the mamma so greatly sympathises, is deranged?

The same observation may often be made in cancerous affections of the skin; for these very frequently commence by a common wart, which, having remained quiet for years, is at last accidentally scratched or injured, after which it assumes all the malignant character of cancer.

It is also the same with respect to Fungus Hæmatodes, for in a great number of cases which have come within my observation, the affected part had received some injury previous to the appearance of the malignant tumor.

Specific Diseases affecting an organ, or a particular texture of an organ which had previously been diseased, affords an incontrovertible argument in favour of the opinion that such diseases are, at one period, purely local. In the history of Syphilis this fact is distinctly proved, and I think it must also be admitted that Cancer may sometimes exist without any constitutional contamination. Reasoning, therefore, from analogy, may it not be inferred that both Fungus Hæmatodes and Fungus Melanodes are also at one period, strictly speaking, local complaints?

The Scrofulous Structure.

When Scrofula affects a glandular part, it is found on dissection that the first change is a simple enlargement of the gland, the glandular structure becoming rather softer, and acquiring a redder colour than na-

tural. Suppuration afterwards commences at a particular point, or at several points at the same time, and usually towards the middle of the gland, and the suppurative process involves, more or less quickly, a larger or smaller portion of the gland.

It often happens that a scrofulous gland swells, and remains so for many months, and even years, without becoming red or tender; and suppuration takes place without any signs of inflammation, except only to such a degree in the surrounding cellular membrane and skin, as shall be sufficient to form a perforation in the integuments for the evacuation of the matter.

The suppuration of a scrofulous gland is characterised by the formation of a yellowish white, or pale greenish-coloured matter, the extent or limits of which are distinctly defined, imbedded in the substance of glandular structure. This matter has at first a firm, curdy, consistence, and, as the process advances, some portions become more fluid; until, ultimately, the suppurated cavity contains a matter partly curdy, partly puriform, and partly serous. When this matter is removed by ulcerating the parieties of the cavity containing it, an irregular-shaped sac remains in the substance of the gland. Whilst the swelling of the part diminishes, the sides of this cavity become covered with a curdy, yellow incrustation, more or less firm; and, from its surface, a puriform matter is afterwards secreted. This incrustation prevents the formation of granulations, and is the cause of scrofulous cavities not healing up; whilst it is by the separation of this crust, in consequence of laying open these abscesses, that granulations form and heal up the cavity.

The incrustation covering the internal surface of the

scrofulous abscess, when of very long standing, acquires a surface, which resembles a Mucous membrane, from which the puriform fluid is secreted.

Cavities of this description are met with in all organs affected with scrofula; and this appearance may be considered as one of the most striking pathognomonic characters of that disease. It has not only been accurately described, but beautifully delineated, by Dr. Baillie, in the lungs, liver, thyroid gland, testicle, kidneys, &c.

When scrofula affects the lungs, liver, or any of the secreting glands, it appears in the form of a *tubercle.*

The structure of the Scrofulous Tubercle in most respects resembles that of a scrofulous lymphatic gland, such changes taking place only as may be supposed to arise from the difference in the natural structure of the parts affected, and which are all distinctly described by Dr. Baillie, in treating of the diseases of the different organs. Some French nosologists have used the term tubercle as synonymous with scrofula, whereas, in this country, it has been commonly employed as a generic term, comprehending several distinct species, such as the scrofulous, the scirrhous, the hæmatoid, and the melanoid tubercle.

When the scrofulous tubercle of the lungs suppurates, the cavity containing the matter presents appearances analogous to those already mentioned; and Lænnec has made the important observation, that the incrustation lining the cavity of the tubercle, in some instances, becomes very firm, and assumes the character of a cartilaginous sac, lined by a mucous membrane and forming a fistula properly so called; or, the sides of the sac coalesce, and completely obliterate the

cavity; thus constituting two natural modes by which a tubercle may be cured.*

In these respects, scrofula is very different from fungus hæmatodes or scirrhus; for, when the central parts of such tumors are disorganised and burst, in place of purulent matter, they discharge blood or an ichorous sanies, and fungi grow from the ulcerated openings, while the diseased masses, at the same time, increase in size. In syphilis, there is more or less destruction of the parts which are affected.

There is little doubt of the *hereditary* nature of scrofula; and it may in general be remarked, that whatever organ or system parents have diseased, their offspring are more liable to such affections than to any other. One disease sometimes appears to excite another; and hence small-pox, measles, and syphilis, are often the immediate cause or precursors of scrofulous affections.

Scrofula is most common in youth, though it appears at all periods of life; and often exists in many different organs in the same individual.

Some chemical changes take place in scrofulous subjects. The urine contains less phosphoric acid; whilst the proportion of the calcareous phosphate is increased. Calcareous phosphate is also found, after death, in the lymphatic glands, in the thoracic duct, and in the substance of the viscera of scrofulous subjects.†

Scrofula is certainly not contagious; healthy wounds

* See Traité du Diagnostic des Maladies de Poumons, &c. &c., par Lænnec. Paris, 1819.

† See Pinel's Nosographie Philosophique.

have been inoculated with scrofulous matter; but their character has never been changed. It has also been said, that scrofulous nurses communicate this disease to infants; but that fact has not been ascertained.

Of the Scirrhous Structure.

The terms Scirrhus and Cancer have generally been used to express two stages of the same morbid affection; the first signifying the occult, and the second the ulcerated state of the disease.

When a scirrhous tumor, removed from any part of the body, is examined, the structure of the affected organ will be found completely changed. It is converted into a firm, hard, rugged, unequal, and incompressible mass, not contained in any distinct capsule, or having its limits accurately defined. It is of a light grey colour; and, if cut in thin slices, is semi-transparent.

It may be observed to consist of two distinct and very different substances; the one hard and fibrous, the other more soft, and apparently inorganic. The *fibrous* substance composes the chief part of the scirrhous mass, and consists of septa, which are opaque, and of a paler colour than the soft part. These septa, or bands, are very unequal in their length, breadth, and thickness, and are disposed in various directions, so as sometimes to form an almost solid mass; and in other instances, a number of cells, or irregular cavities, containing the soft part.

The *soft*, or inorganic part, is sometimes semi-transparent, of a bluish colour, and resembles, in con-

sistence, softened glue or horn. In other cases it is more opaque, softer, somewhat oleaginous, and like cream in colour and consistence.

The proportion and the mode of the distribution of these two substances are very different in scirrhous tumors, of the same as well as of different organs, and give that great variety of appearance, which may be observed on examining a number of tumors of this kind in different textures.* In some scirrhous tumors the fibrous part is most conspicuous, and is condensed into a very solid mass, having the appearance of a nucleus, from which septa come off in various directions, and giving a section of the tumor a radiated appearance. This is, perhaps, the most usual appearance of the disease. In some, the tumor is very irregularly shaped, and is nearly a uniform hard mass, in which scarcely any defined structure can be traced. In some, the fibrous part has a cellular appearance, the cells being filled with a soft pultaceous matter, which can readily be pressed out. In others, cysts are formed in the tumor, of various dimensions, which generally contain a bloody, or chocolate-coloured fluid. These cavities are lined by a smooth membrane, and they have sometimes fungous tumors growing from their surface. It occasionally happens, too, that parts of scirrhous tumors have a great degree of hardness, being converted into a substance resembling cartilage, in which bony or calcareous depositions are sometimes found.

* These differences in the appearance of scirrhous tumors led Mr. Abernethy to divide them into different species, designating them by the names of Mammary, Pancreatic, Tuberculous, &c., from a supposed resemblance to these natural structures.

When scirrhous tumors are formed in the substance of a gland, their limits cannot in general be accurately determined, the two structures apparently being inseparably connected. In some instances a scirrhous tumor condenses the cellular membrane which is in its immediate vicinity, and acquires a somewhat sacculated appearance.

Scirrhous tumors pass from the state now described to that of suppuration and ulceration. The soft substance is transformed into a thin ichorous matter having no resemblance to pus; and the disorganisation generally begins at the centre of the morbid mass, and extends towards that part of it which is nearest the surface of the body, or some of the natural openings. It is in this ulcerated stage of a scirrhous tumor that the disease is denominated Cancer. When ulceration has taken place, the tumor does not generally increase in bulk, but is destroyed by a process of ulceration; and as the disease extends, and the ulcerative process goes on, new parts become involved, either through the direct channel of absorption, or by some mode of constitutional contamination, and the disease ultimately proves fatal by the extent of parts which it destroys, and the universal irritation which such a process creates throughout the system.

It sometimes happens, when the skin covering a schirrous tumor has ulcerated, that a fungus arises from the surface of the diseased mass, of a cauliflower appearance, and of a very hard, gristly texture; and if the disease advances, the fungus and the original tumor are finally destroyed, but this is by no means the progress in all cases.

It has been observed that some cancerous sores, from

having been of a painful and malignant character, suddenly appeared to assume a more healthy aspect at one particular part, and have begun to cicatrize.* This apparent amendment, however, is merely a delusion, for, sooner or later, the ulcerative process is renewed, and goes on without interruption.

There are few examples of scirrhous tumors which do not ultimately contaminate the lymphatic glands; but I have seen these glands primarily affected only in two instances. The contamination of the lymphatic glands takes place at very different periods of the disease; and those glands are first affected which are in the course of the circulation.

There are also other organs which are secondarily affected with scirrhus; but whether the disease spreads to them by the absorption of the specific virus, or by some other channel, is not ascertained.

Scirrhus is nearly altogether confined to those advanced in life: there may be a few exceptions, but they are extremely rare, in which scirrhus has been met with in persons below the age of thirty. I once saw a remarkable example of cancer in the skin of the abdomen of a girl, about twelve years of age; but if there be any period of life when the body is more subject to cancer than another, it is in the female at the cessation of the catamenia.

Scirrhus, in its primary form, affects various organs, but seldom those necessary for the preservation of life. It most commonly attacks glands, whose functions have been interrupted, or those glands which have never performed the offices intended for them, or

* See Sir Everard Home's Observations on Cancer, 1805.

it affects parts that have previously been diseased, or that have at some period received an injury.

The organs most frequently affected with scirrhus, primarily, are the mammæ, the uterus, the ovaria, the testicles, and the thyroid gland. It also affects the skin, the mucous membrane lining the nose, the mouth, and the pharynx, the œsophagus, the stomach, the intestinal canal, and the bladder.

The viscera which are secondarily affected with scirrhus are commonly the lungs, the liver, the omentum, the mesentery, the spleen, the pancreas, the brain the medulla of the bones; and tubercular masses of a scirrhous structure are also met with in the skin. It may here be observed, that scirrhus affects the skin in two forms; the first, in that of wart, and the other in that of tubercle, the first being a primary, and the other a secondary affection.

Scirrhus, like scrofula, has also been considered by some as a hereditary disease; and there are many examples of several individuals in one family having had cancerous affections.

*Structure of Fungus Hæmatodes.**

When Fungus Hæmatodes appears in the form of a tumor covered by the integuments, and has not yet

* It may be proper to take notice of the confusion that has arisen amongst some French writers, in the acceptation of the term Fungus Hæmatodes, first adopted by Mr. Hey, they having, in some instances, applied it to the nœvus maternus, and in others to the anastomosing aneurism — the disease, which English surgeons have denominated Fungus Hæmatodes, the French have described under the name of "Tumeur Encephaloide."

acquired a considerable bulk, it is remarkable for the equality and smoothness of its surface; its want of discolouration; its softness and elasticity; and for communicating to the touch a more or less obscure sense of fluctuation. When removed from the body, the form of the hæmatoid tumor is determined, and accurately circumscribed, being more or less globular, and having generally a distinct covering, or capsule, of cellular membrane, more or less condensed.

This morbid growth, when divided, soils the knife, and appears to be chiefly composed of an opaque, whitish or greyish homogeneous substance, which has generally been compared, both in colour and consistence, to the cerebral pulp.* Like brain, also, this substance softens when exposed for a short time to the atmosphere; and, when the softer parts of the tumor are washed away, or when the mass is compressed, a loose filamentous texture, resembling cellular membrane, remains.

The consistence of the hæmatoid tumor varies, to a certain extent, in different stages, and also in different parts of the same mass, being in some not much firmer than custard, in others harder than the most solid parts of healthy brain.

The colour of the tumor is subject to considerable variety. Commonly, it has exactly the colour, as well

* Mr. Abernethy, in his classification of tumors, has used the term Sarcoma to denote a genus of tumors, of which he considers the medullary as a species; but it is inconsistent to speak of a tumor being a *medullary* species of a *sarcomatous*, or fleshy genus. If, indeed, the word Tumor be taken to denominate a class, there is necessarily brought together a vast number of diseases which have no analogy to one another, except that of swelling.

as the consistence of brain; sometimes a portion of it is redder, and has more of a fleshy appearance; and sometimes another portion of the same tumor resembles a clot of blood. When the disease takes place in the brain, so much does it resemble coagulated blood, that it may easily be mistaken for it, and its nature not precisely ascertained, until by washing it the pulpy and colouring matter is removed, and the loose filamentous and cellular texture remains.

The medullary structure, though certainly the usual is not the only one to be met with in this species of tumor. In many examples the diseased mass is composed of a variety of different portions, some of which are distinctly insulated by cellular capsules, and each portion differing in size, colour, and consistence. Some of these portions are met with of a firm solid structure; some are cartilaginous, or like softened glue; and others have ossific or earthy particles intermingled with the pulpy matter. In the substance of many hæmatoid tumors, there are insulated portions, much resembling boiled yolk of egg, both in consistence and colour. I have found this peculiar substance in most of those organs, wherein fungus hæmatodes has been detected; which circumstance might lead us to consider it as one of the general characters of the disease.

In some cases of fungus hæmatodes, nerves have been found diseased, and connected with the diseased mass; but they have never been observed to be changed in structure, except in the primary tumor.

In the eye, the optic nerve is changed in its structure, in almost every example of the disease; and in

one very remarkable case, of a large hæmatoid tumor of the thigh, I traced the anterior crural nerve passing into the centre of the diseased mass, and so completely lost in it, that it was impossible to distinguish the two structures, so much did they resemble one another in colour and consistence.*

As the tumor advances in growth, some portions become disorganised; and this process of disorganisation usually commences in the central portion of the mass, where it becomes less firm. Cavities also form in it, which chiefly contain blood, and when the blood is washed away, and the tumor suspended in a fluid, numerous membranous filaments, or shreds, are seen floating in the cavity. Finally, the integuments covering the tumor become discoloured, adhere to the subjacent parts, and then ulcerate; or, if the tumor be either in the peritoneal or the thoracic cavity, then the peritoneum or pleura gives way.

But, in place of the morbid growth being afterwards destroyed by an ulcerative process, a *fungus* shoots forth, and the tumor seems to increase more rapidly. The fungus, instead of having the hard and firm texture of a cancerous fungus, is soft, easily torn, and bleeds profusely when even slightly injured. It is usually of a dark red or purple colour, and of an irregular shape. When small, it has much the appearance of the softer kinds of polypi which grow from mucous surfaces.

This fungus is remarkably rapid in its growth, and

* Is not the fact of fungus hæmatodes affecting both eyes a proof of the connection of the two optic nerves — and does it not also afford proof of these nerves being the seat of the disease?

often acquires a prodigious bulk. From its surface there exudes a thin fœtid sanies, and often blood is discharged in great quantities. Hence the name, Fungus Hæmatodes. In proportion as a fungus grows large, it becomes softer, and portions of the most prominent parts lose their vitality, and separate in sloughs, yielding a most offensive fœtor.

Fungus hæmatodes is usually met with in early life; in this respect it differs from scirrhus, which is to be considered as a disease of old age.

Fungus hæmatodes, like other specific diseases, attacks only particular organs in its primary form. Since my observations on this disease * were published, my attention has been further directed to the investigation of the subject, and I have detected it in several organs not before described. I formerly stated that hæmatoid tumors had been described by Burns in the extremities, and by Hey both in the extremities and in the mammæ; that the pulpy testicle, described by Dr. Baillie, belonged properly to this species of disease; and I also demonstrated, by a series of dissections, that the eye, the uterus, the ovaria, the liver, the pancreas, the spleen, and the lungs, were all subject to this affection. I have since met with hæmatoid tumors in the urinary bladder and alimentary canal, in the brain, in the bones, in the mesentery, in the omentum, and in the thyroid gland.

Whilst all the changes above described are going on in the primary tumor, either some of the absorbent glands become sooner or later contaminated, or tubercles form in some distant organ or organs, thus

* See Observations on Fungus Hæmatodes, 1809.

constituting the second period, or the *secondary* symptoms of Fungus Hæmatodes.

Whenever specific diseases advance to their second stage, the whole constitution becomes disturbed, feverish symptoms come on, and a general wasting of the body ensues. But the rapidity of these symptoms varies exceedingly in different cases of fungus hæmatodes, and in some they appear extremely mild, even where enormous masses of disease are found, after death, in the internal cavities.

When the absorbent system becomes contaminated usually one or more glands swell in the vicinity of the primary tumor, and this takes place in some instances at a very early period of the disease, whilst in others not until the primary tumor is far advanced. In some cases the diseased glands grow to an enormous size, whilst in others they are but slightly enlarged. In some cases the primary affection makes little progress, whilst the disease of the glands advances rapidly, and seems to be the immediate cause of death. I have always found the glands converted into a substance resembling the primary tumor; and the medullary looking matter is not met with in a particular portion of the gland, but the whole gland appears to be converted into it, exhibiting a homogeneous pulpy mass contained in one firm cellular capsule. In all cases, the primary tumor is intersected by cellular strata, dividing the diseased mass into lobes, and the structure of each lobe more or less varies in its appearance; but, in all the contaminated absorbent glands which I have dissected, they have appeared throughout of one uniform structure. In some cases, the skin covering the gland ulcerates before death, and forms a foul sloughy ulcer,

but I have not observed, in any case, a fungus arise from a diseased gland.

The formation of tubercles in one or more distant organs is the other mode by which Fungus Hæmatodes advances to the second stage, or to constitutional contamination. In many instances both classes of symptoms take place at the same time. I have found them most frequently in the lungs and liver*; and also in the cavities of the heart, in the brain and its membranes, in the spleen, kidneys, and pancreas, omentum, and mesentery.

Those organs, in which tubercles have been observed, constituting the secondary symptoms of Fungus Hæmatodes, I have never found primarily affected. This is analogous to what is noticed in other specific diseases. Hence syphilis never affects those organs primarily which are the seat of its secondary symptoms.

Hæmatoid tubercles are seldom confined to one organ of the body; and in many instances even all the organs already enumerated have been contaminated in the same individual.

The appearances and structure of the tubercles are generally the same in whatever organ they are met with. They are found both near the surface of the affected organs and also embedded in their substance. Their limits are readily distinguished from the adjacent sound structure, though they do not appear to have distinct capsules, for they seem inseparably connected with the healthy parts by an intimate intertexture of the sound and diseased structures. They vary in

* Mr. Langstaff, in the ninth volume of the Medical and Chirurgical Transactions, mentions a case of Fungus Hæmatodes in the liver, where no other organ was affected.

size from that of a pea to that of a walnut. They are usually of a pale grey or cineritious colour, and when divided present an uniform structure which is sometimes pulpy, but more frequently firmer than either the primary tumor or healthy brain.

A hæmatoid tubercle never presents the variety of structure which is observed in some primary tumors of the same species.

In all cases of primary tumor the mass is intersected by cellular striæ, and the structure of each lobe more or less varies; but in all the diseased absorbent glands as well as tubercles which I have dissected, they have appeared throughout of one uniform structure.

Hæmatoid tubercles formed near the surface of an organ sometimes throw out fungi, and those situated in the interior of an organ sometimes, though rarely, have cavities formed within them, in which fungous tumors grow.

Structure of Fungus Melanodes.

Until my treatise on fungus hæmatodes was published, though that disease had been observed in a few parts of the body, yet no general description of it had been given: its precise character had not been described, nor had its existence been observed in several of those organs in which I discovered it. Some of the pathognomonic symptoms of that formidable disease were pointed out, as well as the difference in its structure and history, both from scirrhus and scrofula. I also stated, that some of the particular cases described in that work, which seemed neither examples of scirrhus

nor scrofula, appeared to resemble fungus hæmatodes more than any other diseased structure, and were, therefore, arranged under that denomination, until their nature was farther investigated.

The difference in the structure of some of these tumors was particularly remarkable in a case of diseased eye *, where the mass within the globe, the medullary portion of the optic nerve, and the diseased lymphatic glands, were all completely converted into a substance of a dark brown, nearly black colour. Tumors of a similar dark brown colour were also observed in the liver and lungs; but as in all other respects more particularly the formation of a fungus, the pulpy texture, the primary and secondary form of the disease, the case resembled fungus hæmatodes, it seemed most probable, that the dark-coloured tumors were only a variety of the hæmatoid disease.

A series of similar cases, and the observations of some eminent pathologists in France, more particularly Bayle †, Lænnec ‡, Dupuytren §, and Breschet ‖, have now satisfactorily pointed out, that the cases then alluded to might, with propriety, be considered as a

* See Observ. on Fungus Hæmatodes, page 17., also Case xvi. Mr. Burns, in alluding to this case, mentions that Haller had twice observed tumors of a similar black colour.

† Bayle sur la Phthisie Pulmonaire, 180.

‡ Note sur l'Anatomie Pathologique par Lænnec, Journal de Médecine, tom. ix. Extrait du Mémoire de M. Lænnec sur les Melanoses, Bulletin de la Faculté de Médecine, 1806.

§ Observations sur la Note aux Altérations Organiques, publié par Lænnec, Journal de Médecine, tom. ix.

‖ Considérations sur une Altération Organique, appellée Dégénérescence Noire, — Melanose, — Cancer Mélané, &c. &c., par G. Breschet. Paris, 1821.

distinct species of tumor; to which they have given the name Melanodes, in order to distinguish it from the *white* tumor of their nosology. * But, to preserve a uniformity in the use of terms adopted in this country, I shall designate this disease by the name of Fungus Melanodes, to show that whilst it is a different species, yet it is of the same genus as the fungus hæmatodes; for, like scirrhus, scrofula, and fungus hæmatodes, the fungus Melanodes affects different organs of the body, both in a primary and secondary form, which authorises it to be classified along with specific diseases.

The structure of the Fungus Melanodes in many respects resembles that of fungus hæmatodes, the more striking difference consisting in the dark brown or black colour of the one, contrasted with the pale white or ash colour of the other.

On dividing a melanoid tumor, its section presents, like the hæmatoid, a smooth, unctuous surface, a quantity of the soft matter which enters into its composition soiling the knife. Sometimes the whole surface presents a uniform dark-coloured homogeneous mass, and sometimes it consists of a greater or less proportion of the dark matter, mixed in patches, or in streaks, with a pale-coloured medullary substance.

The colouring matter can be separated by maceration from the rest of the diseased mass; and, when it is washed away, a structure more or less firm remains, distinctly circumscribed and insulated from the adjacent healthy structure. The black matter mixes readily with water, and stains paper or the hand precisely the

* Remarques sur l'Indurations Blanches des Organes, par Bayle Journal de Médecine, tom. ix.

colour of Indian ink. It has no smell, and seems more to resemble a secretion than a decomposition; it is, indeed, in every respect, like the black pigment of the choroid coat, or the colouring matter secreted in large quantities by the cuttle-fish. By an accurate examination of this colouring matter and the black pigment through a microscope, they appeared to me quite analogous.

When chemically examined, Brechet states, that the Melanoid tumor very much resembled blood in its composition; consisting, 1st, of a coloured fibrine. 2dly, Of a black colouring matter, soluble in diluted sulphuric acid, and in a solution of the sub-carbonate of soda; rendering these liquids of a red colour. 3dly, Of a small quantity of albumen. 4thly, Of sub-carbonate of soda, phosphate of lime, and oxide of iron.

The Fungus Melanodes undergoes a process of disorganisation similar to fungus hæmatodes, portions becoming softer, and the integuments covering it giving way, a dark coloured fungus growing out from the ulcerated opening. Whilst the primary tumor increases the secondary symptoms of the disease make their appearance, sooner or later, in like manner as observed of other specific diseases; and these symptoms consist, either in the glands in the immediate vicinity of the primary tumor becoming contaminated, or in melanoid tubercles forming in remote organs.

Fungus Melanodes has been observed in most of those organs which are liable to be affected with fungus hæmatodes. The skin, the thyroid gland, the uterus, the ovaria, the mamma, the eyeball, the stomach, have each been found affected with fungus melanodes in its primary form; whilst the lungs, the liver, the kidneys,

the omentum and mesentery, the brain and the heart, the medullary membrane of the bones and the cellular membrane, have been the seat of Tubercles, or of the secondary symptoms of Fungus Melanodes.

The melanoid tumor is by no means rare, and specimens of it are to be found in almost every museum. Dr. Baillie, however, does not seem to have ever remarked it. It has also been observed in several domestic animals, particularly in the horse.*

The fungus melanodes chiefly occurs in those advanced in life; whereas I have already stated, that fungus hæmatodes, like scrofula, was to be considered as a disease of infancy and youth. In this respect, therefore, the melanodes has a greater analogy to cancer than to hæmatodes. Like both cancer and fungus hæmatodes, it is accompanied by constitutional symptoms, and often destroys life without creating much manifest disturbance.

Of Compound Diseased Structures.

Though it cannot be doubted that scirrhus, scrofula, fungus hæmatodes, and fungus melanodes, have each a distinct character, yet it is of importance to be aware that several of these diseased structures may exist at the same time in the same mass or in the same organ, or either of them may appear along with diseased changes of structure of some other kind: this led Lænnec to form a class of "Compound Diseased Structures."†

* Breschet's Considérations, &c. &c.

† "Dégénérescences Composées."

Different diseases are seen existing at the same time in the lungs, brain, liver, and in the different coats of the intestines. A tumor is sometimes met with, one portion of which is scirrhous, another portion is medullary, and another is osseous or cartilaginous. It also happens that when a disease attacks an organ already changed in some part of its structure, the one disease produces a certain influence on the other. For example, an injury, as has been already noticed, often increases the growth of a scirrhous tumor, creating in it all the symptoms of simple inflammation; the common wart of the skin, from some accidental irritation, has often been known to become cancerous; one disease thus appearing either to become a complete conversion or transformation into another, or showing that two or more deviations from the natural structure may occur in the same part. So also it often happens that a syphilitic sore is accompanied by more or less common inflammation, a circumstance necessary to be attended to in the treatment of the disease; mercury increasing such an ulcer until the simple inflammation be subdued by antiphlogistic treatment.

Sometimes Compound Tumors consist of a simple juxta-position of two or more different structures, and sometimes they are formed of an intimate and apparently confused mixture of the primitive tumors. Frequently some portions of each of the component primitive structures may be distinguished, but in other instances it is not easy precisely to define the primitive structure, and this is to be considered, as Lænnec has justly observed, the conjectural part of pathological anatomy.

In all tumors it is not only difficult but impossible to describe the various modifications which result from the combination of scirrhus, fungus hæmatodes, and scrofula with one another, and with other morbid alterations of structure. The characters of different tumors are drawn from cases where one disease has alone existed; for, like colours, those that are primary are easily distinguished, yet language cannot describe their various and almost infinite combinations; therefore it is only in their unmixed state that we can learn to distinguish each morbid structure; their various complications must be afterwards discriminated.

It is not impossible that when an organ is thus affected with more than one disease, each different affection may exist in a different texture of the organ.

J. W.

PREFACE

TO THE FIRST EDITION.

Some diseases consist only in morbid actions, but do not produce any change in the structure of parts: these do not admit of anatomical enquiry after death. There are other diseases, however, where alterations in the structure take place, and these become the proper subjects of anatomical examination.

The object of this work is to explain, more minutely than has hitherto been done, the changes of structure arising from morbid actions in some of the most important parts of the human body.

This, I hope, will be attended with some advantages to the science of medicine, and ultimately to its practice. It is very much to be regretted that the knowledge of morbid structure does not lead with certainty to the knowledge of morbid actions, although the one be the effect of the other; yet surely it lays the most solid foundation for prosecuting such enquiries with success. In proportion, therefore, as we shall become acquainted with the changes produced in the structure of parts from

diseased actions, we shall be more likely to make some progress, though slowly, towards a knowledge of the actions themselves. The subject in itself is extremely difficult, because morbid actions are going on in the minute parts of an animal body excluded from observation; but still, the examination of morbid structure is one of the most probable means of throwing light upon it.

A second advantage arising from the more attentive examination of morbid structure is, that we shall be able to distinguish between changes which may have some considerable resemblance to each other, and which have been generally confounded. This will ultimately lead to a more attentive observation of symptoms while morbid actions are taking place, and be the means of distinguishing diseases with greater accuracy. When this has been done, it may, perhaps, produce a successful enquiry into the most proper method of treatment.

Another advantage arising from a more attentive observation of morbid structure is, that we shall be better fitted to detect diseased alterations in the organisation of parts which are but little, or not at all known. This will lay the foundation of our enquiry into the diseases themselves, so that we shall add to our knowledge of the pathology of the body, and perhaps also to our knowledge of remedies.

A fourth advantage still, from observing attentively morbid structure is, that theories taken up hastily about diseases will be occasionally corrected. The human mind is prone to form opinions on every subject which is

presented to it; but, from a natural indolence, is frequently averse to enquire into the circumstances which can alone form a sufficient ground for them. This is the most general cause of the false opinions which have not only pervaded medicine, but almost every other branch of knowledge. When, however, the mind shall be obliged to observe facts which cannot be reconciled with such opinions, it will be evident that the opinions are ill founded, and they will be laid aside. We grant, it does not always happen that men are induced to give up their opinions, or even to think them wrong, on observing facts which do not agree with them, but surely it is the best means of producing this effect; and whatever change may be wrought on the individuals themselves, the world will be convinced, which has fewer prejudices to combat.

A person who had previously attended very accurately to symptoms, but was unacquainted with the disease, when he comes to examine the body after death, and finds some of the appearances that are described in this Treatise, will acquire a knowledge of the whole disease. He will be able to guide himself on such knowledge in similar cases, and also to inform others. It may, perhaps, too, lead him to a proper method of treatment.

When a person has become well acquainted with diseased appearances, he will be better able to make his remarks, in examining dead bodies, so as to judge more accurately how far the symptoms and the appearances agree with each other; he will also be able to give a more distinct account of what he has observed, so that his data

will become a more accurate ground of reasoning for others.

The natural structure of most of the different parts of the human body has been very minutely examined, so that anatomy may be said to have arrived at a high pitch of perfection; but our knowledge of the changes of structure produced by disease, which may be called the Morbid Anatomy, is still very imperfect. Such changes have commonly been observed only in their more obvious appearances, and very seldom with much minuteness or accuracy of discrimination.

Any works explaining morbid structure which I have seen, are very different in their plan from the present: they either consist of cases containing an account of diseases and dissections collected together in periodical publications, without any natural connection among each other, or consist of very large collections of cases, arranged according to some order. In some of these periodical works, the diseased structure has been frequently explained with a sufficient degree of accuracy, but in all the larger works it has often been too generally described. The descriptions of the principal diseased appearances have also been sometimes obscured, by taking notice of smaller collateral circumstances which had no connection with them, or the diseases from whence they arose. 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. Besides,

the bulk of these very large collections prevents them from being generally in the possession of practitioners, and also renders them more difficult to consult.

In the present work it is proposed not to give cases; but simply an account of the morbid changes of structure which take place in the thoracic and abdominal viscera, in the organs of generation in both sexes, and in the brain. This will be done according to a local arrangement, very much in the same manner as if we were describing natural structure, and will be accompanied with occasional observations on morbid actions. My situation has given me more than ordinary opportunities of examining morbid structure. Dr. William Hunter's Museum contains a very large number of preparations exhibiting morbid appearances, which I can have recourse to at any time for examination. Being physician to a large hospital, and engaged in teaching anatomy, I have also very frequent opportunities of examining diseases in dead bodies. This work will, therefore, chiefly contain an account of the morbid appearances which I have seen myself; but I shall also take advantage of what has been observed by others. It is intended to comprehend an account of the most common, as well as many of the very rare appearances of disease in the vital and more important parts of the human body. From the nature of this undertaking it is evident, that it must be progressive: some appearances of disease will be observed in future, with which we are at present totally unacquainted, and others which we

know very little of now, will afterwards be known perfectly.

Although I have ventured to lay this work before the Public, yet I am very sensible of its imperfections. Some appearances are described which I have only had an opportunity of seeing once, and which, therefore, may be supposed to be described less fully and exactly than if I had been able to make repeated examinations. There are others which I saw long before I had formed any idea of this undertaking, and which I may be supposed to have observed less accurately than if I had had a particular object in view. There are others again which I have only had an opportunity of examining in preparations. In some of these, certain appearances may be supposed to be lost, which might have been observed had the parts been examined recently after death. All these are sources of inaccuracy, which may be said in some degree to be unavoidable. I have endeavoured, however, to be accurate; and if the Public should approve of my plan, I shall be very careful, by the addition of new materials, and by repeated observations, to render this publication less imperfect.

PREFACE

TO THE SECOND EDITION.

A SECOND *Edition of this Treatise is now offered to the Public. It is considerably enlarged, and I hope more correct than the former. The additions are principally derived from what I have remarked myself; but some are also taken from the observations of others, and more especially from those of Dr. Soemmerring, Professor of Medicine in the University of Mayence, one of the most distinguished anatomists in Germany. He was pleased to think so favourably of my attempt to improve the knowledge of diseased appearances in the human body, as to translate the first Edition of the Morbid Anatomy into the German language, and to add to it many new Cases, and copious Notes. It has given me the most sincere satisfaction, to find that our observations and opinions coincide so much. Had the plan of my work been different, I might have derived much more assistance from the valuable labours of Professor Soemmerring, but many of the additions which he has made do not strictly fall within it.*

To the Morbid Appearances I have attempted to subjoin the Symptoms connected with them. This part of the undertaking is attended with many difficulties; and I feel very sensibly, how much the execution of it stands in need of the kind indulgence of the Public. If this work shall ever come to another Edition, I hope to be able to render the account of symptoms less imperfect.

The difficulties which attend an attempt to ascertain the symptoms of diseases arise from various sources. The same symptoms are not uniformly connected with the same morbid changes of structure in the body. In many cases, too, the symptoms are nearly the same, where the morbid changes are very different. This is particularly exemplified in diseases of the brain, and of the heart.—Patients often explain very imperfectly their feelings, partly from the deficiency of language, and partly from being misled by preconceived opinions about the nature of their complaints.—Medical men also, in examining into the symptoms of diseases, sometimes put their questions inaccurately, and not unfrequently mislead patients into a false description, from some opinion about the disease which they have too hastily adopted. All of these are formidable difficulties, which obstruct the progress of our knowledge of the symptoms of diseases; but the accumulated observations of many individuals will probably, at length, in a great measure overcome them.

In describing the symptoms of diseases, I have not entered into a minute detail. This properly belongs to the plan of a writer, who proposes to take a full view of any particular disease. I have mentioned those symptoms only which are most constant, and most strongly characteristic of the diseases to which they belong. Many diseased appearances are described in this work, to which there are added no corresponding symptoms; and this depends on different causes. The first is, that there are many morbid changes of structure in the body, the corresponding symptoms of which are not ascertained. The second is, that many morbid changes of structure are produced by causes which disturb the constitution so little, as to be attended with symptoms too slightly marked to excite observation. The third and last is, that the symptoms belonging to some diseased appearances fall so immediately under the cognisance of the eye, or of the touch, as to be included in a description of the diseased appearances themselves, and to render any further account of them superfluous.

The account of symptoms is placed at the end of each chapter, after the description of the diseased appearances, that the anatomical part of the work may not be interrupted. In a very few instances, however, the account of the symptoms has not been separated from the anatomical description of the morbid appearances, viz. where so little of the symptoms was known as not to admit of a distinct account being given of them.

Besides an account of morbid appearances, some cases of malformation are blended in this work. They do not strictly fall within its plan; I have, therefore, added only a few which are important, and which have almost all occurred to my own observation.

London, Nov. 20. 1797.

THE

MORBID ANATOMY,

&c. &c.

CHAPTER I.

DISEASED APPEARANCES OF THE PERICARDIUM.

Inflammation of the Pericardium.

The Pericardium, or the membrane which surrounds the heart like a bag, and reflected upon its surface, giving it a smooth external covering, is liable to Inflammation. This is not a very common disease, although it happens sufficiently often to afford opportunities of examining its effects after death. The disease, from its nature, cannot be confined to any particular periods of life; yet from what I have seen, I should believe that it takes place more commonly when the body has been for some time in its adult state, than either in childhood or advanced age.

In Inflammation of the Pericardium, the membrane is generally thicker than in its natural state, and is also a little more pulpy. This change depends on ad-

ditional matter being thrown into the membrane by the increased action of the small vessels which are distributed upon it. It is also crowded with a very unusual number of minute vessels, which contain florid blood. On the inside of the Pericardium there is a layer of a yellowish pulpy matter, which commonly does not adhere firmly to it, but may be easily separated. It generally extends over the whole of its inner surface, and varies a good deal in its thickness. In some instances it is as thin as a wafer, and in others as thick as a half-crown piece. In this matter, lining the Pericardium, there is frequently to be seen a slight red appearance, from small blood vessels ramifying through it: but these are most distinctly detected by filling them with fine injection. They are sometimes numerous, and may be clearly traced passing from the pericardium into the pulpy matter; in which I have also seen small spots of florid blood. These newly formed vessels afford a very convincing proof of this extravasated matter possessing a living principle; for one cannot imagine that blood vessels would shoot into, and form a number of new branches in a substance which is dead.* On its inner surface, this matter very frequently throws out little irregular laminated pro-

* This is an argument used by Mr. Hunter, in support of the living principle of the blood. Professor Soemmerring does not seem satisfied with this proof of the coagulable lymph being alive when formed into layers upon the surface of inflamed membranes. To me, I own, there cannot be a stronger proof. Blood vessels might be supposed to pass through a dead substance, to be distributed upon one that is alive; but it is difficult to imagine what advantage could arise from the distribution of blood vessels upon a dead surface.

cesses, giving the appearance of a lacework; and junctions are often formed between that portion of it lining the pericardium, which is reflected like a bag, and the other portion lying upon the pericardium, which is the immediate covering of the heart. This matter has a very close resemblance, both in colour and structure, to the coagulable lymph of the blood, and is probably nothing else than this substance separated from the blood by a particular action of the small vessels of the pericardium.

At the same time that this layer of pulpy matter is formed upon the inner surface of the pericardium, there is accumulated in its cavity more or less of a brownish or yellowish fluid. There is sometimes only a few ounces of it; at other times more than a pint. In it are floating loose shreds of the pulpy matter formerly described, and there is also, occasionally, some mixture of pus. This fluid resembles in its properties the serum of the blood, and has commonly been considered as serum.

Inflammation of the Pericardium sometimes advances to form pus, although rarely. Of this I have seen one instance: the pericardium was much thickened, inflamed, and lined with coagulable lymph, and contained more than a quart of common pus; but there was no sign of ulceration in any part of it. This last circumstance will be more particularly noticed when I come to speak of the diseased appearances of the pleura. When that part of the pericardium is inflamed which forms the immediate covering of the heart, the muscular substance of the latter is occasionally inflamed to some depth.

When the pericardium, or any other membrane

lining a circumscribed cavity, is inflamed, and a layer of coagulable lymph formed upon its surface, a peculiar disposition is given to the coagulable lymph by the action of the small vessels which pour it out. This peculiar disposition is its tendency to immediate coagulation. As soon as the coagulable lymph is thrown out upon an inflamed surface, one must suppose that it immediately coagulates. If it did not immediately coagulate, but remained for some time fluid, as in the spontaneous separation of the constituent parts of the blood in a basin after common bleeding, then the coagulable lymph would form a small cake at the bottom of the serum, easily movable from one part of the cavity to another, and would not form a layer adhering to the surface of the inflamed membrane.

The serum is generally in a much larger quantity, than could take place in consequence of its mere spontaneous separation from the coagulable lymph which is spread upon the surface of the inflamed membrane. The blood vessels, therefore, which are distributed in the layer of the coagulable lymph, would seem to pour out some quantity of serum. While the inflammation is receding, and the coagulable lymph is changing into adhesions, the serum is generally taken up from the cavity; and this effect must be supposed to be produced by the action of absorbent vessels. The membrane of adhesions must therefore have absorbent vessels belonging to it, which have probably been formed by the elongation or growth of the absorbents of the inflamed membrane shooting into the coagulable lymph.

Besides serum, I have mentioned that pus is sometimes found in an inflamed circumscribed cavity. When

this is the case, it seems extremely probable, that the small arteries distributed in the layer of coagulable lymph have poured out the pus. This, I believe, has not hitherto been thought of; but it is difficult to conceive, under these circumstances, any other source, from whence the pus could be derived. If the pus be supposed to be formed by the arteries which ramify in the inflamed membrane itself, then it must transude through a layer of coagulable lymph, which is often of considerable thickness, before it accumulates in the cavity. This, however, is not likely; and as arteries pass from the original membrane into the layer of the coagulable lymph, it becomes more reasonable to suppose, that pus is formed by the arteries distributed in the coagulable lymph, than in the original membrane itself.

Adhesions of the Pericardium to the Heart.

In opening dead bodies, Adhesions of the Pericardium to the Heart are not uncommonly found. The adhesion is sometimes at different spots, at other times it is extended over the whole surface. It either consists of a thin membrane, or of a more solid matter. When it is a thin membrane, it exactly resembles the common cellular membrane of the body; and when the matter is solid, it differs only a little from the coagulable lymph of the blood recently poured out upon an inflamed surface. Whether the adhesion be in the one way or the other, the matter of adhesion is in both cases capable of being rendered vascular by injection. The adhesion, too, is in both

cases formed from the pulpy matter formerly explained, for I have oftener than once had an opportunity of tracing its gradual changes into each. Such adhesions are to be considered as the consequence of inflammation, and show that an inflammation of the pericardium may be survived. They connect the pericardium in different cases, more closely or loosely to the surface of the heart. Where the connection is close, the inflammation has probably been more recent, and where it is loose, the inflammation has probably been of older date, so that time has been given for the adhesions to be elongated by the motion of the heart.

Dropsy of the Pericardium.

Dropsy of the Pericardium is not uncommon, and I believe is most frequent at an advanced period of life. I have seen it, however, in persons considerably under the age of thirty; and it probably also happens occasionally in childhood. I have seen, oftener than once, both anasarca and ascites in children under twelve years old, which is as improbable as the accumulation of water in the pericardium. Water is sometimes found accumulated in the pericardium, while there is none in any other cavity; but, generally, it is accompanied with the accumulation of water in the other cavities of the thorax.

This water varies a good deal in quantity, amounting in some cases hardly to two ounces, and in others to more than a pint. Although the quantity accumulated be large, yet the pericardium is never very much stretched, but always appears as if it could contain a

greater quantity. It is probable, therefore, that the pericardium may really grow so as to keep pace with the accumulation; and this would seem to be necessary, in order that the heart may have room for dilating its several cavities.

The fluid which is accumulated is of a brown colour, has a darker or lighter shade in different cases, and resembles in its properties the serum of the blood. If the person should happen, at the same time, to have jaundice, then the fluid has a yellow tinge from the bile. It has, however, frequently a yellowish colour, like the serum, without there being any reason to suppose that bile has been circulating with the blood.

Scrofulous Tumors in the Pericardium.

I HAD once an opportunity of seeing two or three Scrofulous Tumors, growing within the cavity of the Pericardium, one of which was nearly as large as a walnut. They consisted of a white soft matter, somewhat resembling new cheese. The pericardium is a very unusual part of the body to be attacked by scrofula, and therefore this must be considered as a very rare appearance of disease.

The Pericardium almost Dry.

I HAVE twice found the Pericardium so changed as to resemble an ox's bladder in some degree dried, or like a pericardium which had been for some time exposed to the air; and Mr. Hunter has frequently seen similar

cases. As the thorax and abdomen were entire in both cases, no opening whatever having been made into either, this effect could not arise from evaporation. Were this capable of taking place, the appearance here noticed would be very usual in examining dead bodies, and the internal parts, generally, would be affected by the influence of the same cause. It must be considered, therefore, as the effect of a process which was going on during life. The cause of this appearance is either a defect in the action of the exhalent vessels of the pericardium, so that the fluid which naturally lubricates this part, is not secreted in the proper quantity: or, it is an increased action of the absorbent vessels of the pericardium, by which the lubricating fluid is taken up in larger proportion than it is deposited by the exhalent arteries.

Air in the Pericardium. (Ed.)

The Pericardium has sometimes, though seldom, been found to contain Air. Cases of this kind are mentioned by Portal, Senac, and Lieutaud. In one case Dr. Johnson found at least a pint of air in the pericardium. The heart was smaller, and the parietes were thinner than natural; they were also converted into a substance resembling fat. The patient had a peculiarly cadaverous appearance, and the circulation was extremely languid.

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The Pericardium Cartilaginous, and Bony.

A PORTION of the Pericardium has in some instances been observed to be converted into Cartilage*, and in others into Bone†, but both these changes are very uncommon. I once had an opportunity of examining an instance, in which the ossific process had spread over a considerable portion of the pericardium. A cartilaginous state of the pericardium has not fallen under my observation.

The Pericardium Wanting.

A FEW instances have occurred, in which the Pericardium has been wanting, from a defect of original formation. When this deficiency takes place, the heart appears perfectly bare and distinct to the eye, upon removing the sternum and the cartilaginous extremities of the ribs. The external surface of the different cavities and blood vessels of the heart is seen as distinctly as when the pericardium is laid open in the natural structure of these parts. A close and uniform adhesion of the pericardium to the heart has sometimes been mistaken for this malformation, but they are very different from each other. When there is a close adhesion of the pericardium to the heart, the external surface of the different cavities and blood vessels of this organ does not come into view, upon removing the sternum and a part of the ribs. The

* See Morgagni de Causis et Sedibus Morborum, epist. xxii. art. 10.

† See Bonnetus, tom. i. p. 583.

whole of this appearance is as completely hid as in the healthy structure. It is only when the adhesion is removed by dissection that the external surface of the heart and blood vessels comes into view. When there is an adhesion of the pericardium to the heart, this membrane adheres at the same time closely to the tendinous part of the diaphragm; but when there is an original want of the pericardium, the heart lies loose in the cavity of the chest, having no connection whatever with the diaphragm, and like the lungs is covered by the pleura.

SYMPTOMS.

The Symptoms attending Inflammation of the Pericardium cannot be distinguished from inflammation of the substance of the heart. Whenever the inflammation of the pericardium is violent, the muscular substance of the heart is inflamed to some depth, and therefore the inflammations of both parts are often blended together. The symptoms which have been observed, besides Symptomatic Fever, are pain in the region of the heart; most commonly, but not constantly, palpitations, and an irregular pulse: cough; difficulty of breathing; extreme anxiety of countenance; delirium; and sometimes syncope.

The Symptoms attending Adhesions of the Pericardium to the heart are not so clearly marked as to be well distinguished in practice. When the adhesions are partial and long, so that the heart can enjoy a free play within the pericardium, probably little or no in-

convenience is felt. But when the adhesions are close, and extend generally over the surface of the heart, the following symptoms have been observed: a sense of oppression, and sometimes of pain in the situation of the heart; a pulse often irregular and intermittent; difficulty of breathing, and sometimes a dry cough.

When Water is accumulated in the Pericardium, the symptoms very much resemble those belonging to Hydrothorax, and have not been clearly distinguished from them by authors. These symptoms will be afterwards mentioned when treating on hydrothorax. It may, perhaps, serve as an imperfect ground of distinction between the two diseases, that the feeling of oppression is more accurately confined to the situation of the heart, and the heart is more disturbed in its functions, in dropsy of the pericardium, than in hydrothorax. It ought at the same time to be remarked, that the two diseases are often blended; in which case, these grounds of distinction cannot be applied.

The case of Scrofulous Tumors growing on the inside of the Pericardium, which I have described, was combined with tubercles of the lungs; and the person died with the common symptoms of pulmonary consumption. Nothing occurred which led to any suspicion of a disease in the pericardium. It is reasonable to suppose, that when Scrofulous Tumors grow in the pericardium, there will hardly be any inconvenience felt while they are small; but when they enlarge very much they will necessarily prevent the full dilatation of the heart, and disturb its functions. This, however, will probably be very difficult to be distinguished from

the disturbance produced by other causes, which impede the free action of the heart; as, for instance, the accumulation of water in the Pericardium.

The Symptoms produced by a defect of the lubricating fluid in the Pericardium are at present unknown.

CHAP. II.

DISEASED APPEARANCES OF THE HEART.

Inflammation of the Heart.

INFLAMMATION of the substance of the Heart is a rare disease, and is most commonly connected with inflammation of the pericardium. When the pericardium covering the surface of the heart is inflamed, the inflammation sometimes passes a little way into the substance of the heart. That part of it becomes much more crowded with small vessels than in its natural state, and sometimes are to be seen in it a few spots of extravasated blood. The substance of the heart may, however, be inflamed, without inflammation of the pericardium. I recollect such an instance in which no marks of inflammation could be observed in that membrane, but there was a little more water than usual in its cavity.*

Authors have mentioned cases of Abscesses and Ulcers† of the heart, but these, I am persuaded, are extremely rare. It happens still more rarely that the heart becomes mortified, although this disease has also been observed.‡

* The Heart is also subject to Rheumatic Inflammation; for an account of which, see a paper by Sir David Dundas in the Trans. of the Med. and Chirurg. Society, vol. i. (*Ed.*)

† Vid. Morgagni, epist. xxv. artic. 17. Bonnetus, tom. i. p. 849.; and also Lieutaud, tom. ii. p. 27.

‡ Vid. Lieutaud, tom. ii. p. 33.

White Spots on the Surface of the Heart.

In opening dead bodies there is very often to be seen upon the surface of the Heart a white opaque Spot, like a thickening of the pericardium. This is sometimes not broader than a sixpence; at other times as broad as a crown-piece. It is most commonly on the surface of the right ventricle, and is rarely to be seen either on the surface of the left ventricle, or of the auricles, although it is occasionally on both.

This Spot consists of an adventitious membrane, formed on a portion of the pericardium which covers the heart, and may easily be dissected off, so as to leave the pericardium entire. It is an appearance, I believe, of no consequence whatever, and is so very common, that it can hardly be considered as a disease.

Unusual Fatness of the Heart. (Ed.)

The surface of the Heart is often covered with an unusually large quantity of Fat; and this is commonly found in persons who have little fat in other parts of the body; and even in some who are emaciated.

The Muscular structure of the Heart, Corvisart has found converted into a fatty substance.

Polypus.

Polypus has been considered by the older anatomists, as a very common and a very fatal disease. By

many of the moderns it has not been considered as a disease. It consists of a mass of coagulable lymph, which fills up some of the large cavities of the heart, particularly the ventricles, and extends into the neighbouring large vessels.

The coagulable lymph is of a yellowish-white colour, sometimes of a yellow colour, and has considerable firmness. It fills up the cavity completely, or nearly so, and in the ventricles it shoots out processes among the fasciculi of the muscular fibres. From this circumstance it has probably derived its name. It also extends into the larger arteries which arise from the ventricles, and is often moulded into the shape of the semi-lunar valves at their origin. The examples of this appearance which I have observed have been chiefly in preparations, and had undoubtedly taken place after death. In order that the circulation may be carried on, it is necessary that the cavities of the heart be free for the transmission of blood; and if any one of its cavities should be plugged up, the circulation would necessarily be stopped altogether. A polypus, however, plugs up the cavity of the heart, in which it is formed so entirely as to prevent the circulation. It may be said, perhaps, that polypi are formed gradually, and that the circulation is carried on for some time, although very imperfectly. In by much the greater number of polypi, however, there is an uniform appearance through their whole substance; which shows that all the coagulum had been formed at the same time. These circumstances seem to contradict strongly the opinion, that polypi in general are formed during life. When polypi are formed, I believe that the coagulation of the blood does not take place very

quickly after death. They are without any admixture of the red globules of blood, and therefore the blood has been sufficiently long in coagulating to allow the globules to separate from the other parts, in consequence of their greater specific gravity.

In some instances, a coagulum of blood has been found, of a laminated texture, in such parts of the heart as are most remote from the direct current of the circulation. This laminated texture shows that the coagulation had taken place during life, and in a gradual manner. Two cases of this kind have been observed by Mr. Brodie, who is well known as an excellent anatomist and physiologist. Such cases of coagulation are much less complete than those which have been generally called polypi, and which fill up entirely one or more of the large cavities of the heart.*

The ordinary coagulations of the blood commonly do not fill up very fully the cavities of the heart, although such instances occasionally take place pretty soon after death, because the red particles of the blood are generally arrested in the coagulum. It may be worth while to remark, that there is sometimes found a portion of coagulum in one of the ventricles, of a yellow colour, and with an oily appearance, so as exactly to resemble fat. There is, however, no admixture of oil in it, and it possesses all the ordinary properties of coagulable lymph. The yellow colour of a coagulum sometimes depends on a portion of bile having cir-

* I have seen a preparation of a Polypus in the left Ventricle, in the centre of which was a distinct Abscess. There is a case related by Mr. J. Stewart, in the Edin. Med. and Chirur. Journal of 1817, where "highly vascular Polypi" were found, one in the right Auricle, and one in each Ventricle. (*Ed.*)

culated with the blood during life, as in cases of jaundice; but it takes place also when there is no reason to suppose that bile is mixed with the blood.

Concretions in the Cavities of the Heart. (Ed.)

Concretions have been found lying loose in the Cavities of the Heart, resembling those met with in serous and synovial capsules. A case is accurately described by Mr. Wood*, where a spherical body measuring an inch and a half in diameter was found loose in the sinus venosus of the left auricle. It was composed of numerous, firm, concentric laminæ; in the centre of which was a cavity containing blood. Two solid bodies were also found in the right auricle of this heart.

Aneurism of the Heart.

It sometimes happens, although, I believe, very rarely, that the Heart becomes Aneurysmal. This disease consists in a part of the heart being dilated into a pouch, which is commonly more or less filled with coagulated blood. Of this disease I have only seen one instance. The apex of the left ventricle was dilated into a pouch large enough to contain a small orange, was much thinner than in the healthy structure, and was lined with a thick white opaque mem-

* In vol. x. of the Edinburgh Med. and Chirurgical Journal.

brane. There was hardly any coagulated blood contained in it; but the quantity of the coagulated blood, in an aneurism, depends commonly on the size of the bag.

This disease most probably arose from the muscular structure at the apex of the ventricle having become weaker than in any other part, so that when the ventricle contracted upon the blood, it was pushed against the weakened part, which was not fully able to resist its impetus, and therefore was gradually dilated. Had the strength of the apex of the left ventricle been in due proportion to that of the other parts, it would seem impossible that the aneurismal swelling should ever have taken place.

Aneurism of the Arch of the Aorta.

The most frequent situation of Aneurism within the cavity of the thorax is at the arch of the Aorta. In this disease the arch of the aorta is much enlarged, sometimes forming an uniform tumor; sometimes a large swelling, which arises out of the arch of the aorta by a neck or narrower portion; and sometimes smaller swellings arise out of the larger one. Where the swelling is uniform in its shape, there is reason to believe that there has been a considerable dilatation of all the coats of the artery. Where the swelling arises from the arch of the aorta by a neck or narrower portion, the inner and middle coats of the artery have been burst or ulcerated, and a dilatation takes place in the outer coat, which is strengthened by the condensation of the parts immediately surrounding it.

The coats of the artery, both at the place where the aneurism is formed, and near it, are considerably altered from their natural structure. They are more readily divisible into different layers, than where the artery is sound, and spots of bony matter are often formed in them. These spots are frequently of a yellowish colour, and are formed either in the internal membrane of the artery, or immediately behind it.

The coats of the artery, in the neighbourhood of the aneurism, are generally found to be very irregular in their texture, being in some places transparent and thin, in others thick and opaque; and there is sometimes the appearance of a double internal membrane. The same sort of structure is also sometimes found in the coats of the aneurism itself. The arteries near an aneurysm are diseased to a greater or less extent in different persons; but I do not recollect one instance in which they were totally free from disease.

The disease sometimes ends fatally, by the enlarged artery bursting, and the blood escaping into the cavity of the pericardium; but it often has a futher progress; the swelling of the aneurism gradually increases, till at length it presses against the sternum, and the cartilaginous extremities of some of the ribs. This pressure occasions a portion of the sternum and of the ribs to be absorbed, and the tumor is thereby perceived externally. The absorption of the sternum and ribs goes on very gradually, and is not accompanied with the formation of pus. The tumor gradually increases in size, till, perhaps, it is as large as a child's head at birth; a part of the skin becomes in some measure dead, and cracks from distention at the highest point of the tumor; a portion of the coagulated blood is

forced out by the impetus of the circulation, and the person, in general, is cut off instantaneously. The blood sometimes oozes out slowly, and the person sinks gradually under its loss.

Aneurisms at the arch of the aorta, as well as in every other part of the arterial system, generally arise from the coats of the artery being previously diseased, which are thereby unable to resist sufficiently the impetus of blood that strikes against them. This is obvious, both from the diseased structure of the coats of an aneurysm itself, and of the artery in its neighbourhood.

I have also found very frequently diseased appearances in the arch of the aorta, which had not advanced far enough to produce aneurism. These are white, or yellowish opaque spots, which present themselves to view on looking on the inner surface of the artery, and often consist of a curdy or atheromatous matter placed between the middle and inner coat. Under such circumstances, these coats of the artery are more easily separable from each other than in the healthy state.

The reason why aneurisms take place more frequently in the arch of the aorta, than in any other part of the arterial system, is its curvature, which exposes it to the full impetus of the blood propelled by the strength of the left ventricle. Aneurysms hardly ever happen in the pulmonary artery, because there is no arch formed by the pulmonary artery, and the blood readily passes by two large branches into the substance of the lungs.

Aneurisms in the arch of the Aorta, as well as in every other part of the arterial system, happen much

more rarely in women than in men. This arises from two causes: the one is, that women, from their sedentary life and temperance, are less liable to an increased impetus of the blood, occasioned by excited circulation; the other is, that the arteries in this sex appear to be less liable to those diseased alterations of structure, which predispose to aneurism.

Ossification of the Coronary Arteries of the Heart.

The Coronary Arteries are occasionally Ossified in a greater or less degree.* This state of them is, I believe, generally accompanied with ossified portions of the aorta at its origin, and sometimes with ossification of the semi-lunar valves.

Ossification of the Semi-Lunar Valves.

The three Semi-Lunar Valves at the origin of the aorta are often found diseased. The disease very commonly consists in the deposition of a bony or earthy matter, and should seem to be formed by a morbid action of some very minute vessels which are distributed through the substance of the valves. These vessels are so small, as not to contain, in their natural state, the red globules of the blood.

Similar valves at the origin of the pulmonary artery

* These concretions, so frequently met with in the heart and arteries, have been found by Mr. Brande to be composed of the Phosphate of Lime, Albumen, and a small quantity of Gelatine. (*Ed.*)

are occasionally more or less ossified, but by no means so frequently as those at the origin of the aorta. This, probably, depends upon their partaking of the same disposition with the pulmonary artery itself, the coats of which are much less subject to ossification than the coats of the aorta. When the mass of ossification in these valves is large, the aperture at the origin of the arteries becomes proportionably narrowed, and there is much more difficulty in the blood being propelled into them by the ventricles. In consequence of this impediment, the ventricles become considerably enlarged, and this change, for a reason lately given, is more apt to take place from this cause, in the left than in the right ventricle.

Semi-Lunar Valves thick and opaque.

It frequently happens that the Semi-Lunar Valves are considerably thickened, and of an opaque white colour: in this case, the coats of the artery, in the neighbourhood, are commonly thickened and diseased.

When the semi-lunar valves have undergone this change, the communication between the ventricles and the two large arteries must also be somewhat narrowed, and their office, as valves, must be more or less impaired. Neither of these effects, however, will take place in the same degree, as when there is a considerable deposition in them of osseous matter.

Rupture of the Valves.

THERE is a preparation in William Hunter's Museum, showing one of the semi-lunar valves thickened, and ruptured to a considerable extent. It is very rare that such an occurrence happens; and in this instance the rupture was so large, that I conceive it must have proved almost immediately fatal.

Valves between the Auricles and the Ventricles ossified.

THE valvular apparatus between the Auricles and Ventricles is liable to the formation of bony and earthy matter in it, in the same manner as the valves which are situated at the origin of the two large arteries, more especially of the aorta; but by no means so frequently. What this depends upon, it is very difficult to determine. These valves may, perhaps, be considered as belonging more to the venal than the arterial system, and it is certain that ossification takes place very seldom in veins, although very often in arteries.

The quantity of bony matter deposited in these valves is often very considerable, and of an irregular form. The aperture between the auricles and ventricles becomes thereby narrowed, and the valves have their mobility more or less impaired.

The same Valves thick and opaque.

THE valvular apparatus between the auricles and ventricles is also occasionally thickened, having lost

all its transparency, and having an opaque white colour. The chordæ tendineæ likewise become thicker than natural; and the internal membrane lining the ventricles is frequently at the same time a good deal thickened, appearing like a firm white membrane. When these valves have been for a long time either very much ossified, or thickened, the auricles of the heart are often found considerably enlarged.

I have also seen the valvular apparatus between the auricle and the ventricle, in a state of inflammation, and covered with a layer of coagulable lymph; but this I believe to be very uncommon.

Excrescences on the Valves of the Heart. (Ed.)

Corvisart has described an Excrescence or *Végétation* which he has in a few instances met with, growing from the Valves of the Heart. These excrescences were of an irregular form, resembling in some respects the warts which grow on mucous surfaces, and were attached to the semi-lunar valves. In one case I met with irregular masses attached to the Corpuscula Morgagni of the semi-lunar valves of the aorta, and one of them nearly as large as a field-bean adhered by a strong cord to one of the columnæ carneæ. It is probable that such growths are depositions from the blood in consequence of inflammation.

Rupture of the Heart.

It sometimes happens, and I believe chiefly in those who are advanced in life, that the heart at some part

becomes thinner, and upon any great exertion bursts. The blood escapes into the cavity of the pericardium, and the person is instantly destroyed.

Of this accident I have seen one instance only; but have heard from the best authority of another. They both happened to men; and I mention this circumstance, because men appear to be more subject to diseases of the heart and blood-vessels than women. It is probable that persons dying from this cause have, on account of the suddenness of their death, been supposed to die of apoplexy.*

Blood in the Pericardium, without a Rupture of the Heart.

Cases have occurred, although very rarely, in which a large quantity of Blood has been accumulated in the cavity of the Pericardium, but where no rupture could be discovered after the most diligent search, either in the heart itself, or in any of its vessels. This appears very wonderful, and not at all what any person would *à priori* expect. Upon the supposition of there being no rupture, two conjectures have occurred to me about the manner in which such an effect may have taken place, and they are both attended with considerable difficulty.

* Morgagni, Portal, Corvisart, and others, relate cases of the Heart being ruptured; and in most instances the rupture took place in the parietes of the left ventricle: violent exertions of the body, fits of passion, and epileptic paroxysms, were the most frequent causes. Dr. Whytt saw a Heart that had burst from excessive grief. See Critical Review, 1788.

The one is, that the vessels upon the surface of the heart may have lost a part of the compactness of their texture, so that the blood may have escaped through their coats by transudation. The other is, that blood may have been poured out by the extremities of the small vessels opening upon the surface of that portion chiefly of the pericardium which forms the immediate covering of the heart, from their orifices having been to a very uncommon degree relaxed.*

Malformations of the Heart.

It also happens, although, I believe very rarely, that a Heart is so imperfectly formed as to allow of life being continued for some length of time, in a very uncomfortable state, but to be ultimately the cause of death. There are two cases of this Malformation described by William Hunter†, and there is one specimen of it preserved in his Museum. It consists in the right ventricle of the heart, and the pulmonary artery arising from it, being extremely small. At its origin from the right ventricle it is completely impervious. The ductus arteriosus is open, but forms likewise a small canal, and terminates in the left branch of the pulmonary artery. The right auricle is larger than natural, from the frequent accumulation of blood in it; and the communication between the two auricles, by means of the foramen ovale, is much larger than usual.

* See Med. Observations, vol. iv. p. 330. Memoirs of Med. Society, vol. i. p. 238.

† Vide Medical Observations, vol. vi. p. 291.

The child in whom this malformation was found, had its skin of a very dark colour, and had very laborious respiration, with violent action of the heart. It lived only thirteen days.

In another case of Malformation related by William Hunter, the pulmonary artery was very small, especially at its origin, and there was a deficiency in the septum cordis, at the basis of the heart, large enough to allow a small thumb to pass through it. The person in whom this malformation of the heart was found lived about thirteen years. He never had a fresh complexion, but it was always dark, or tending to black. He was often seized with fits, especially when there was any hurry upon his spirits, or any brisk motion of his body.*

It is obvious that in these deviations from the natural structure, only a small quantity of blood can pass through the lungs to receive the benefit of respiration, and that this will be more or less according to the degree of the deviation. The blood will, from this cause, be of a dark colour, as it is well known that it receives the florid hue from the influence of the air when in the lungs. Hence the colour of the skin must be necessarily dark, and this will be increased when the blood is accumulated more than usual in the veins. It is natural to think that in such structures of the heart, the circulation will be carried on with much more difficulty when it is excited beyond its usual standard. This may even be supposed to be increased to such a degree as to produce fits, which happened in one of the cases.

* Vide Medical Observations, vol. vi. p. 291.

There is an example, also, in William Hunter's Museum of a child's heart which had a hole in the septum ventriculorum at the basis of the heart, large enough to allow a goose quill readily to pass through it. The child was stillborn at six months, and the hole in the septum evidently arose from original malformation. This case, too, is described by William Hunter in the sixth volume of the Medical Observations. An instance somewhat similar has been published by Dr. Pulteney, in the third volume of the Medical Transactions. The person in whom this monstrosity was found lived nearly fourteen years.

A very singular Malformation of the Heart, in a child about two months old, came, some time ago, into my possession: the aorta arose out of the right ventricle, and the pulmonary artery out of the left. There was no communication between the one vessel and the other, except through the small remains of the ductus arteriosus, which was just large enough to admit a crow quill. The foramen ovale was a little more closed than in a child newly born. The heart was of the common size for a child of two months old, and, except for the circumstances which have been stated, it had nothing remarkable in its structure. In this child florid blood must have always been circulating between the lungs and the left side of the heart, except for the admixture of the dark blood which passed through the small communication of the foramen ovale; and dark blood must have been always circulating between the right side of the heart and the general mass of the body, except for the very small quantity of florid blood which passed into the aorta by the remains of the ductus arteriosus. Life must,

therefore, have been supported for a very considerable length of time with hardly any florid blood distributed over the body. I regret extremely that I have only been able to collect a very imperfect account of the child when alive. The child had a most unusually livid skin, which arose from the very small proportion of the florid blood in the general circulation. The surface of the child's body felt colder than that of a child properly formed and in good health; the respiration was natural. When any similar malformation shall occur, it could be wished that the heat of the surface of the body, and of the internal parts, were accurately measured by a thermometer. The heat of the internal parts will be most conveniently measured by putting a small thermometer into the rectum.

Heart enlarged.

The Heart is not unfrequently found enlarged. This may occur in one or two of the cavities, or may extend to all the cavities of the heart. This change will sometimes take place in a small degree, and sometimes the heart is enlarged to twice or thrice its natural size. The muscular parietes of the heart are sometimes thickened along with this enlargement, but more commonly they are as thin, or even thinner than in the healthy structure. This state of the heart is generally accompanied with an ossification or a thickening of some of the valves, and has arisen from the diseased condition of the valves. It may however occur without any of the valves being diseased, or any apparent disease in the structure of the heart. Any cause

which would produce a strong and permanent impediment to the circulation of the blood through the lungs, or to the current of blood in the aorta near the heart, would in time produce an enlargement of it. The cavities of the heart in such cases are generally filled with blood, which is partly fluid and partly concreted into a loose coagulum.*

Hydatids adhering to the Heart.

HYDATIDS † have occasionally been found adhering to the heart; but I have not met with any instances of this. They do not appear to be of the same kind in every part of the body: but their nature will be explained particularly, when I come to describe the diseased appearances of the liver and kidneys.

A Portion of the Heart bony, or earthy.

A PORTION of the Heart has been observed to be converted into Bone.‡ Earthy matter has also been found deposited in the muscular substance of the heart.§ Neither of these appearances has come under my own observation, and they are both to be looked on as very uncommon.

* The Heart has frequently been found considerably diminished in size. (*Ed.*)

† See Morgagni, epist. xxv. art. 15.

‡ See Morgagni, epist. xxvii. art. 16. See also Medical Communications, vol. i. p. 228.

§ See Bonnetus, tom. i. p. 820. and p. 825.

Induration of the Parietes of the Heart. (Ed.)

Corvisart has, in a few instances, noticed an Induration of the muscular structure of the Heart, the fibres having become more rigid than natural, and lost, in a greater or less degree, their contractile power. In one case the heart, when opened, instead of collapsing, looked like a fleshy box. In another instance the parietes of the heart preserved the shape of its cavities, and these were sufficiently hard to resist compression, and to yield a sound when struck with the knife; and, on cutting, they afforded a singular crepitating sound. *

Flaccidity of the Parietes of the Heart. (Ed.)

The substance of the Heart is exposed to a kind of Softening, says Portal, which can neither be compared to the effect of gangrene, nor to a suppurative process. The Heart has been found so softened that it could be torn to pieces as easily as if it were in a state of putrefaction; but without exhaling a fœtid smell, or occurring in subjects who died of debility.

This Softening of the Heart sometimes appears in the greatest degree in the left ventricle, and in the thickest part of its parietes; and sometimes it is confined to the left ventricle, which makes it probable that the change takes place in the muscular fibre.

* See Corvisart, chap. iv.

SYMPTOMS.

The Symptoms which attend Inflammation of the Heart are very much the same with those which belong to Inflammation of the Pericardium; viz. symptomatic fever; more or less pain in the situation of the heart; palpitations; an irregular pulse; cough; difficulty of breathing; and often syncope. It would seem probable that syncope is principally connected with inflammation of the substance of the heart, and perhaps it may not be found in inflammation of the Pericardium. The two diseases, however, are very commonly blended together.

The Symptoms which attend Aneurism of the Heart are nearly similar to those which belong to aneurism of the arch of the aorta. The place of the pulsation will be lower than in aneurism of the arch of the aorta, and the space occupied by the pulsation will in general be larger than in aneurism of this part of the aorta.

The chief Symptom which attends Aneurism of the arch of the Aorta, in an early stage of the disease, is a strong pulsation in the chest. The pulsation is commonly at the same time visible to the eye, when the chest is exposed to view. We are not to conclude, however, from this symptom only, that there is certainly an aneurism. I have felt the same kind of pulsation in other cases; as, for instance, where the Pericardium was found strongly adhering to the heart; where there was a slight inflammation upon the sur-

face of the heart, with a little more water than usual in the Pericardium; and where a morbid enlargement had taken place in the heart without any aneurismal swelling. But when an aneurism of the arch of the aorta has advanced to a large size, a tumor begins to be formed externally, accompanied with a strong pulsation. This, I believe, belongs only to aneurism, and becomes the most decided characteristic of the disease. The pulse at the wrist in aneurism of the arch of the aorta is sometimes irregular; but often no irregularity can be felt. There is generally more or less pain in the aneurismal tumor, or in some other part of the chest. Difficulty of breathing on taking exercise also commonly attends it, which is increased in proportion as the disease advances, sometimes to a most distressing degree. It is not very unusual for patients to be destroyed by the pressure of an aneurism of the aorta upon the lungs and the other important organs contained in the chest, without the aneurism bursting, either externally or internally.

Ossification of the Coronary Arteries would seem to produce, or to be intimately connected with, the Symptoms which constitute *Angina Pectoris.* These consist of a pain which shoots from the middle of the sternum across the left breast, and passes down the left arm, to near the elbow, sometimes even to the wrist of the left hand. In a few cases, the pain has been known to shoot across the right breast as well as the left, and to pass down the right arm, to near the elbow or the wrist. It is excited by walking, more espe-

cially up an ascent, and by any considerable emotion of the mind.*

The Symptoms which are produced by a diseased alteration in the structure of the Valves of the Heart are not so distinct as to be clearly discriminated in practice. They consist of difficulty of breathing; of frequent palpitations; of a weak and often irregular pulse; and in some cases there has been a disposition to fainting. No observations have yet been made by which practitioners can ascertain with any precision what set of valves is diseased. †

The Symptoms which have been noticed as attending a gradual effusion of Blood into the Pericardium are a great degree of faintness; difficulty of breathing; much anxiety and oppression; a dull pain, and a sense of weight behind the sternum. To these a cold clammy sweat has been observed to succeed, and to spread over the body.

When the Heart is much enlarged, the disease is attended with palpitations. These may not only be felt by the hand, when applied to the left side, but may often be perceived by the eye, even when the chest is covered with ordinary clothing. In one or two instances, I have known the pulse at the wrist to beat

* See an excellent treatise on this subject by Dr. Parry.

† Corvisart has observed, that in the case of contractions at the orifices of the cavities of the Heart, from indurations or ossifications of their valves, the pulsations are irregular, almost always intermittent, and attended with undulations noise, and jarrings. (*Ed.*)

with an unusual degree of vigour, but much more commonly the pulse is feeble and irregular. The muscular parietes of the heart being generally thin in proportion to the enlarged size of its cavities, the heart has little power to propel an increased quantity of blood into the more distant branches of the arterial system. At times there is much difficulty of breathing, and there is a purplish hue of the cheeks and lips. This colour is more deep in its tinge at one time than another, according as the blood has been transmitted with more or less difficulty through the lungs. The causes which produce a morbid growth of the heart are probably not all of them yet ascertained. The chief cause is an ossification or thickening of some of its valves.

On some occasions the Heart becomes enlarged from rheumatism attacking it.*

The Symptoms produced by the formation of Hydatids in the cavity of the Pericardium are not distinctly known; but they cannot be supposed to differ much from those of water in the Pericardium. In a case related by Morgagni, the patient was subject to fainting.

When a part of the Heart is converted into an earthy matter or bone, no morbid symptoms whatever have, in some cases, been observed; and in others

* Dr. Pitcairn observed this in several cases; and he is to be considered as the first person who made this important observation. Its accuracy has since been confirmed by different individuals, of high professional character; so that it may now be regarded as an established pathological fact. See Trans. of the Med. and Chirurg. Society, vol. i., where there is an excellent paper on this subject by Sir David Dundas.

there has been palpitation of the heart, with difficulty of breathing.*

* Those who wish to consider this important subject more minutely, will consult with great advantage the excellent work of Corvisart on Diseases of the Heart.

He has noticed, that when the Muscular substance of the Heart is degenerated into fatty or opous matter, its pulsations are weak, slow, and generally almost insensible. (*Ed.*)

CHAP. III.

DISEASED APPEARANCES IN THE CAVITY OF THE THORAX.

Inflammation of the Pleura.

THE Pleura, or the membrane which lines the cavity of the thorax, is very subject to Inflammation. This may take place at any period of life, but it is more frequent at the age when the body is just arrived at the adult state, and all its actions are carried on with vigour, than either in childhood or in advanced age. The pleura appears to be more liable to Inflammation than any membrane lining those cavities which have no external opening, as the peritonæum, the tunica vaginalis testis, the membranes of the brain, and some others. This may arise from the following causes: — The branches of the intercostal vessels, which are very numerous, piercing through the substance of the intercostal muscles, communicate a good deal by anastomosis, with the external vessels on the sides of the chest. Hence whatever acts upon these external vessels, so as to excite contraction in them, may be supposed capable of producing an accumulation of blood, as well as an increased action in the inner branches of the intercostals, many of which are distributed upon the pleura. The inhabitants of this country, generally, from their mode of dress, have their

chests much exposed to the influence of a cold and very uncertain climate, and hence the blood is frequently thrown inwards into the small vessels ramifying upon the pleura. For these reasons, probably, the pleura is more liable to inflammation than other membranes investing cavities which have no external opening. This is so much the case, that one can hardly examine the chest of any person who has arrived at the adult state, without perceiving more or less the traces of recent or former inflammation.*

When the pleura is inflamed, it becomes thicker than it is naturally, and in some degree pulpy. There are also interspersed through it a great number of very small vessels containing florid blood, and a layer of coagulable lymph is at the same time formed upon its surface. This layer is sometimes very thin, and at other times of considerable thickness. It is either smooth on its surface, or it throws out many small flocculi, which exhibit the appearance of a rich lace-work. A serous fluid is also poured into the cavity of the thorax, in which float many small broken laminæ of the coagulable lymph; and there is occasionally some mixture of pus.

The coagulable lymph covering the pleura which forms the external membrane of the lungs frequently adheres to that which covers the pleura that is reflected on the inside of the parietes of the chest, either in small portions, or by extended surfaces. Upon such occasions, I have sometimes been able to trace the gradual change of the adhesion, from the state of

* Inflammation of the Pleura is also frequently produced by the respiration of cold air. (*Ed.*)

coagulable lymph to that of cellular membrane. This coagulable lymph may be shown to be vascular by injection, as has been already mentioned in treating of inflammation of the pericardium. When the pleura which covers the lungs is inflamed, the substance of the lungs is frequently inflamed to some depth.

Adhesions in the Cavity of the Thorax.

Adhesions are often found between that portion of the Pleura which covers the Lungs, and that other portion which lines the ribs, the intercostal spaces, and the convex surface of the diaphragm; while there is no sign whatever of present inflammation. These Adhesions are often partial, and then they are most commonly to be found at the upper and posterior part of the chest; but they are sometimes extended over the whole cavity. They either connect the parts together closely, in which case they often consist of a firm, thick membrane; or they connect them loosely, and then they consist of a soft spongy membrane, which exactly resembles the common cellular membrane of the body. Such adhesions are the consequence of inflammation, and are perhaps the most common morbid appearance found in dead bodies.

Concretions in the Thorax. (Ed.)

Concretions are occasionally formed in serous cavities, and in one instance I found one in the Thorax: in this case the concretion was not loose in the cavity,

but was attached to the lung by a few thin membranous bands. It was of the bulk of a small cherry, nearly globular, and consisted of a number of concentric laminæ, of a fibro-cartilaginous substance, with a nucleus of bone. It resembled in every respect the concretions found in the capsules of joints, in the cavity of the vaginal coat, and in the heart.*

Empyema.

Pus is not unfrequently accumulated in the cavity of the Chest, forming the disease called Empyema. This may either arise from the blood vessels of the pleura being in such a state of inflammation as to form pus, or from the bursting of some abscess in the lungs, so as to evacuate its pus into the cavity of the thorax. When Pus is formed by an inflamed state of the pleura, there is no occasion for ulceration to take place. The Pleura is found entire, but is covered with a layer of the coagulable lymph. This fact has been long ago ascertained by William Hunter. The formation of the Pus depends on a certain mode of action in the vessels of the Pleura, or more probably of the layer of the coagulable lymph which covers it. The Pus may either occupy the whole of one of the cavities of the chest, or may be confined to a part of it, by adhesions taking place between the lungs and that portion of the pleura which invests the ribs and the intercostal spaces. When Pus is evacuated into

* The particulars of this case, with an engraving, are given in the Edinburgh Med. and Chirurg. Journal.

the cavity of the chest by the bursting of an abscess in the lungs, it is almost always confined within certain limits by adhesions. In cases of Empyema, for the most part, there is not any particular appearance of the chest observable on the outside: there is sometimes, however, a fulness to be perceived externally on the side where the matter is accumulated, and even occasionally an evident swelling between two of the ribs, as if matter were pointing. Ulceration has also been known to take place in one or more of the intercostal spaces, so that the matter has been evacuated externally. There is an example in William Hunter's Museum, where the matter had been evacuated from the chest by several openings in the intercostal spaces.

Hydrothorax.

A WATERY fluid is not uncommonly found in one or both cavities of the chest, forming the disease called Hydrothorax. It is often attended with the accumulation of water in other parts of the body, especially in the pericardium, and in the cellular membrane of the lower extremities. The fluid in Hydrothorax is commonly of a brown or yellowish colour, but occasionally has a reddish colour, arising from the mixture of the red globules of blood. In its properties it resembles serum. It is found to vary a good deal in quantity in different cases; sometimes amounting only to a few ounces, and at other times to several quarts. When it is accumulated in very large quantity in either side of the chest, that side appears to be fuller to the eye externally; and when the cavity is laid open after

death, the lungs on that side are found more or less compressed. I have seen one of the lungs so compressed from this cause as not to be larger than the closed fist.

Water is likewise found in the cavity of the chest where there are considerable adhesions. This shows that a good deal of inflammation had formerly taken place, which had, probably, by throwing out a considerable quantity of serum, laid the foundation of the hydrothorax.*

Steatomatous Tumors and Hydatids.

Steatomatous Tumors and Hydatids have sometimes been found in the cavity of the pleura, but both of these morbid appearances are very rare.†

The Pleura almost dry.

In opening the cavity of the chest, there is commonly found a good deal of moisture upon the surface of the Pleura. This is intended to lubricate the surface of the cavity of the chest, for the more easy motion of the lungs within it. Sometimes, however, I have seen the moisture in very small quantity, so that the pleura might be said to be almost dry.

* This circumstance is illustrated in several instances by Mr. Cruikshank, in his Treatise on the Absorbent System. See 2d edition, p. 116.

† See Portal's Anatomie Médicale, tom. v. p. 26. and 27.

This was occasioned either by a deficiency in the action of the exhalent arteries of the pleura, or by an increased action of its absorbents.

Ossification of the Pleura.

It sometimes happens, although rarely, that a portion of the pleura is converted into Bone. This consists of a thin plate, and sometimes extends over a considerable surface of the pleura. In all the cases which I have seen, the bony matter seemed to be exactly like common bone. I have never seen it form a thick irregular knob, but always a thin plate. The cause which first excites this diseased process is very difficult to determine; but there can be no doubt that the bone is formed by the small vessels of the pleura, which secrete osseous matter from the blood. This process is not peculiar to the pleura, but takes place in almost every part of the body; I believe, however, that it is more common in the pleura than in any other similar membrane. In the cases which I have observed, this process seemed not to have been attended with much inconvenience. There was no inflammation found in the pleura surrounding the bone, nor in the substance of the lungs under it. It is reasonable to think, however, if the bone were to grow irregularly, so as to form sharp processes, that it might excite inflammation, and lay the foundation of a fatal disease.

SYMPTOMS.

The symptoms which attend Inflammation of the Pleura are very well ascertained. There is more or less of symptomatic fever; an acute and fixed pain in some part of the chest, more commonly in the side, which is increased upon inspiration; a great difficulty in lying upon the diseased side; difficult respiration; a cough, which at first is dry, but is afterwards accompanied with a secretion and expectoration of mucus from the mucous membrane of the trachea and its branches.

There would often seem to be slight degrees of inflammation in the pleura, where the symptoms above stated do not exist at all, or are so obscurely marked as to be altogether overlooked. In examining the chest of adults after death, it rarely happens that adhesions are not discovered in some part of it, uniting the surface of the lungs to that portion of the pleura which lines the parietes of the chest. The marked symptoms of pleurisy, however, are by no means so frequent. It seems, therefore, probable, that slight inflammations may attack the pleura, sufficient to throw out coagulable lymph, which is afterwards changed into adhesions, and yet that persons thus affected shall not be sensible of any disease in the chest. If this supposition be not granted, then coagulable lymph may be poured out upon the surface of the pleura, and adhesions be formed without inflammation: but this conjecture is not so probable as the other.

Where Adhesions in the Chest are long, so as not to impede the free motion of the lungs, respiration is

not sensibly affected by them. But where the adhesions are short, tying, as it were, the lungs closely to the parietes of the chest, and more especially if they be extended over every part of the cavity, then respiration is difficult, and accompanied with a cough, but there are no symptoms of fever.

Empyema may be distinguished with a good deal of certainty, after inflammation of the pleura or of the lungs; by rigors having taken place; by a remission of the pain; by the cough and difficulty of breathing continuing; and by the person being able to lie more easily upon the diseased side than the other. There is sometimes a very evident enlargement of the side where the matter is accumulated, and always a want of that hollow sound on striking with the fingers the side where the empyema is, which takes place upon striking the chest when the lungs are sound.

When Water is accumulated in the Chest, it can generally be sufficiently distinguished by the following symptoms: —

There is great difficulty of breathing, and commonly the patient cannot rest in bed unless the head, and upper part of the trunk, be more or less elevated. The sleep is often suddenly interrupted by alarms and disagreeable dreams; the urine is in very small quantity, and there is commonly anasarca of the legs. The pulse is generally, but not always, irregular. There is a paleness in the countenance, with a purple hue of the lips and cheeks; if the latter should happen to have any tinge remaining. This effect is produced by the lungs being incapable of sufficiently expanding

themselves to receive the quantity of air which is necessary for giving the usual florid colour to the blood in the branches of the pulmonary artery.

When Ossification of the Pleura is of small extent, respiration cannot be affected by it; but when it is large, it must produce difficulty of breathing, either by preventing the full expansion of the lungs, or the free motion of the ribs, according to its situation: some instances are known of respiration being injured from this cause.

Where the Ossification has produced inflammation of the pleura and lungs, symptoms of inflammation will take place as above described, but probably, in some cases, there may be peculiar symptoms, depending chiefly on the different irritability of different constitutions. In one case, there were paroxysms of convulsive difficulty of breathing, palpitation of the heart, a quick irregular pulse, and a distressing sense of instant suffocation.*

* See Mr. Weldon's Observations on Surgery, p. 75. and 76.

CHAP. IV.

DISEASED APPEARANCES OF THE LUNGS.

Inflammation of the Lungs.

INFLAMMATION of the substance of the Lungs seldom takes place without some similar affection of the pleura; at least in the instances which I have seen, this has been most frequently the case.* When a portion of the lungs is inflamed, its spongy structure appears much redder than usual, the colour being chiefly florid, though partly of a darker hue. This arises from a great number of the small vessels distributed upon the cells of the lungs being so enlarged as to admit the red globules of the blood. There is also an extravasation of the coagulable lymph into the substance of the lungs, and sometimes of blood. The extravasated blood has been said on some occasions to be in very large quantity; but this has never fallen under my observation.

That portion of the lungs which is inflamed becomes considerably heavier than in the natural state, from the accumulation of blood in its vessels, and the extravasation of coagulable lymph; it therefore commonly sinks in water. It feels like a solid substance when

* It may be proper here to observe, that Inflammation may attack either the serous or mucous surfaces, or the substance of the Lungs separately. (*Ed.*)

pressed by the fingers, and there is no crackling of air, as in the healthy structure. This, however, will be more or less marked, according to the degree of the inflammation.

The pleura covering the inflamed portion of the lungs is also commonly affected with inflammation: it is crowded with fine red vessels, and has generally lying upon it a layer of coagulable lymph.

This inflamed state of the lungs is to be distinguished from blood accumulated in some part of them after death, in consequence of gravitation. From the body lying in the horizontal posture after death, blood is generally accumulated at the posterior part of the lungs, there giving them a deeper colour, and rendering them heavier. In this case, there will be found no crowd of fine vessels filled with blood, nor will the lungs be found solid, but spongy in their texture, and there will be no other mark of inflammation of the pleura.

Where blood is accumulated from gravitation, in any part of a lung after death, it is always of a dark colour; but where blood is accumulated from inflammation, the inflamed part will appear, in a great measure, florid.

Abscesses of the Lungs.

It is very common to find Abscesses in the Lungs. These sometimes consist of small cavities containing pus, and at other times the cavities are very large, so that the greater part of the substance of the lungs has been destroyed. These cavities sometimes communi-

cate only with branches of the trachea, which are destroyed in the progress of the ulceration; at other times they open into the cavity of the chest, emptying their contents there, and forming the disease called Empyema. When abscesses are deeply seated in the substance of the lungs, the pleura is commonly not affected; but when abscesses are formed near the surface, it is almost constantly inflamed. The lungs round the boundaries of an abscess, when it has arisen from common inflammation, are more solid in their texture, in consequence of coagulable lymph being poured out during the progress of the inflammation. When the abscesses are scrofulous, the texture of the lungs in the neighbourhood is sometimes not firmer than usual, but presents the common natural appearance. This, I believe, to be principally the case when the abscesses are small, and placed at a considerable distance from each other. When a portion of the lungs is crowded with tubercles, and some of these are converted into abscesses, the intermediate substance of the lungs is often of a very solid texture. When blood vessels are traced into an abscess of the lungs, I have found them very much contracted, just before they reach the abscess, so that the opening of their extremities has been closed up entirely. On such occasions it will require a probe to be pushed with a good deal of force, in order to open again their extremities. In these contracted vessels the blood is coagulated, as it is under similar circumstances in other parts of the body.* This change in the blood-vessels is, no doubt,

* See Dr. Stark's Works, p. 28.

with a view to prevent large hæmorrhages taking place, which would be almost immediately fatal.*

Tubercles of the Lungs.

THERE is no morbid appearance so common in the lungs as that of Tubercles. These consist of rounded, firm, white bodies, interspersed through their substance. They are, probably, formed in the cellular structure which connects the air-cells of the lungs together, and are not a morbid affection of glands, as has been frequently supposed. There is no glandular structure in the cellular-connecting membrane of the lungs; and on the inside of the branches of the trachea, where there are follicles, tubercles have never been seen. Tubercles are at first very small, being not larger than the heads of pins, and in this case are frequently accumulated in small clusters. The lesser tubercles of a cluster probably grow together, and form one larger tubercle. The most ordinary size of tubercles is about that of a garden pea, but they are subject, in this respect, to much variety. They adhere closely to the substance of the lungs, have no peculiar covering or capsule, and have little or no vascularity. When cut into, they are found to consist of a white smooth substance, possessing a firm texture, and they often contain, in part, a thick, curdy pus. When a tubercle is almost entirely changed into pus, it appears

* Bayle observes, that there are two kinds of openings in the ulcerated cavity — one leads to the ramifications of the Bronchiæ, and these are round: others, which preserve the communication of the Tubercles with one another — these are irregular. (*Ed.*)

like a white capsule in which the pus is lodged. When several tubercles of considerable size are grown together, so as to form a large tuberculated mass, pus is very generally found on cutting into it. The pus is frequently thick and curdy; but when in considerable quantity, it is thinner, and resembles very much the pus from a common sore. In cutting into the substance of the lungs, a number of abscesses is sometimes found, from tubercles of a considerable size having advanced to a state of suppuration. In the interstices between these tubercles, the lungs are frequently of a solid texture, from the cells being in a great measure obliterated. The texture of the lungs on many occasions, however, round the boundaries of an abscess, is perfectly natural.

I have sometimes seen a number of small abscesses interspersed through the lungs, each of which was not larger than a pea. In these the pus is rather thicker than what arises from common inflammation, and resembles scrofulous pus. It is probable that these abscesses have been produced by a number of small scattered tubercles taking on the process of suppuration. The lungs immediately surrounding these abscesses are often of a perfectly healthy structure, none of the cells being closed up by adhesions.

When tubercles are converted into abscesses, Phthisis Pulmonalis is produced; one of the most destructive diseases in this island.* Tubercles are sometimes found in the lungs of children at a very early age, viz. two or three years old; but they most frequently

* The abscesses produced by the suppuration of tubercles Lænnec has observed to coalesce and cicatrise.

occur a short time before the completion of the growth. They are apt likewise to be formed at rather an advanced age.

On cutting into tuberculated lungs, a considerable portion of their structure sometimes appears to be changed into a whitish soft matter, somewhat intermediate between a solid and a fluid, like a scrofulous gland just beginning to suppurate. This appearance, I believe, is produced by scrofulous matter being deposited in the cellular substance of a certain portion of the lungs, and advancing towards suppuration. It seems to be the same matter with that of the tubercle, but only diffused uniformly over a considerable portion of the lungs, whereas the tubercle is circumscribed.

Granular Tubercle of the Lungs. (Ed.)

This Tubercle has been accurately described by Bayle, in his valuable work on Phthisis. The lungs are stuffed with miliary granulations, transparent, shining, and sometimes speckled with black and bright lines or points. The granulations appear to be of a cartilaginous nature and consistence; and their size varies from that of a millet-seed to that of a grain of wheat. They are always complicated with tubercular phthisis.

Soft pulpy Tubercle of the Lungs.

I have seen a Tubercle in the lungs, which I believe to be very rare. It consists of a soft tumor, formed of a light-brown, smooth substance. This is

not contained in any proper capsule, but adheres immediately to the common structure of the lungs. In cutting through several of these tumors I did not find any of them in a state of suppuration. They were commonly as large as a gooseberry, and were chiefly placed upon the surface of the lungs; some, however, of a smaller size were scattered through their substance. These are very different in their appearance from the common tubercle last described.

Scirrhous Tubercle of the Lungs. (Ed.)

When Scirrhous Tubercles affect the Lungs, they always appear as a secondary form of that disease. Such tubercles are usually numerous; affect the lungs of both sides of the chest, and are found immediately beneath the pulmonary pleura as well as imbedded in the parenchymatous substance of the lungs. They are distinctly insulated, and present the same characters as scirrhous tumors in other organs. They are usually found in the lungs of persons who have suffered from scirrhus of the mamma.

Hæmatoid Tubercle of the Lungs. (Ed.)

When Fungus Hæmatodes affects the Lungs, it always appears, like scirrhus, as a secondary form of that disease. The hæmatoid like the scirrhous tubercles appear imbedded immediately under the pleura as well as in the substance of the lungs, and they have all the characters of this species of tumor in other

organs of the body. They are generally numerous, and about the size of a common nut; and are found in persons who have had fungus hæmatodes in the testicle, extremities, or mamma.

Mælanoid Tubercle of the Lungs. (Ed.)

This species of Tubercle I have described in my treatise on fungus hæmatodes, but at that time the two tumors, the hæmatoid and mælanoid, had not been discriminated from one another. The melanoid tubercle has since been accurately characterised by Bayle, Lænnec, and several eminent French pathologists. This tubercle, like the hæmatoid and scirrhous, appears only as a secondary symptom; but, like the primary tumor, it is remarkable for its medullary structure, and dark colour, being of the hue of common ink.

Water accumulated in the Substance of the Lungs.

The structure of the Lungs may be said to consist of air cells, and the common cellular membrane of the body. In this cellular membrane there is always some moisture, which is necessary for the easy motion of one part of the lungs upon another during their contraction and dilatation. There is a considerable difference in the quantity of this moisture in different persons, as may be seen by cutting into the substance of the lungs; for, under such circumstances, there will always ooze out from the cut surface more or less of an

aqueous fluid mixed with globules of air. Sometimes, however, the quantity is so large that it amounts to disease, forming what may be called anasarca of the lungs. It has not occurred to me to see any well-marked example of this disease, but it has been observed by others.* It is hardly necessary to mention, that in proportion to the accumulation of water, the air cells must be necessarily compressed, so that a sufficient quantity of air cannot be admitted into the lungs for producing the due degree of influence on the blood.

The Lungs distended with Air.

On opening the chest, it is not unusual to find that the lungs do not collapse, but fill up the cavity completely on each side of the heart. When examined, their cells appear full of air, so that a prodigious number of small white vesicles are seen on the surface of the lungs immediately under the pleura. The branches of the trachea are often at the same time a good deal filled with mucous fluid. This fluid had probably prevented the ready egress of the air, so that it had gradually distended the air cells of the lungs, and had prevented the lungs from collapsing.

Air Cells of the Lungs enlarged.

The Lungs are sometimes, although I believe very rarely, formed into pretty large Cells, so as somewhat

* See Soemmerring's translation of the Morbid Anatomy, p. 45.

to resemble the lungs of an amphibious animal. Of this I have seen three instances. The enlargement of the cells cannot well be supposed to arise from any other cause, than the air not being allowed the common free egress from the lungs, and therefore accumulating in them. It is not improbable, also, that this accumulation may sometimes break down two or three contiguous cells into one, and thereby form a cell of a very large size.

Air Vesicles attached to the Edge of the Lungs.

Vesicles containing Air have occasionally been seen attached to the edge of the lungs. They do not communicate, however, with the structure of this organ, but are complete in themselves. On first view, it might be thought probable that they were merely some of the air cells enlarged; but as they do not communicate with any of the air cells, this opinion is not well founded. It is most likely that they are a morbid structure, formed in the same manner as the air vesicles attached to the intestines and mesentery of some quadrupeds, and that the very minute blood vessels which ramify upon the vesicles, have the power of secreting the air.*

The Lungs changed into a Substance like Liver.

The Lungs are sometimes converted into a solid substance very much resembling the liver. It has

* See Hunter's Animal Economy, p. 165.

nearly the same solidity with natural liver, and the same general appearance of structure. I have only seen one example of this change in a preparation, and I am inclined to believe that it had been produced by a widely extended inflammation, in which a large quantity of coagulable lymph had been extravasated into the substance of the lungs. The extravasation would necessarily render the texture of the lungs very solid; and the history of the symptoms which have been observed to attend similar morbid changes supports this opinion. The symptoms are those which are produced by inflammation of the lungs.

The Lungs converted into Bone.

PART of the Lungs is occasionally converted into a bony substance; but this is a very rare disease. The small vessels ramifying through the substance of the lungs under such circumstances separate bony matter from the blood. In the only instance which I have known of this affection, the process appeared to have been rapid. There was great difficulty of breathing, but this difficulty had existed only a very few weeks. Each of the lungs was undergoing the same change of structure, which had made considerable progress. In the particular case to which I allude, there had been a very strong disposition in the constitution to form bone. A very large bony tumor had formed round one of the knees of this person; and soon after the knee and leg were removed by amputation, the difficulty of breathing began, which had been occasioned by a part of the lungs being con-

verted into bone. In this case there was a transference of the disease from an external to an internal part, similar to the translation of gout or rheumatism.

A solid Tumor compressing the Lungs.

I HAVE seen a Tumor as large as an orange, attached to the Lung on one side by a loose membranous connexion, and in some degree compressing them; this tumor consisted of a porous substance, which resembled neither the structure of what is commonly understood to be a scirrhous, nor that of a scrofulous, tumor, but had an appearance somewhat peculiar to itself.

Earthy Concretions in the Lungs.

EARTHY Concretions have occasionally been found in the Lungs, although it is not a common appearance. These are generally small, but sometimes form masses of considerable size.* Even a considerable portion of the lungs has been known to be changed into an earthy substance.† These concretions consist of phosphate of lime, united to a thick membranous substance, which retains the form of the concretion.‡

Hydatids in the Lungs.

HYDATIDS are also sometimes formed in the Lungs, and many of them are brought up by coughing. They

* Vid. Morgagni, epist. xvii. art. 19. epist. xv. art. 25.

† Vid. Morgagni, epist. xxii. art. 15.

‡ See Thompson's System of Chemistry, vol. iv. p. 659.

are of the same kind as the hydatids formed in the liver, the nature of which I shall afterwards endeavour to explain.

SYMPTOMS.

In Inflammation of the substance of the Lungs, the Symptoms correspond a good deal with those of pleurisy. Indeed inflammation of the lungs is almost constantly attended with inflammation of the pleura, so that it is difficult to discriminate between them. But it is of little consequence to be able to do this, as the means of cure are the same in both diseases. When the inflammation exists in the lungs alone and the pleura is not affected, the pain in the chest has been observed to be more obtuse than in pleurisy, and the pulse to be less hard. The respiration is very difficult, and the veins of the neck are sometimes distended with blood, the face tumid, and there is a purplish hue of the lips and cheeks. These effects arise from the venal blood being transmitted with difficulty through the inflamed lungs. This is occasioned by an extravasation of the coagulable lymph into a considerable part of their substance, which both prevents the lungs from sufficiently expanding themselves, and compresses many air cells, so that the quantity of air admitted into the lungs is not sufficient for producing the full change of colour on the blood.

When inflammation of the lungs terminates in suppuration, it may be known by rigors, by a diminution of the pain in the chest, by an expectoration of pus, and sometimes, when an abscess is large, by bring-

ing up at once a great quantity of pus, which is generally a little tinged with blood.

When Tubercles are forming in the Lungs, but have not advanced to suppuration, they are attended with a slight cough, with occasional difficulty of breathing, with a feeling of slight pains in some part of the chest, and with a pulse somewhat accelerated. These are symptoms which commonly usher in phthisis pulmonalis, and are frequently overlooked, both by the patients themselves and their friends. When the tubercles have begun to suppurate, and abscesses to be formed, then there is an expectoration of a thick pus, which is occasionally tinged with blood, emaciation, debility, and that peculiar affection of the system known by the name of hectic fever.

The Symptoms attending the large Brown Tubercle are unknown to me.

When the Cells of the Lungs are much enlarged, persons have been long subject to difficulty of breathing, more especially on motion of the body; but I believe no Symptom is at present known, by which this disease may be discriminated from some others incident to the chest.*

* In two cases where I found the air cells much enlarged, the patients had been, for many years before death, afflicted with Asthma. Enlargement of the air cells is a common disease in horses, producing what is called Broken-wind. (*Ed.*)

In some cases in which the Lungs have been converted into a substance like Liver, Symptoms have been observed similar to those which attend inflammation of the lungs. I am inclined to believe that this appearance of the lungs is produced by an extensive extravasation of coagulable lymph into their substance, during inflammation.

When earthy Concretions are formed in the Lungs, persons are more or less subject to difficulty of breathing, and cough. Occasionally several of these concretions are coughed up, together, commonly, with a little blood; and by this circumstance alone can this disease be distinguished from some others incident to the chest. This state of disease often leads to phthisis. *

When Hydatids are formed in the Lungs, they produce a cough, difficulty of breathing, and some frequency of the pulse. They are occasionally forced up by a violent fit of coughing; and this circumstance only can discriminate the disease in the living body.

* These Concretions are often found in the Lungs of Gouty people, who have long been subject to what is commonly called, a Gouty Cough. Probably they resemble in their chemical qualities the arthritic concretions found in joints. (*Ed.*)

CHAP. V.

DISEASED APPEARANCES OF THE THYROID GLAND, THE LARYNX, AND THE PARTS CONTAINED IN THE POSTERIOR MEDIASTINUM.

BEFORE describing the diseased appearances of the parts contained in the posterior mediastinum, I shall take notice of the morbid changes to which the Thyroid Gland and the Larynx are liable. These are so closely connected with the trachea, that a description of their morbid changes could not be so properly introduced in any other place.

Inflammation of the Thyroid Gland.

THE Thyroid Gland is sometimes attacked with common Inflammation, but this happens rarely. There are no peculiar causes acting on it, to produce inflammation, and it would seem to be as little liable to this disease, as any gland in the body. When the thyroid gland is inflamed, it exhibits the common appearances which take place in the inflammation of the substance of other parts. Its blood vessels are enlarged, and the number of branches capable of containing the red globules of blood is increased. Hence it appears much more vascular than in a natural state. It is increased in bulk, and feels considerably firmer than when healthy; and these changes are produced partly by the increased quantity of blood which is circulating through

it, and partly by the extravasation of coagulable lymph, and, perhaps, of blood into its substance.

Bronchocele.

The morbid change of structure to which the Thyroid Gland is most liable, is that swelling called Bronchocele. This is apt to take place in different individuals of the same family, and women are more liable to be affected with it than men. It is more prevalent in some districts of countries than in others, and those where it is most prevalent are mountainous.

The swelling of the thyroid Gland in bronchocele often increases to a very large size, and sometimes grows irregularly, forming projecting tumors upon the anterior part of the neck. This irregularity of growth is more common in that part of Savoy, where the disease is endemial, than in Great Britain.

When a section is made of the thyroid gland affected with this disease, it is found to consist of a number of cells which contain a transparent viscid fluid. These cells vary in their size in different parts of the same gland, and in different swellings of the same kind in different individuals. Some of them are so large as to be capable of containing a small pea, but most of them are of a smaller size. When the gland has been preserved for some time in spirits, the viscid fluid is changed into a transparent jelly. From this account of the morbid change of structure which takes place in Bronchocele, it seems not unreasonable to suppose, that the swelling depends on a vitiated and increased secretion in the gland. The secretion being in large quantity,

gradually distends the cells, increasing thereby their capacity; and this enlargement of the cells forms the general swelling of the gland.*

Scirrhus of the Thyroid Gland.

The Thyroid Gland sometimes becomes scirrhous, but is not so liable to this disease as some other glands of the body. When it is affected by this disease, it becomes enlarged, but not to any considerable degree, and feels hard. When a section is made, it is found to consist of a solid substance, with very little of that cellular structure which is so strongly marked in bronchocele.

The Thyroid Gland is apt to become swelled and hard, when ulcers are formed at the upper end of the œsophagus. This effect is sometimes produced by the ulcer of the œsophagus extending to the thyroid gland. The same change, however, has been observed to take place where the ulcer had not reached so far, and where the gland was entire. This might lead to the opinion, that some ducts of communication exist between the thyroid gland and upper part of the œsophagus. The existence of such ducts has been supposed by several anatomists, but has never yet been demonstrated.

The Thyroid Gland converted into Bone.

The Thyroid Gland, or a part of it, is occasionally changed in old people into a bony mass; but this dis-

* In some cases of Bronchocele I have found the cells filled with blood. (*Ed.*)

ease is of rare occurrence. It is commonly, I believe, a disease of no consequence; but it is reasonable to think, that the bony mass, by an irregular growth, might in some instances so irritate the larynx, or the upper part of the trachea, as to produce inflammation and ulceration of these parts, and to prove ultimately fatal.

The Cartilages of the Larynx converted into Bone.

The Cartilages of the Larynx sometimes become bony, either at the middle or at a more advanced period of life. When the disposition to form bony matter in the larynx is not very strong, portions of the thyroid cartilage only are converted into bone; but when the disposition is powerful, then all the cartilages are changed into a bony substance. When this is the case, they become liable to any changes which might take place in ordinary bone. Accordingly some of these cartilages so changed into bone have been known to exfoliate, and to be thrown out by a violent fit of coughing or vomiting. William Hunter knew an instance where the cricoid cartilage, being converted into bone, was separated by exfoliation, and afterwards coughed up. It is not to be understood from what has been said, that the cartilages of the larynx, when changed into bone, are more liable to become dead and exfoliate than the common bones of the body. The instances in which they have been known to exfoliate are, I believe, extremely rare.

Ulcers in the Cavity of the Larynx.

The Mucous Membrane of the Larynx is very apt to become inflamed, and this generally accompanies

the inflammation of the mucous membrane of the trachea, as we shall have occasion to mention afterwards. Sometimes, however, an inflammation takes place which is confined to the cavity of the larynx, and it occasionally advances to suppuration and ulceration. Of this I have known several instances. Suppuration is most apt to take place in the sacculi laryngis: and the ulcers which I have seen there, are sometimes attended with a scrofulous thickening of the surrounding parts.

Warts on the Larynx. (Ed.)

In Mr. Heaviside's Museum, there is a preparation of the Larynx of a child, on the mucous membrane of which, and also on the epiglottis, are numerous Warts, resembling those so frequently observed on those parts of the body where the mucous membranes and skin unite.

Diseased Appearances of the Parts contained in the Posterior Mediastinum.

By the Posterior Mediastinum, is meant that space which lies between the laminæ of the pleura, which pass from the root of the lungs to each side of the spine. The space is of considerable size, and contains a portion of the trachea, of the œsophagus, of the thoracic duct, of the descending aorta, and the vena azygos, besides some absorbent glands.

Diseased Appearances of the Trachea.

The Mucous membrane of the Trachea is frequently inflamed to a greater or less degree. In this state it is

crowded with minute florid vessels, which give it a general appearance of vascularity. When there is no inflammation, it appears, in the dead body, a white pulpy membrane, and there are rarely to be seen any red vessels ramifying in it. While the mucous membrane is inflamed, the secretion from its glands is very much increased, and therefore its cavity is found a good deal filled with a mucous fluid; even pus is sometimes formed, and both fluids are mixed with globules of air. In some cases the inflammation has advanced to ulceration, and small ulcers have been found in various parts of the mucous membrane of the wind-pipe. The lungs, too, most commonly do not collapse; on the chest being laid open, and incisions made into the lungs, more or less of a frothy fluid escapes.* This is the state of the trachea in very violent catarrh, and also in some cases where there are scrofulous abscesses of the lungs. The same appearances are observable in the mucous membrane of the larynx.

Appearances of the Trachea in Croup.

When the Mucous membrane of the Trachea is inflamed, it is sometimes lined with a layer of a yellowish pulpy matter. This does not adhere firmly to the mucous membrane, but may be easily separated. It extends from the upper part of the cavity of the larynx, into the small branches of the trachea, which are distributed through the substance of the lungs. There is, at the same time, a good deal of mucus in the trachea and its branches, together with a mixture of pus. This is the appearance of the inside of the trachea, in patients who have died from croup.

* See Dr. Hastings's excellent treatise on Bronchitis.

Polypus of the Trachea.

The Trachea and its branches are sometimes lined with a layer of a yellowish or whitish matter, forming a sort of tube, which is loosely applied to the inner surface. This disease has been called a Polypus. It has not occurred to me to see any instance of it in the dead body, but I have seen it in preparations. The mucous membrane of the trachea seemed to be perfectly natural, and the layer of adventitious membrane exactly resembled the coagulable lymph which is formed in other parts of the body; I have therefore no doubt of its being that substance. From some accurate examinations of the wind-pipe in this disease, made by Dr. Cheyne, the mucous membrane has been found in a state of chronic inflammation.

The trachea is sometimes filled with a solid substance, of the same kind as that just described. Of this I have only seen one instance, and it occurs, I believe, much more rarely than the other.

The tubular substances which are thrown out from the trachea in coughing, and which constitute the most ordinary form of polypus, were considered formerly, by some anatomists of distinguished reputation, as blood-vessels. It is singular that they should have paid so little attention to the appearance of these tubular substances, as to have mistaken them for blood-vessels; and it is still more singular, that it should never have occurred to them, that blood-vessels of such a size could not be coughed up, without a very large quantity of blood escaping along with them.

A more modern opinion about the nature of these tubular substances has been, that they consist of dried

mucus. This, although more plausible than the former, is equally ill founded. The mucus which is secreted by the mucous membrane of the trachea is exactly of the same kind with that secreted by the mucous membrane of the nose. Every person is acquainted with the appearance of the mucus of the nose when dried. The mucus of the trachea, when dried, would have the same appearance. The tubular substances coughed up in polypus of the trachea present an appearance very different, and, as has been already observed, look exactly like the coagulable lymph. The influence of the air in drying the mucus would seem to extend but a little way beyond the external surface of the body, for the mucus is fluid even in the posterior nostrils.

Scirrhus of the Trachea.

I HAVE seen the Trachea narrowed in its diameter two or three inches, thickened in its substance, and a number of little hard tubercles formed upon the mucous membrane. This state of the trachea was accompanied with a scirrhous affection of some absorbent glands, which closely adhered to it; and it appeared to me that the disease in the glands had spread, so as to affect the trachea.

Rings of the Trachea Ossified.

THE Cartilaginous Rings of the Trachea occasionally become ossified. When the Ossification is inconsiderable, the function of the trachea will hardly be affected; but where the rings are entirely ossified, the flexibility of the trachea must be much lessened, and

its cavity will not admit of being so much contracted as in the healthy state, by the action of the muscular fibres, which form a part of its structure. In consequence of this, the mucus which is occasionally accumulated, will not be so readily expelled by coughing, and probably the air will not be thrown out in so small a column, with so much momentum.

Ulcers of the Trachea.

The Trachea is liable, like other parts of the body, to the process of Ulceration, from causes acting immediately on itself; but in the instances which I have seen, the ulceration has been connected with ulceration of the œsophagus. As the œsophagus is more liable to this disease, it is probable that in such cases the ulceration has begun in the œsophagus, and spread to the trachea.

Diseased Appearances of the Œsophagus.

The Œsophagus is frequently lined with a layer of coagulable lymph, which is continued from the cavity of the mouth.

This, it is said, sometimes extends over the whole intestinal canal; but I believe this appearance to be extremely rare, and it commonly terminates at the lower end of the œsophagus. The mucous membrane of the mouth is at the same time much more vascular than in its natural state, showing a deep red colour; but in examinations after death the appearance of greater redness is sometimes scarcely observable in the œsophagus. This disease is known under the name of

Aphthæ, and is more frequently observed in the living than in the dead body.

Spasmodic Stricture of the Œsophagus.

The Œsophagus is liable to Stricture, produced by the contraction of its muscular fibres at some particular part. This disease is most common in women whose constitutions are delicate, and much subject to nervous influence. When such a disease is examined in the dead body, the œsophagus is found to be more or less contracted in some part of it, and it feels harder than usual, as happens to all muscles in a contracted state. There is no appearance of diseased structure usually combined with it. I can suppose, however, that this contraction might lay the foundation of a permanent, and even fatal disease. The muscular fibres of the œsophagus might so press on the mucous membrane, as to excite inflammation in it, which might advance to suppuration, and would most probably terminate fatally.

Stricture from Puckering of the Mucous Membrane of the Œsophagus.

I once saw a very unusual Stricture of the Œsophagus. It consisted in its mucous membrane being puckered, so as to form a narrowness of the canal at a particular part, which would hardly allow a common garden pea to pass. There was no appearance, however, of diseased structure in the mucous membrane which was so contracted, and the muscular part of the œsophagus surrounding it was perfectly sound. This disease was very slow in its progress; for the person

in whom it took place had been for many years affected with a difficulty of swallowing, and could only swallow substances of an extremely small size.

Stricture attended with Ulcer.

The most common appearance of disease in the Œsophagus is that of an Ulcer in its cavity. Ulcers of the œsophagus are sometimes of a common nature, but are most frequently attended with a scirrhous affection. When they arise from common inflammation, the structure of the œsophagus immediately surrounding the ulcer is but little thickened, and there is an appearance of the usual erosion in ulcers. When the ulcer is of a scirrhous nature, the œsophagus in the neighbourhood is very much thickened, and is very hard in its texture. When this texture is examined, it either consists of a hard, uniformly fleshy substance, or is intersected by membranes, or is gristly. Under such circumstances the canal of the œsophagus is always more or less narrowed, and, in some cases, almost wholly obliterated. It is worthy of remark, that these ulcers happen most frequently, either immediately under the pharynx, or near the cardia.

Any substance capable of irritating the mucous membrane of the œsophagus, by having sharp hard projections, will unquestionably be more likely to affect the œsophagus, where it first enters into it. In an œsophagus, therefore, predisposed to scirrhus, such an accident may prove an exciting cause, and the disease will more frequently take place at its upper end. At the cardia, too, there is a peculiar arrangement of the muscular fibres, which are capable of acting in some

degree like a sphincter, and which probably produce on many occasions a narrowness of the canal there. This will render the œsophagus at the cardia more liable to be injured by the passage of any hard substance, and may, ultimately, lay the foundation of a scirrhous ulcer. This is the account which William Hunter used to give of the frequent situation of ulcers at the upper and lower extremities of the œsophagus. It happens, however, most commonly, that ulcers of the œsophagus arise spontaneously, or, in other words, from causes which we cannot ascertain. When an ulcer takes place at the upper end of the œsophagus, it is apt to spread into the substance of the thyroid gland; in this case the gland becomes hard, enlarged, and ulcerated: but in some instances it has been known to enlarge, where the ulcer of the œsophagus had not spread so far as to reach it.

Œsophagus Cartilaginous.

A PORTION of the Œsophagus, has been observed by some anatomists to be converted into Cartilage, and to have its diameter at that part very much diminished in size.* This was probably only a striking example of the gristly texture above described.

Fungus in the Pharynx.

I HAVE seen an instance of a Fungus arising on the inside of the Pharynx and the upper end of the Œsophagus: this is to be considered as a rare disease.

* Vid. Bonet, tom. ii. p. 32.

When cut into, it appeared to have a fibrous structure, disposed in some measure at right angles to the mucous membrane upon which it was formed, and it was ulcerated on its surface.

Scrofulous Swelling in the Pharynx.

It has occurred to me to see a Scrofulous Swelling at the lower end of the Pharynx and beginning of the Œsophagus. When cut into, it appeared to consist of the same kind of matter as a scrofulous absorbent gland. It grew on that side of the pharynx which is next the larynx, and the patient, for this reason, had not only lost almost entirely the power of swallowing, but was not able to speak, except in the slightest whisper.

Pouch formed at the Extremity of the Pharynx.

The Pharynx, at its lower extremity, has been known to be dilated into a Pouch of a considerable size, which passed behind the œsophagus. This may be supposed to be very rare, but there is an instance of it preserved in William Hunter's Museum. The pouch in this case began to be formed in consequence of a cherry-stone having rested there for some time, and which had made a kind of bed for itself. It remained in that situation for three days, and was then expelled by a violent fit of coughing. A part of the food always rested afterwards in the cavity made by the cherry-stone, and thus gradually enlarged it. At length, in the course of about five years, the cavity was enlarged into a bag of considerable size, sufficient

to contain several ounces of fluid. This bag passed down a good way behind the œsophagus, and the œsophagus necessarily acquired a valvular communication with it. In proportion as the bag enlarged, this valvular communication must have become more and more complete, till at length every kind of food must have rested in the bag, and could not pass into the œsophagus. In this way the person was destroyed. The lower end of the pharynx is, perhaps, the only part of the canal where such an accident can happen.

The pharynx is not contracted gradually, so as to lose itself insensibly in the œsophagus, but contracts itself rather suddenly at its lower end. Hence a little recess is formed, in which an extraneous body may occasionally rest. This would be most apt to happen at the posterior part; so that if the recess should be enlarged into a cavity, it would generally pass behind the œsophagus. The particulars of this singular case have been published in the Medical Observations.*

The Descending Aorta.

THERE is scarcely any other disease of the descending Aorta within the posterior mediastinum, besides its enlargement. This sometimes takes place to a great degree, and is attended with a diseased state of the coats of the Aorta. The coats become irregularly thickened, and more readily divisible from each other, than in a healthy state. Little thin laminæ of bone are frequently formed behind the mucous membrane, and small masses of curdy matter are there deposited. It is rare that this part of the aorta becomes enlarged,

* See the Medical Observations, vol. iii. p. 85.

unless there be a general disposition to enlargement over the arterial system.

The Vena Azygos Varicose.

The Vena Azygos is very seldom diseased. I have seen it, however, varicose, and very much enlarged. This change took place from particular circumstances: a considerable portion of the vena cava inferior had become obliterated; in consequence of this, the usual vena azygos, together with an uncommon one on the left side, were the only channels through which the blood could return by a circuitous route to the heart; they were, therefore, necessarily, from the impetus of the blood, much enlarged, and for the same reason, likewise varicose.

The Vena Azygos Ruptured.

The Vena Azygos has been known to be ruptured, when very much distended with blood.* Such a case has not come under my own observation, and I believe it to be very uncommon.

The Thoracic Duct Varicose.

The Thoracic Duct is subject to very few diseases. I have never seen any other, except that of its being very much enlarged and varicose.

In the instance to which I allude, it was very nearly as large as the subclavian vein, but nothing could be

* Vid. Morgagni, epist. xxvi. art. 29.

detected in the neighbouring parts, capable of accounting for this appearance. There was no obstruction at the entrance of the thoracic duct into the venal system, which might naturally have been expected. This diseased appearance of the thoracic duct has been taken notice of by Mr. Cruikshank, in his Treatise on the Absorbent System.*

The Thoracic Duct Obstructed.

The Thoracic Duct has been found obstructed by earthy matter deposited in its cavity.† It does not necessarily happen when the thoracic duct is obstructed, that chyle is prevented from entering into the circulating system. The thoracic duct sometimes sends off one or more considerable branches, which unite again with the principal trunk. If under such circumstances an obstruction should take place in a part of the principal trunk, between the origin and termination of those branches, no bad effect would follow; one or more of these branches would become enlarged, and convey the chyle in its full quantity to the blood.

The Thoracic Duct Ruptured.

The Thoracic Duct has also been known to be ruptured, although this is exceedingly rare.

Absorbent Glands Scrofulous.

The Absorbent Glands in the posterior mediastinum, as well as in every other part of the body, are liable to

* See second edition, p. 207.; and it is represented in an engraving, plate v.

† Vid. Lieutand, tom. ii. p. 93.

several diseases. The most common morbid affection is Scrofula. In this case the glands are frequently a good deal enlarged, and sometimes feel a little softer than in a healthy state. When cut into, they sometimes exhibit very much the natural appearance; but it is more common to find that some of them contain a white, soft, cheesy matter, mixed with a thick pus: this is the most decided mark of a scrofulous affection. When the absorbent glands in this situation are very much enlarged, they necessarily produce some difficulty of breathing, by pressing both on the lungs and on the trachea. They may also occasion some difficulty in swallowing.

Absorbent Glands Scirrhous.

I HAVE seen the Absorbent Glands in the neighbourhood of the trachea affected with Scirrhus, although this is a rare disease. They were much enlarged, and very hard to the touch. When cut into, they exhibited a hard texture, somewhat intersected by membrane, resembling what is called scirrhus in parts of the body. The trachea in contact with these glands was also affected. In this case the thyroid gland was scirrhous, and it is probable that the disease spread from the thyroid to the absorbent glands, and thence to the trachea.

Absorbent Glands converted into Bone.

THE Absorbent Glands near the Trachea are sometimes converted into a bony or earthy matter; and I think that this disease is more common in the absorbent glands at the root of the trachea, than in any other

part of the body. These glands, when so diseased, by pressing against the trachea or œsophagus, occasionally produce ulcers in them.

Diseases of the Anterior Mediastinum.

By the Anterior Mediastinum, is meant the space enclosed between the laminæ of the pleura, which pass from the sternum to the pericardium: it contains little else than cellular membrane, with, perhaps, a small portion of fat; and in the younger subject the thymus gland. It is seldom found with any diseased appearance in it. Abscesses are occasionally formed there. Water is sometimes found in the cells of its cellular membrane. I have also seen air accumulated in these cells.

Fat is occasionally deposited in the mediastinum in considerable quantity. When the quantity is very large, it has been known to disturb the functions both of the heart and lungs.

Scrofulous Tumors have also been known to be formed in the anterior mediastinum, but this morbid appearance occurs very rarely.* Two or three small absorbent glands are situated in the anterior mediastinum, and these may occasionally be enlarged from scrofula, but I do not recollect to have seen any instance of this having taken place.

Diseased Appearances of the Thymus Gland.

The Thymus Gland is subject to few diseases, and is only of temporary existence; few instances, therefore, of morbid structure have been observed in it.

* See Portal's Anatomie Médicale, tom. v. p. 30.

It seems very little disposed to inflammation; as abscesses have occurred in it very rarely, and have been but little noticed by authors.

It is more liable to be enlarged, and to become hard in its texture. I once saw an instance of this but had not an opportunity of examining it minutely.

Small Calculi have been said to be occasionally formed in the thymus gland.*

SYMPTOMS.

Inflammation of the Thyroid Gland may be known by an increase of its size and firmness, by pain felt in it, which is increased on pressure, and which is probably also increased during the act of swallowing. It may be distinguished from some other swellings of the gland, as, for instance, from bronchocele, by its rapid progress, by the feeling of pain, and by its not increasing to a very large size.

It is worth while to remark, that practitioners ought to be particularly cautious to prevent Inflammation of the Thyroid Gland advancing to suppuration. If it should suppurate, and the pus be evacuated externally, a scar will remain on the neck; and if the abscess point internally the pus will probably make its way into the cavity of the larynx or of the trachea, and suffocate the patient. There is a preparation in William Hunter's Museum, showing the fatal termination of inflammation in the thyroid gland. Every means should be attempted to make the inflammation terminate in resolution. When inflammation

* See Soemmerring's Translation, p. 61.

of the substance of any part terminates in resolution, the blood-vessels gradually return to their natural mode of action, and their natural size: the deep-seated absorbents are at the same time excited to an increased exertion, so as to remove the blood and the coagulable lymph, which had been extravasated during the inflammation. This is one of the chief uses of the absorbent vessels which are distributed through the substance of parts.*

Bronchocele may be distinguished from other swellings of the Thyroid Gland, by its slow growth, by the size at which it is capable of arriving, by its want of pain, by its commonly occurring at an early period of life, by the sensation it yields to the touch, which is more or less of firmness, but not of great hardness, and by the health being unaffected by it.

Scirrhus of the Thyroid Gland may be distinguished from other swellings of it, by great hardness, by occa-

* In the reduction of some of the deeper seated parts of the body from a state of enlargement to their natural size, there is a strong proof of a consent or sympathy existing between the superficial and deeper seated absorbent vessels. When, for instance, a swelled testicle is reduced to its natural size by rubbing mercurial ointment upon the surface of the scrotum, it cannot be supposed that any part of the ointment comes in contact with the absorbent vessels belonging to the substance of the testicle; yet these absorbents are excited to an increased action by the application of the ointment, and the testicle is at length reduced to its natural size. This effect should seem only capable of being explained on the principle of a consent or sympathy existing between the absorbents of the scrotum and the absorbents of the substance of the testicle, by which, when the former are stimulated, the latter are roused to an increased action.

sional darting pains in the gland, and by this affection being most apt to occur in persons of an advanced age. The swelling likewise in scirrhus of the thyroid gland is seldom so large as in bronchocele.

Ossification in the Thyroid Gland can only be ascertained by an accurate examination of the part affected. If the ossification be upon the surface of the gland, the bony matter will be distinctly felt under the skin; but if it should be deeply seated, it will be felt more obscurely, so as to leave the nature of the disease doubtful. When, however, it has made further progress, it will become perfectly distinct.

When the Cartilages of the Larynx are converted into Bone, the voice becomes hoarse, or is sometimes changed into a whisper. This may be easily explained, by the circumstance of the cartilages of the larynx having lost their flexibility, and being thereby rendered incapable of those finer motions which it is reasonable to imagine have considerable influence on the voice. In the cases which I have had an opportunity of examining, the ligaments which unite the cartilages were natural in their structure; had they been changed into bone, all the motions of the larynx would have been lost. It would then have been useless as the chief instrument of voice; but what would be the exact effect of such a change on various sounds transmitted through the trachea and the larynx, it is extremely difficult to determine. In some instances, where the cartilages of the larynx were converted into bone, there was a total inability of swallowing, which destroyed the patients. On examination after death,

no disease was observable either in the pharnyx or in the œsophagus. This inability of swallowing was probably produced by some of the ossified cartilages being enlarged posteriorly by a morbid growth, so as to encroach very much on the cavity of the pharynx. *

When Ulcers have formed in the cavity of the Larynx, there is a fixed pain in the situation of this organ, difficulty of breathing, and the patient can only speak in a whisper. This state of the larynx is accompanied with more or less symptomatic fever.

The Symptoms which attend Catarrh are too well known to require being mentioned. When there is a sense of soreness in this disease, passing down the middle of the chest, it arises from a considerable inflammation of the mucous membrane of the trachea. This inflammation soon goes off, but the increased secretion from the glands of the trachea often remains for a good while afterwards.

The Inflammation of the Mucous Membrane of the trachea, which is sometimes found in consumptive patients, continues more or less throughout the course of the disease in the lungs.

The Symptoms of Croup are, symptomatic fever, difficulty of breathing, a wheezing or croaking noise on inspiration, a hoarse voice, and a sort of ringing sound during coughing: portions of a whitish membrane and

* This occurred in a case described by Dr. Travers, of Newark, in Part I. of the VIIth Volume of the Medico-Chirurgical Transactions, pp. 151, 152. Dr. Robertson of Greenwich Hospital had observed the inability of swallowing in one or two similar cases.

pus are also occasionally coughed up. It may perhaps be reasonable to suppose that the whitish membrane is formed by some peculiar action of the blood-vessels of the mucous surface of the larynx and of the trachea, which is superadded to inflammation. In common inflammation of the mucous surface of the larynx and trachea, there is merely an increased secretion of mucus, or sometimes of pus; but in croup an adventitious membrane is always formed. This gives some probability to the supposition advanced; and it may perhaps serve to explain why croup is so rarely cured by the means which are known to remove common inflammation.

The Symptoms which attend a Polypus of the Trachea are, difficulty of breathing, a dry cough, and a frequent pulse, without any signs of inflammation. These, however, would not enable physicians to discriminate this disease from others, if portions of the polypus were not frequently coughed up. The disease is apt to continue a great length of time.

The Symptoms attending Spasmodic Stricture of the Œsophagus sufficiently characterise the nature of the disease. The difficulty of swallowing is not constant, but occasional. It comes on and goes off suddenly; and such changes are frequent There is no emaciation of the body, and the person generally seems to be in good health.

Stricture of the Œsophagus, which depends on a puckering of the mucous membrane, is slow in its progress. It may continue a great many years, and the

person seem to be in good health, except the difficulty of swallowing. The difficulty is constant, and distinguishes it from mere spasmodic contraction of the muscular fibres of the œsophagus.

The Symptoms which belong to Stricture of the Œsophagus depending on scirrhous thickening and ulcer sufficiently distinguish it from the other two diseases. The difficulty of swallowing is little at first, and gradually becomes worse, but is constant. When the disease has made considerable progress, the food is frequently rejected, and along with it there occasionally passes up some pus. The pulse at first is natural, but in the advanced stages of the complaint is frequent; and towards its termination the body becomes extremely emaciated. The parts in the neighbourhood of the disease are irritated to an increased secretion, which often produces a cough or hawking. Although towards the end of this disease hardly any nourishment can be got into the stomach, yet the feeling of hunger is not distressing.

When there is a Fungus, or a Scrofulous Tumor in the Œsophagus, the Symptoms correspond, I believe, very much with those of the scirrhous stricture of the œsophagus just described.

CHAP. VI.

DISEASED APPEARANCES WITHIN THE CAVITY OF THE ABDOMEN.

Ascites.

Ascites, or Dropsy of the cavity of the Abdomen, is a very frequent disease, and is not confined to any age or sex. I have seen several instances of it in children under ten years of age; but it is much more common at the middle and more advanced periods of life. It is also more common in the male than in the female sex. When water is accumulated in large quantity in the cavity of the abdomen, the superficial veins are generally a good deal distended with blood, which probably arises from the pressure of the water upon the deeper seated veins; but this distinction is sometimes hardly observable, even when the accumulation of the water is very considerable. The skin at the umbilicus is also often protruded, yielding easily to pressure; but this is not universally the case. On many occasions the protrusion can hardly be seen, though the water be accumulated in large quantity. On opening the cavity of the abdomen, a larger or smaller quantity of fluid is observed, which is generally of a brownish colour; but the colour varies according to circumstances. When there is a scirrhous liver accompanying the dropsy, the water is commonly of a yellowish or greenish colour. This arises from a mixture of the bile with the water;

and under such circumstances there is almost always a jaundice colour of the skin. I have seen the water in ascites of a chocolate or coffee colour; but this appearance is rare. In a case of this kind which I examined particularly, the water was thicker than that of ascites usually is; but it had the common properties, as far as could be known from the application of heat and of acids. When none of the viscera of the abdomen are diseased, the water in ascites resembles the serum of the blood in its colour, as well as in its other properties.

While water is accumulated in the cavity of the abdomen, the intestinal canal is frequently found somewhat in a contracted state; but often this is not observable. In many cases of ascites the liver is diseased, being hard and tuberculated, as shall be explained particularly when treating of the diseases of the liver. In some cases, too, the spleen has been found enlarged and hard.

Ascites is not necessarily connected with the accumulation of water any where else in the body; but it frequently happens that this disease is accompanied with the accumulation of water in the chest, and under the skin, particularly of the lower extremities.

Chyle in the Cavity of the Peritonæum.

Chyle has occasionally been observed effused into the cavity of the Peritonæum, from the rupture of some lacteal vessels; but this morbid appearance has occurred very rarely. In the cases to which I allude, the mesenteric glands were scrofulous, and some of the lacteals were ruptured, probably from the great ob-

struction to the passage of the chyle through these glands.*

Inflammation of the Peritonæum.

The Peritonæum is not uncommonly inflamed, although it is by no means so liable to this disease as the pleura. There is a cause of inflammation in it peculiar to women, which depends on a certain state of the womb after parturition. There is also a variety of causes producing it, which are equally applicable to both sexes, so that it is frequently found in men, and also in women who have not been pregnant.

When inflammation has taken place in the peritonæum, several appearances are observable on opening the body. The peritonæum is thicker than in its natural state, more pulpy, and less transparent; and it is crowded with a number of very small vessels, containing florid blood. When a portion of the inflamed peritonæum is separated from the abdominal muscles, there is commonly no appearance whatever of the inflammation having spread into the muscles; but where the peritonæum covers the intestinal canal, the inflammation is sometimes found to have penetrated not only into the muscular coat of the intestines, but even into the mucous membrane. The reason of this difference probably is, that the peritonæum is less connected with the abdominal muscles than with the intestinal canal, so that the inflammation passes less readily from the peritonæum to the former than to the latter part.

Inflammation of the peritonæum is sometimes slight and partial; at other times is great, and is spread over the whole membrane. When it is slight, and affects

* See Portal's Anatomie Médicale, tom. v. p. 115.

that part of the peritonæum which is connected with the intestinal canal, it often forms broad surfaces of inflammation, which run like bands along the course of the intestines, and are bounded by the contact of different portions of the intestines among themselves. In this case the coats of the intestines are not thicker than usual, the inflammation being slight, and confined to the peritonæum. Where the inflammation is great, the intestines are much thicker, and more massy. This evidently arises from the greater accumulation of blood in the small blood-vessels, as well as from the extravasation of fluids into the substance of the intestines, in consequence of the strong inflammatory action of the vessels. The mesentery and mesocolon are much thicker than in their natural state, and there is also a remarkable change in the omentum. This is frequently as thick as a person's hand, and lies as a circumscribed mass along the great curvature of the stomach. The principal cause of the change in these parts is the extravasation of coagulable lymph into the cellular membrane between the laminæ of the peritonæum which form them.

In many places there is formed a layer of a yellowish pulpy matter, gluing different portions of the abdominal viscera together. This layer is sometimes thin: at other times it is of considerable thickness, and appears to be the coagulable lymph of the blood. There is also a considerable quantity of a brownish fluid in the cavity of the abdomen resembling serum, which is mixed with small shreds of coagulable lymph, and sometimes with pus, giving it a turbid appearance. The quantity of the coagulable lymph, and of the fluid, is sometimes large, in proportion to the degree

of the inflammation. In some instances, instead of serum a large quantity of pus is found. Air, too, is sometimes accumulated in the stomach and the intestinal canal, which had been formed in the progress of the disease. This accumulation of air is most common when the inflammation is slight, and passes in bands along the surface of the intestines.

Adhesions in the Cavity of the Abdomen.

When there has been inflammation of the peritonæum either generally or partially, sufficient to have formed a layer of coagulable lymph, and the patient has survived the disease, the coagulable lymph is changed into a fine transparent membrane, which is the membrane of adhesions. The time which is occupied in the change of the coagulable lymph into the membrane of adhesions is not very long; for I have had several opportunities of tracing the gradual progress of the change from the one into the other, while the inflammation appeared to have been recent. This membrane consists of a cellular substance, similar to the general cellular membrane of the body, and has a moderate share of vascularity. It does not naturally show many vessels large enough to admit the red globules of the blood; but it shows its vascularity on slight degrees of inflammation, or when its vessels have been filled with fine injection. This membrane is capable of elongating gradually by the motion of the viscera, so as ultimately to be attended, in general, with very little inconvenience. I have very often had an opportunity of observing these adhesions, either joining all the viscera of the abdomen more or less to-

gether, or joining some particular viscera to each other.

Scrofulous Masses adhering to the Peritonæum.

I HAVE several times had an opportunity of observing a white, soft, granulated matter, adhering universally behind the Peritonæum. In some places it formed a mass of considerable thickness; in others it was scattered in small masses. In one case I recollect that it formed a substance as thick as my hand, between the peritonæum and the abdominal muscles, while it was scattered in small separate portions in the mesentery and the peritonæum covering the intestinal canal. The omentum I have sometimes seen changed into a cake of this substance. The matter itself appears to be scrofulous, for it resembles exactly the structure of a scrofulous absorbent gland, before pus is formed. I am not at all certain how far this appearance of disease should have been classed along with those of the peritonæum: it does not take place, at least in the cases which I have seen, in the peritonæum itself, but behind it, yet at the same time adhering to it. It appears, however, upon the whole, to be treated of here with more propriety than it could have been any where else.

Scirrhous Tumors adhering to the Peritonæum.

I HAVE also seen some small Scirrhous Tumors growing from the Peritonæum. These were extremely hard, of a white colour, and resembled exactly in their structure the cancerous masses which are formed in the stomach. What renders the nature of the ap-

pearance I allude to beyond doubt, is, that in the same body I found a cancerous tumor of the stomach. The cancerous tumors of the peritonæum were not at all connected with the latter, but were in that part of the membrane which lines the recti abdominis muscles, nearly opposite to the region of the stomach.

Cartilaginous Excrescences growing from the Peritonæum.

In one case I have seen a great many Cartilaginous Excrescences growing from the Peritonæum. They were of a small size, most of them being not larger than a garden pea, and they grew from every part of the membrane. They were a little softer than the cartilages which cover the extremities of bones, but had the true structure of cartilage.

Steatomatous Tumors adhering to the Peritonæum.

Steatomatous Tumors have also been observed adhering to the Peritonæum; but these are of very rare occurrence. *

Hydatids in the Abdomen.

Hydatids have occasionally been found to occupy a portion, or even the whole, of the cavity of the abdomen. In such cases they are connected with the viscera, and chiefly with the liver or the spleen. They may, however, be attached to any viscus, or to any

* See Soemmerring's Translation, p. 70.

part of the peritonæum. This appearance of disease is uncommon.

Air in the Cavity of the Abdomen.

Air has been said to be occasionally accumulated in the cavity of the abdomen, while little or none is contained in the intestines.* This I believe to be a very rare occurrence. Air is not unfrequently accumulated in considerable quantity in the intestinal canal, while there is none in the cavity of the abdomen. When a large quantity of air is accumulated in the bowels, they become greatly distended, and their coats proportionably thin. By the bowels lying in close contact with the peritonæum which lines the muscular parietes of the abdomen, there is the same feeling of distension when the hand is pressed against the surface of the abdomen, the same quick re-action upon removing the hand, and the same hollow sound, when the abdomen is struck by the fingers as if that cavity itself had been filled with air. This has, probably, given rise to the opinion, that the air is often contained in the cavity of the abdomen; I can believe, however, that air may, on some occasions, be accumulated in this cavity, but it is very uncommon. A part of the intestine when very much distended with air may burst, and a portion of the air may escape into the cavity of the abdomen; or the small arteries of the peritonæum may secrete air in the same manner as it appears to be formed by the mucous membrane of the stomach and the intestines. Portal has mentioned a remarkable instance which he met with in a

* Vid. Lieutaud, tom. i. p. 432.

woman about fifty years of age, in whose abdomen, after death, he found a large quantity of air, not accompanied with any rupture of the intestines, or with organic disease of any of the abdominal viscera.*

Diseased Appearances of the Omentum. (Ed.)

There is sometimes an enormous increase in the natural quantity of Fat in the Omentum. The omentum is subject to Inflammation, and often contracts Adhesions with contiguous portions of the bowels.† Fluids sometimes collect between its laminæ, and I have found both Scirrhous and Hæmatoid Tubercles interspersed over it. The omentum is also subject to Malformations, and in some instances has been found to be twisted in such a manner round portions of the intestinal canal as to produce Strangulation.

SYMPTOMS.

The Symptoms which belong to Ascites are almost too well known to require being mentioned here. There is commonly a distinct feeling of fluctuation on applying one hand to the abdomen, and striking it with the other; the urine is small in quantity, and of a deep colour; there is thirst, often some feverish heat, and a pulse more frequent than in health. The breathing is likewise difficult when the water is accumulated in very large quantity.

The Symptoms attending Inflammation of the Peri-

* See Portal's Anatomie Médicale, tom. v. p. 3.

† See page 129.

tonæum are fixed pain in the abdomen, which may vary in degree, but never disappears, with some swelling, and a great sense of soreness to the touch. The bowels are often costive, the pulse is frequent and hard, and the other phenomena of symptomatic fever are strongly marked. When the inflammation is slight, I have known the pain to be very inconsiderable, and the pulse little increased in its frequency, so that inflammation of the peritonæum had not been suspected. On examination, however, of the body, no other diseased appearance than a slight inflammation of the peritonæum was discoverable.

There are no Symptoms which mark the existence of Adhesions in the Abdomen; and they seem to be attended, in general, with no inconvenience to the functions which are carried on in that cavity. If, however, an adhesion should form a chord crossing a portion of intestine, and so pressing it as to interrupt its cavity, it may produce a fatal obstruction.

The Symptoms which belong to Scrofulous and Scirrhous Tumors of the Peritonæum are unknown to me.

I know of no Symptoms produced by Cartilaginous excrescences growing from the Peritonæum. It is probable that they are generally not observable, or not capable of being discriminated.

When Hydatids are accumulated in large quantity in the Abdomen, it will require some attention to distinguish this disease from ascites. It may be

distinguished, however, in the following manner. In the case of hydatids, the feeling of fluctuation on striking the abdomen with the hand will either take place very indistinctly, or not at all; whereas in ascites attended with no extraordinary symptoms, it is always distinct. The swelling in ascites is always uniform, but in an accumulation of hydatids it is more or less unequal. In hydatids it will be found, on enquiry into the history of the case, that the swelling first began in some determined place, whereas in ascites there is a gradual swelling of the whole abdomen.

It will be more difficult to distinguish an accumulation of hydatids from a dropsy of the ovarium than from ascites. The distinction between these two diseases should seem to be only capable of being determined by an accurate enquiry into the history of the case. In dropsy of the ovarium the swelling is first perceived on the side of the lower part of the belly, and it gradually increases upwards, so as to occupy a great part of the cavity of the abdomen. As hydatids most commonly grow from the liver, the swelling in this case will generally be first sensible at the upper part of the belly, and then spread downwards. Hydatids, however, may be formed in any part of the abdomen, and therefore were they to begin to be formed at the side of the lower part of the belly, it seems hardly possible to distinguish the one disease from the other.

CHAP. VII.

DISEASED APPEARANCES OF THE STOMACH.

Inflammation of the Stomach.

It sometimes happens, although not very frequently, unless* poisons have been swallowed, that Inflammation takes place in the Stomach, and spreads over a very considerable portion of its mucous membrane, or perhaps over the whole of it. It is much more common for inflammation to occupy a smaller portion of the stomach. In such cases the inflammation is generally not very violent. The outside of the stomach, at the inflamed part, shows a greater number of small vessels than usual, but is commonly not much crowded with them. On opening the stomach, it is found to be a little thicker at the inflamed part, the mucous membrane is very red from the number of small florid vessels, and there are frequently spots of extravasated blood. It does not often occur that common inflammation of the stomach proceeds to form pus, or to terminate in gangrene.

When arsenic has been swallowed, which is the poison most freqently taken, the stomach is affected with an intense degree of inflammation. Its substance becomes thicker, and there is a very great degree of redness in the mucous membrane, arising partly from

* It may be here noticed that Inflammation affects either the inner or mucous membrane, or the outer or peritoneal covering of the stomach, separately or conjointly. (*Ed.*)

the great number of minute vessels, and partly from extravasated blood. Portions of the mucous membrane are sometimes destroyed, from the violent action that has taken place in consequence of the immediate application of the poison. I have also seen a thin layer of coagulable lymph thrown out upon a portion of the inner surface of the stomach. Occasionally, too, some part of the arsenic is to be seen in the form of a white powder, lying upon different portions of the mucous membrane. I have been informed, that in two cases where arsenic had been swallowed, and had destroyed the persons by producing violent inflammation of the stomach, ulcers were found, on examination after death, at the lower end of the rectum. These persons had never complained of any disease in the rectum previously to swallowing the arsenic, and were apparently in good health. This circumstance is stated from good authority, and may have been produced by some of the arsenic having passed along the whole track of the intestines, and being ultimately lodged between some of the folds of the inner membrane of the rectum.

Appearances in Hydrophobia.

On opening the bodies of persons who have died from Hydrophobia, the mucous membrane of the stomach is frequently found inflamed at the cardia, and at its great end. The mucous membrane of the pharynx and the œsophagus is also inflamed. The membrane is not thickened by the inflammation, but the inflammation spreads as in erysipelas, showing in some places a distinct line of boundary. This inflam-

mation is commonly not violent, and is sometimes hardly observable.

Ulcers in the Stomach.

Opportunities occasionally occur of observing Ulcers in the Stomach. These sometimes resemble common ulcers in any other part of the body, but frequently they have a peculiar appearance. Many of them are surrounded with scarcely any inflammation, have not irregular eroded edges as ulcers have generally, and are not attended with any particular diseased alteration in the structure of the stomach in the neighbourhood. They appear very much as if, some little time before, a part had been cut out from the stomach with a knife, and the edges had healed, so as to present an uniform smooth boundary round the excavation which had been made. These ulcers sometimes destroy only a portion of the mucous coat of the stomach at some one part, but occasionally they destroy a portion of all the coats, forming an opening in the stomach. When a portion of all the coats is destroyed, there is sometimes a thin appearance of the stomach surrounding the opening, which has a smooth surface, and depends on the progress of the ulceration. Sometimes the stomach is a little thickened round the opening; and at other times it seems to have the natural structure.

Scirrhus and Cancer of the Stomach.

Scirrhus and Cancer of the Stomach are not very uncommon towards an advanced period of life, and I

think are more frequently met with in men than in women. This may probably depend on the greater intemperance of the one sex than of the other.

Scirrhus sometimes extends over almost the whole of the stomach, but most commonly it attacks one part of it. The part which is affected with scirrhus has sometimes no very distinct limit between it and the sound structure of the stomach, but most commonly the limit is very well marked. When scirrhus attacks a portion of the stomach only, it is generally towards the pylorus. The principal reason of this probably is, that there is more of glandular structure in that part of the stomach than in any other; and it would appear that glandular parts of the body are more liable to be affected with scirrhus than other parts.

When the whole stomach, or a portion of it, is scirrhous, it is much thicker than natural, as well as much harder in its texture. When the diseased part is cut into, the original structure of the stomach is frequently marked with sufficient distinctness, but very much altered from the natural appearance. The peritonæal covering of the stomach is many times thicker than it ought to be, and has almost a gristly hardness. The muscular part is also very much thickened, and is intersected by numerous membranous septa. These membranous septa are, probably, nothing else than the cellular membrane intervening between the fasciculi of the muscular fibres, thickened from the disease. The mucous membrane is also extremely thick and hard, and not unfrequently somewhat tuberculated or irregularly elevated towards the cavity of the stomach.

It frequently happens that this thickened mass is ulcerated on its surface, and then a stomach is said to

be Cancerous. Sometimes the mucous membrane of the stomach throws out a process which terminates in a great many smaller processes, and produces what has commonly been called a fungous appearance.

It also happens, that the stomach at some part loses entirely all vestige of its natural structure, and is changed into a very hard mass, of a whitish colour, with some appearance of membrane intersecting it: or it is converted into a gristly substance, like cartilage somewhat softened. The absorbent glands in the neighbourhood are at the same time commonly enlarged, white, and have a very hard structure.

Circumscribed Scirrhous Tumors in the Stomach.

I HAVE seen several instances of a Scirrhous Tumor formed in the Stomach about the size of a walnut, while every other part was healthy. This tumor has most frequently a small depression near the middle of its surface. While it remains free from irritation, the functions of the stomach are probably very little affected by it; when, however, it is irritated, it must occasion very considerable disorder in the functions of the stomach, and may perhaps lay the foundation of a fatal disease.

Pouch formed in the Stomach.

A PART of the Stomach is occasionally formed into a Pouch by mechanical means, although very rarely. I have seen one instance of a pouch being so formed, in which five halfpence had been lodged. The coats of the stomach were thinner at that part, but were

neither inflamed nor ulcerated. The halfpence had remained there for some considerable time, forming a pouch by their weight, but had not irritated the stomach so as to produce inflammation or ulceration.

Stricture at the Pylorus.

The orifice of the Stomach may be almost, or perhaps entirely, shut up by a permanent Contraction of its muscular fibres, either at the cardia or pylorus. This is likely, however, to occur most frequently at the pylorus, because the fibres at that end of the stomach are more circular in their direction, and possess a stronger contractile power. An obstruction, too, in the canal will be produced by a less contraction at the pylorus than at the cardia. I have seen one instance of this contraction at the pylorus, which, even there, is a very rase disease. The contraction was so great as hardly to admit a common goose-quill to pass from the stomach into the duodenum, and it had prevented a number of plum-stones from passing.

Fungous Tumors Obstructing the Pylorus.

Some instances have occurred of the passage of the Pylorus being obstructed by Fungous Tumors growing from narrow pedicles attached to this part of the stomach. This morbid appearance, however, is very rare, and has not fallen under my own observation.*

Stomach much Contracted, and much Enlarged.

The Stomach is sometimes found so much contracted through its whole extent as not to be larger

* See Portal's Anatomie Médicale, tom. v. p. 205.

than a portion of the small intestine; and sometimes it is enlarged to much more than its ordinary size. Neither of these appearances is to be considered as arising from disease. They depend entirely on the muscular fibres of the stomach being in a state of contraction or relaxation at the time of death. It happens perhaps more frequently that the stomach is dilated than contracted.

Stomach Distended with Air.

The Stomach is, very commonly, in a dead body, flaccid and almost empty; but not unfrequently it is found more or less distended with Air: this air may have been formed after death, but it is often formed during life. When this is the case, we may suppose it to be produced by a chemical decomposition of the contents of the stomach; but it also frequently happens that air is separated from the blood, in the blood-vessels of the stomach, and poured by the exhalents into its cavity. This has been more particularly taken notice of by John Hunter, in his Essay on Digestion*, and by myself, in a paper published in the first volume of the Medical and Chirurgical Transactions.†

Part of the Stomach dissolved by the Gastric Juice.

In looking at the coats of the stomach at its great end, a small portion of them frequently appears to be thinner, more transparent, and feels somewhat more

* See Mr. Hunter's Observations on certain Parts of the Animal Economy, p. 164.

† See case of Emphysema, vol. i.

pulpy than usual; but these appearances are seldom very strongly marked. They arise from the gastric juice resting on that part of the stomach in greater quantity than on any other, and dissolving a small portion of its coats.* This is therefore not to be considered as the consequence of disease, but as a natural effect, depending on the action of the gastric juice, on the coats of the stomach after death. When the gastric juice has been accumulated in considerable quantity, and of an active nature, the stomach has been dissolved quite through its substance at the great end, and its contents have been effused into the general cavity of the abdomen. In such cases the neighbouring viscera are also partially dissolved. The instances, however, of so powerful a solution are rare, and have generally occurred in persons who, while in good health, had died suddenly from accident. If the powers of the stomach were little impaired by diseases, this appearance after death would be very common. As, however, they are very much injured by most diseases, and by many totally destroyed, this appearance very seldom takes place. The true explanation of these appearances was first given by John Hunter, and published in the Philosophical Transactions.†

Fatty Tumors in the Stomach.

Tumors consisting of a fatty substance have been sometimes found in the stomach, but they are to be

* From some ingenious experiments of Dr. Prout, recorded in the Phil. Trans. for 1824, it appears that the Gastric Juice contains a considerable quantity of the Muriatic Acid. (*Ed.*)

† See Philosoph. Transact. vol. lxii. p. 447.

considered as a very rare appearance of disease. Ruysch relates that he has seen a tumor, taken from the stomach of a man, which contained hair, together with some dentes molares.* This preparation may be considered as exhibiting an approach to the formation of a fœtus in the human stomach. Two cases somewhat similar to it, but much more extraordinary, because the developement of the fœtal structure was much more perfect, have within a few years occurred in this country.†

Calculi in the Stomach.

Calculi of different appearances have been described as being occasionally found in the Stomach. They have never come under my own observation, and are to be considered very uncommon.‡ Most of these calculi have been found on examination to be biliary, and had been conveyed from the duodenum into the stomach by an antiperistaltic motion of this part of the small intestines.§

* Vid. Ruysch, tom. ii. Adversar. Anatomicor. Decad. Tert.

† One of these cases was published by Mr. Highmore, Surgeon at Sherborne, in which the fœtus was contained in a cyst, that communicated with the duodenum. The other was published by Mr. Young, in the first volume of the Medico-Chirurgical Transactions. In this instance the fœtus was contained in a cyst, situated between the laminæ of the transverse mesocolon, p. 234.

‡ Vid. Lieutaud, tom. i. p. 17.

§ Dr. Monro has collected a great number of examples of Concretions found in the Stomach, and Intestinal Canal; an account of which is published in his Morbid Anatomy of the Alimentary Canal; which see. (*Ed.*)

Morbid Papillæ in the Stomach.

Papillæ and Pustules, somewhat resembling the small-pox, have also been described as being formed on the mucous membrane of the Stomach, but these are exceedingly rare. *

Small-Pox Pustules in the Stomach.

Even true Small-Pox Pustules have been said to be found in the Stomach of persons who died from this disease.† In later dissections, however, this appearance has not been observed; and I am disposed to believe, where it had been thought to exist, that some mistake had been made.

SYMPTOMS.

In Inflammation of the Stomach, the following Symptoms are observed to take place: pain in the epigastric region, which is increased when any thing has been swallowed, vomiting, often hickup, symptomatic fever, with a small, frequent, and hard pulse, and a feeling of great debility.

When a person has been Poisoned by Arsenic, the following Symptoms have commonly been observed: vomiting, great thirst, a burning feeling in the stomach, severe griping pains, purging of a watery or viscid matter, sometimes of blood, a sense of coldness, especially in the extremities, a cold sweat, occasionally paleness of the countenance; the countenance often

* Vid. Lieutaud, tom. i. p. 23. † Ibid. p. 371.

swelled and flushed; often faintness and languor; sometimes convulsions; palpitation of the heart; and sometimes vertigo.*

Hydrophobia is sufficiently characterised by the horror which the patient expresses at the sight of any fluid that is offered to him; by the great difficulty experienced in swallowing, and by the strong alienation of mind which often accompanies this dreadful disease.

I have reason to believe that Ulcers of the Stomach are often slow in their progress. They are attended with pain, or an uneasy feeling in the stomach, and what is swallowed is frequently rejected by vomiting. Pus and blood are likewise occasionally thrown up by vomiting.

Cancer of the Stomach is attended with a sense of pain in that organ, which varies a good deal in its degree in different individuals. What is swallowed is commonly, but not always, rejected by vomiting, and there is frequently thrown up a dark-coloured fluid, which has generally been compared, in appearance, to coffee-grounds. The patient becomes at length emaciated, and the countenance sallow: the pulse at the beginning of this dreadful complaint is natural, but towards its close it is frequent, and accompanied with the usual symptoms of hectic fever. Where the person is much emaciated, and the cancerous swelling is situated near the pylorus, or along a part of the great

* See a very accurate account of the symptoms produced by swallowing Arsenic, in a Treatise on this subject, published by Mr. Marshall.

curvature of the stomach, it may be felt in the living body, if its bulk be considerable, by a careful examination with the hand.

The accumulation of Air in the Stomach is accompanied with an unpleasant feeling of distention, and a swelling may be felt externally in the epigastric region; wind passes up the œsophagus, and there are occasional pains in the stomach, produced by a spasmodic contraction of some part of its muscular coat.

CHAP. VIII.

DISEASED APPEARANCES OF THE INTESTINES.

Inflammation of the Intestines.

THE Intestinal Canal is subject to Inflammation from a variety of causes, and therefore we have frequent opportunities of observing its effects after death. When a portion of intestine is inflamed, there is spread on its outer surface a number of small vessels, many of which contain florid blood. When the intestine is cut into, so as to exhibit its mucous membrane, this appears highly vascular from the small vessels of the villi being loaded with blood, and a few spots of extravasated blood are frequently to be seen in it. In inflammation of the intestines, the peritonæum is often very little, or not at all affected. When, however, the inflammation is very great, the peritonæum is also inflamed, and covered with a layer of coagulable lymph. I have likewise seen, in violent inflammation, scattered portions of coagulable lymph thrown out upon the surface of the mucous membrane; this, however, is very uncommon. The intestine is at the same time much more thick and massy than in a healthy state, and its colour is sometimes very dark, from a large quantity of black extravasated blood. This state of the intestine has often been mistaken for mortification.

It very commonly happens that inflammation of the intestines advances to suppuration and ulceration.

This takes place where the inflammation is confined principally to the mucous membrane of the intestines. The ulcer is formed on the mucous surface; and I do not recollect to have seen one instance where the ulcer had begun on the peritonæal surface of the intestines and had spread inwards. Ulceration, however, does not appear to be so common in the small as in the great intestines. When it takes place either in the one or the other intestine, it is attended with considerable variety in its appearance. The edges of the ulcer have sometimes considerable thickness, and sometimes they are not thicker than the healthy structure of the intestine. The edges and general cavity of the ulcer are sometimes ragged and at other times they are smooth, as if a portion had been cut out from the intestine with a knife. Sometimes through a considerable length of intestine, especially if it be the great one, the inner membrane hangs in shreds, occasioned by the great ravage of the ulceration. I have also seen a considerable portion of intestine completely stripped of its mucous membrane, from the extent of this process, and its muscular coat appeared as distinct as if the mucous membrane had been very carefully dissected off. In the follicular glands, which are gathered together in little oval groups, I think ulceration occurs more frequently than in the other textures of the intestine.

When ulceration advances very actively, it sometimes erodes the coats of the intestine entirely. When this is the case, a portion of the contents of the intestine occasionally passes into the general cavity of the abdomen, producing inflammation. This, however, does not very often happen; most commonly that portion

of the gut where the ulcer is situated adheres by inflammation to some other portion, or to a neighbouring viscus, and a communication is formed between the one and the other. I have seen communications formed in this manner between the rectum and the bladder in a male, and between the rectum and the vagina in a female. I have even seen a communication formed between the kidney and a portion of the intestine from this cause, so that the pus produced in the kidney was evacuated through the intestine. Such communications are the means of preserving life, although in a very uncomfortable state, for a much longer period than it could be, were the pus to pass into the general cavity of the belly. It would there produce peritonæal inflammation, which would soon prove fatal. The mucous membrane of the intestines is more disposed to become ulcerated, than the mucous membrane of any other canal. Thus ulcers are very rare in the mucous membrane of the trachea or the urethra, but very common in the mucous membrane both of the great and of the small intestines. It is difficult to assign a satisfactory reason for this difference. It probably, however, depends upon the different structures and functions of these parts. There is a good deal of resemblance between the structure of the mucous membrane of the trachea and that of the urethra. The secretion of the one, likewise, is not very different from that of the other. The mucous membrane of the intestines has a structure and secretion peculiar to itself. It is probable that on these circumstances depends its greater disposition to ulcerate; but it is very difficult to explain how this should be the case.

Inflammation of the Intestines sometimes, although rarely, advances to Mortification. When this is the case, the mortified part is of a dark livid colour, and has lost its tenacity; it is in this state very easily torn, or the fingers may be passed through it as through a rotten pear. The want of the natural tenacity, when attended with the change of colour which has been mentioned, is the only sure criterion of a part being mortified in examinations after death. A portion of intestine may be of a very dark colour, and yet may not be mortified. This darkness of colour may be occasioned by a large quantity of blood extravasated during a high degree of inflammation, where the principle of life is maintained in full vigour. Thus, we see blood effused into the cellular membrane under the skin, producing a very dark appearance, yet the parts are quite alive. It has often happened, too, that a very dark portion of intestine has been returned in the operation for hernia, and yet the parts have recovered their natural functions. This could never have happened if the black portion of the intestine had really been mortified. Under such circumstances, the mortified part would have separated from the living, and the function of the gut must have been destroyed. When a portion of gut has been for some time mortified, a considerable quantity of air is formed, which is accumulated in its cavity. This is a part of the natural process which takes place in all dead animal substances. I have known an instance where a large portion, upwards of a yard, of the great intestine had lost its living principle, and was expelled through the anus. The person lived about three weeks afterwards.*

* See Vol. II.

Intus-Susceptio.

INTUS-SUSCEPTIO is not a very uncommon disease, and is frequently fatal. It consists in a portion of gut passing for some length within another portion, and dragging along with it a part of the mesentery. The portion of gut which is received into the other is in a contracted state, and is sometimes of considerable length. It usually happens that an upper portion of intestine falls into a lower; but the contrary likewise occurs, although rarely. Intus-susceptio may take place in any part of the intestinal canal, but it happens most frequently in the small intestines, and where the ileum terminates in the colon: this, perhaps, depends on the great difference in size between these two portions of intestine. In opening bodies, particularly of infants, an intus-susceptio is not unfrequently found, which had been attended during life with no mischief: the parts appear perfectly free from inflammation, and they would probably have been easily disentangled from each other by their natural peristaltic motion. At other times, however, so large a portion of the gut passes within another portion of it that it cannot be disentangled, and the passage of the intestines is obstructed, without any possibility of its being set free. This is the fatal state of the disease, and is sometimes attended with inflammation.

Ruptures.

A PORTION of the viscera of the abdomen frequently passes out of that cavity, being lodged in a bag formed by elongated peritonæum; and this disease is called a

Rupture. It happens most commonly from some sudden and violent concussion of the body, where the weaker parts of the parietes of the abdomen give way. I once thought, and it is, I believe, the general opinion, that ruptures occur more frequently in fat than in lean people; but from some conversation which I have had with persons who have paid particular attention to this disease, I am disposed to think that this opinion is ill founded. Ruptures are as frequent in persons who are not corpulent, as in those who are.*

There is hardly any viscus which has not, at some time or other, been found in the Sac of a Rupture; but most frequently it is either a portion of the omentum, or of the intestines, or of both. The bag formed by the peritonæum may be thrust out almost at any part of the abdomen; but this happens most frequently at the ring of the external oblique muscle, under Poupart's ligament, and at the umbilicus: it also sometimes takes place at other parts of the abdomen. There is another situation where a rupture has been known to happen, although very rarely, viz. through an opening in the diaphragm into the thorax. The opinion which would most obviously be formed about this is, that a portion of the diaphragm had burst, and a part of the intestines had protruded into the opening made in the diaphragm. I am persuaded, however, that this opinion will almost always be ill founded. It happens, sometimes, but very seldom, that children are born with an aperture in the diaphragm, which is a malformation of this part of the body. When the opening

* The umbilical rupture should be considered as an exception to this remark, for it is much more common in fat people than in those of a spare habit.

is large, a considerable portion of the abdominal viscera passes into the thorax, and so impedes the functions of the heart and lungs, that children under these circumstances perish immediately after birth. When the opening in the diaphragm is small, it lays the foundation of the hernia or rupture just described, and which may be called the Diaphragmatic Hernia.*

It is well known that the most usual situation of a rupture in the male is at the ring of the external oblique muscle; and this arises, probably, from the larger size of that opening in the male than in the female. The most usual situation of a rupture in the female is also known to be either under Poupart's ligament, or at the umbilicus. The reason of its frequency in the first situation is the particular shape of the pelvis in the female, by which there is a larger empty space under Poupart's ligament, than in the male, so that the viscera at that part are less firmly supported. The reason why the second situation of a rupture occurs often in the female, is, probably, frequent child-bearing. During pregnancy, at its advanced period, the umbilicus opens, or gives way, and where pregnancies have been frequent, it probably never recovers its original strength.

The omentum is more commonly found in the sac of a rupture than any of the viscera. This perhaps arises from its being a loose mass, not tied down to any particular situation; and therefore it readily passes into any cavity which commuicates with

* A case of this kind occurred to Dr. Clarke, and is published in the 2d volume of the Medical and Chirurgical Transactions, p. 118. He was so obliging as to give me the preparation which illustrates this hernia.

the abdomen. When it has once fallen down, it has no means of pulling itself out, like a portion of intestine, which is another reason why it is so often found in a rupture. When it has remained long in a sac, it forms a pretty compact mass, sometimes having no connection with, but at other times adhering to, the inner surface of the sac. There is frequently no inflammation produced in the omentum while in this situation; but occasionally violent inflammation takes place, which may even advance to mortification.

A portion of gut is very often lodged in the sac of a rupture, either by itself, or along with a portion of the omentum. The portion of gut is sometimes very small, but sometimes it is considerable. Very often the functions of the intestines go on properly in this situation, but occasionally violent inflammation is produced, interrupting their function, and often terminating fatally. This inflammation is produced by the gut being strongly pressed at the narrowest part of the sac, viz. at that part where the sac immediately passes out of the cavity of the abdomen. This inflammation exhibits the different appearances, on dissection, which have so often been related. The gut, too, is frequently found mortified: this is marked by its dark colour, by its want of proper tenacity, and by the air which is formed within it.* When the inflammation of the gut in a hernial sac has not been very violent, and has terminated by resolution, it frequently leaves adhesions behind it, connecting the gut with the inner surface of the sac. It is perhaps pos-

* Sometimes the strangulated portion of gut mortifies, which may either be the whole diameter of the canal or only a portion of it. Thence is formed an artificial anus. (*Ed.*)

sible, too, that adhesions may be formed by a long and close contact, without inflammation.

When the sac of a rupture has not been of long duration, it consists of a thin, firm, white, opaque membrane; this is a protruded part of the peritonæum, somewhat thickened by pressure. * When the sac has been of long duration it is often very thick, and evidently consists of a number of layers. The sac on the inside has a very smooth surface, and the membrane which forms this surface can be readily traced into the peritonæum, lining the cavity of the abdomen; the outer surface of the sac is more rough and course in its texture. The sac, where it passes out of the cavity of the abdomen, has frequently a narrow neck, or aperture, and is distended below into a bag of considerable size. At other times, the communication between the sac and the cavity of the abdomen is by a larger opening.

Hernia Congenita.

In bubonocele the sac is usually quite distinct from the sac of the tunica vaginalis testis. Sometimes, however, there is no separation between them, and the contents of the rupture are immediately in contact with the body of the testicle: this kind of rupture is called the Hernia Congenita. It was formerly supposed to arise from a portion of the sac of the rupture and of the tunica vaginalis having given

* In some cases of umbilical hernia, Dr. Marshall observed no distinct appearance of peritonæal sac. This must have arisen from the peritonæum having burst, in consequence of distention, and its ruptured edges being lost by adhesion in the neighbouring parts.

way; so that the contents of the rupture fell into the cavity of the tunica vaginalis testis, and came in contact with the testicle. On a little reflection, it might have been perceived that this could hardly take place; though the true cause of this appearance was not known till it was explained by William Hunter. Haller discovered, that till about the eighth month the testicles do not descend into the scrotum, but are situated in the cavity of the abdomen under the kidneys. When they descend into the scrotum, the peritonæum that covers them is necessarily drawn down along with them through the ring of the external oblique muscle: the peritonæum then forms a bag, the upper extremity of which communicates with the cavity of the abdomen. Haller also observed, that in infants a portion of intestine sometimes falls down into this bag after the testicle, or along with it, producing what he called the hernia congenita. The communication between the bag and the abdomen is commonly closed, sometimes a little before, and sometimes soon after birth. It appears, however, that if it be prevented from closing at the usual time, it does not coalesce afterwards, but remains open through life. Hence, if any portion of intestine, or omentum, falls into the elongated sac of the peritonæum, it must be in contact with the testicle. When William Hunter became acquainted with the observations of Haller upon the descent of the testicles, he saw that the species of rupture, sometimes to be met with in adults, where a portion of intestine, or omentum, is in contact with the testicle, might be easily explained. His explanation corresponded with that just given, and has been universally admitted.

Scirrhus and Cancer of the Intestines.

Scirrhus is a disease which takes place much more commonly in the great than in the small Intestines, but the latter are occasionally affected by it. I have seen a scirrhous tumor and a cancerous ulcer in the duodenum. In the great intestines, at an advanced period of life, scirrhus is not uncommon : every portion of this intestine is not equally liable to be affected by it, but it is to be found much more frequently at the sigmoid flexure of the colon, or in the rectum, than any where else, which perhaps may depend on the following circumstances: There is certainly more of glandular structure in the inner membrane of the great intestines towards its lower extremity, than in any other part of it ; and this kind of structure has a greater tendency to be affected with scirrhus, than the ordinary structures of the body : the gut, too, is narrower at the sigmoid flexure than at any other part, and therefore will be more liable to be injured by the passage of hard bodies ; which, by their irritation, may excite scirrhus in a part that was predisposed to it.

The scirrhus sometimes extends over a considerable length of the gut, viz. several inches ; but generally it is more circumscribed. It exhibits the same appearances of structure which were described when speaking of scirrhus of the stomach. The peritonæal, muscular, and internal coats are much thicker and harder than in a natural state. The muscular coat is also subdivided by membranous septa, and the internal coat is sometimes formed into hard irregular folds. It often happens that the surface of the mucous membrane is ulcerated, producing Cancer. Every vestige of the natural

structure is occasionally lost, and the gut appears changed into a gristly substance. When scirrhus affects the gut, the passage at that part is always narrowed, and sometimes so much so, as to be almost entirely obstructed. The obliteration, or stricture, would sometimes appear to be greater than in proportion to the thickness of the sides of the diseased gut; this most probably depends on the contraction of the muscular fibres of the gut, which, although diseased, have not altogether lost their natural action. Where the passage is very much obstructed, the gut is much enlarged immediately above the obstruction, from the accumulation of the contents in that part of the intestine. While this disease is going on in a portion of the intestine, adhesions are formed between it and the neighbouring viscera, and the ulceration sometimes spreads from the one to the other.

The diseased Change of the Intestines in Dysentery.

The Mucous Membrane of the Great Intestines I have seen a good deal thickened, and formed into small irregular tubercles, some of which were of a white, and others of a yellowish colour; the peritonæal and muscular coats were also thicker and harder than in a natural state, and the diameter of the intestine was a good deal contracted. In some places, too, the mucous membrane appeared abraded, and the tubercles were sometimes fissured upon the surface, so as somewhat to resemble common warts. This is not a frequent appearance of disease, but it has generally been found to take place in very severe dysenteries, such as those which occasionally arise in camps. In the com-

mon cases of dysentery, which take place during the autumnal season in this country, the morbid appearances just described are not commonly found; at least no such instance has fallen under my observation. When such cases prove fatal, a number of ulcers are discovered by examination after death, in the mucous membrane of the great and sometimes of the small intestines.

Thickened Folds of the Mucous Membrane of the Great Intestines.

I HAVE also seen the Mucous Membrane of the Great Intestines formed into broad thick Folds, in which a considerable quantity of blood was accumulated: these folds were perfectly independent of the state of contraction in the muscular coat, and were very different in their appearance from the irregular puckering which is often seen in the mucous membrane of the great intestines. When these folds were examined, they were found to consist of an accumulation of cellular membrane, with the mucous coat of the gut reflected over it.

On the inner surface of the great intestine, about two inches above the anus, little processes sometimes grow from the internal membrane: they generally surround the gut at short distances from each other, so as to form a sort of circle.

Polypi of the Intestines.

POLYPI are occasionally formed in the great intestines, but this morbid appearance is not frequent.

They take place chiefly in the lower part of the rectum, but they are sometimes found as high up as the sigmoid flexure of the colon. They grow from the mucous surface of the intestine by a narrow neck or pedicle, and fill up, according to their size, more or less of its cavity. I met with one instance of a Polypus nearly as large as the fist, which grew in the Sigmoid Flexure of the Colon, and there formed a fatal cause of obstruction. When a polypus is situated very low down in the rectum, and more especially if it be not large, it may be removed by a ligature, and the passage of the intestine may become as free as before the growth of the polypus.

A Milt-like Tumor growing from the Mucous Membrane of the Intestines.

Professor Monro has described a tumor growing from the mucous membrane of the intestines, of a very peculiar kind, which he has called the Milt-like Tumor. It is of very rare occurrence, and resembles a good deal in its consistence and appearance the milt of many fishes. It grows by a number of small processes from the mucous membrane, and has a remarkably offensive fætor. I have never seen any instance of this tumor.*

Piles.

Piles and fistulæ in ano are diseases which are extremely common, but very seldom become an object of examination after death; they have therefore not been

* See Professor Monro's Morbid Anatomy of the Human Gullet, Stomach, and Intestines, 1813.

so frequently introduced into accounts of morbid appearances as others which much more rarely occur. Piles are soft tumors commonly situated round the verge of the anus, sometimes of a regularly bulbous, and sometimes of an irregular form. They are covered with a very tender skin, which partly consists of the fine skin immediately round the anus on the outside, and partly of the mucous membrane of the gut. The tumors are generally entire, but they have occasionally small openings, through which a considerable quantity of blood is sometimes poured: they consist commonly of the veins round the verge of the anus, much enlarged from the accumulation of blood. These veins are branches of the internal iliac vein, but they communicate largely with the lower branches of the mesaraica minor.

The same sort of tumors are also frequently found within the cavity of the rectum, forming what have been called the internal piles; and these are occasioned by the enlargement of some of the branches of the mesaraica minor. Piles are a much more frequent disease in persons who are advanced in life, than in those who are young. They arise from repeated, and long-continued impediments to the return of the blood from the lower part of the rectum, and there are many more opportunities for these impediments to act in old than in young persons. They are also more common in women than in men. This may arise from several causes: the uterus during pregnancy must occasion a great impediment to the return of the blood from the rectum: this is so much the case, that women who have frequently been pregnant seldom escape piles. Women, too, are more apt to allow of an accumulation

of the proper contents of the rectum, than men, which will produce some impediment to the return of the blood from this part.

Fistulæ in Ano.

Fistulæ in Ano are narrow canals, formed by suppuration in the loose cellular membrane at the lower end of the rectum, and are distinguished by the following circumstances: they have callous edges, a smooth internal surface, and possess the power of secreting pus.* A disease of this sort may consist of one canal, opening by a very small aperture externally, at the side of the anus; or this canal may be divided into several branches. The canal, besides opening externally, has very commonly a small opening into the gut itself; and sometimes there is a small opening into the gut, without there being any externally on the side of the anus. It is much more common, however, to find only an external opening of the canal; or, to find both an external opening, and another into the gut.

A Cul-de-sac in the Intestines. (Ed.)

A Cul-de-sac has been found in various parts of the Intestinal canal. These commonly resemble the appendix vermiformis, but they are usually shorter and larger in diameter. In one remarkable instance I found a cul-de-sac had passed into a hernial sac, and which by strangulation was ultimately separated from the alimentary canal, and had no communication with it.

* John Hunter observed, in his Lectures on Surgery, that Fistulæ have a smooth internal surface, like a secreting surface, as, for instance, that of the urethra.

The Rectum terminating in a Cul-de-sac.

It is a species of malformation not very uncommon, that the Rectum does not terminate in the anus, but in a Cul-de-sac, without reaching the external surface. Sometimes the extremity of the gut lies near the external surface, but more commonly it is at some distance from it. In such cases there is usually the appearance of an anus, but the opening is more contracted than in the natural structure. It seldom happens that this malformation can be effectually remedied by a surgical operation. An opening made into the extremity of the gut has generally such a disposition to close, that the benefit which might naturally be expected from an operation is frustrated. A few cases, however, have occurred, in which the operation has been successful.

The Rectum terminating in the Bladder.

I have also seen the Rectum terminate in the Bladder, from malformation, so that there was no other external opening to the rectum than by the urethra. This was in a child at birth, and the malformation was of such a kind, as neither to admit of a remedy by art, nor to allow of life being continued.

The rectum has also been known to terminate in the vagina, from a defect in the original formation; but this is very uncommon.

Worms.

Worms are formed in the Intestines of Man, as well as in those of many other animals; but not so

frequently in the former as in the latter. In most quadrupeds and fishes, it is extremely common to find a number of worms on opening their intestines.

The worms which are found in the human subject may be reduced to three classes, viz. the Lumbricus Teres; the Tænia; and the Ascaris.

Lumbricus Teres.

The Lumbricus Teres, or round worm, is much more frequently found in the intestines of children, than in those of persons full grown, or advanced in life: it is very usually met with in the first, but rarely in the two last. The lumbricus teres is well known to differ from the common earth-worm, but many practitioners in this country have made little enquiry into the circumstances upon which this difference depends. The two species of worms, if attentively examined, will be found to differ a good deal from each other in their external appearance. The lumbricus teres is more pointed at both extremities than the common earth-worm. The mouth of the lumbricus teres consists of three rounded projections, with an intermediate cavity; the mouth of the earth-worm consists of a small longitudinal fissure, situated on the under surface of a small rounded head. Upon the under surface, too, of this worm, there is a large semi-lunar fold of skin, into which the head retreats, or out of which it is elongated, but this is entirely wanting in the lumbricus teres. The anus of the lumbricus teres opens upon the under surface of the worm a little way from its posterior extremity, by a transverse curved fissure; the anus of the earth-worm opens by an oval aperture at the very

extremity of the worm. The outer covering or skin in the lumbricus teres is less fleshy, and less strongly marked by transverse rugæ, than in the earth-worm. In the latter there is often to be seen a broad yellowish band, surrounding the body; but in the lumbricus teres this is entirely wanting. On each side of the lumbricus teres there is a longitudinal line very well marked; in the earth-worm there are three longitudinal lines on the upper half of its surface, but these are so faintly defined, as to be hardly observable. The lumbricus teres has nothing corresponding to feet; whereas the earth-worm has on its under surface, more strongly marked towards its posterior extremity, a quadruple row of processes on each side, very sensible both to the eye and to the finger; manifestly serving the purposes of feet in the locomotion of the animal.

The internal structure of these two species of Worms is also extremely different. In the lumbricus teres there is an intestinal canal, nearly uniform and smooth in its appearance, which passes from one extremity of the worm to the other. Near the head of this worm, the canal is narrower than it is any where else, and somewhat distinct in its limits: this part may be considered as the œsophagus. In the earth-worm there is a large and complex stomach, consisting of two cavities; the intestinal canal is likewise larger, and more formed into sacculi. The parts of generation in these two species of worms differ very much from each other; in the lumbricus teres there is a distinction of sex, the parts of generation being different in the male and in the female; in the common earth-worm the organs of generation are the same in each

individual, as this worm is hermaphrodite. The appearance, too, of the organs of generation is extremely different in the one species of animal and in the other. There is an oval mass situated at the anterior extremity of the earth-worm, resembling a good deal the medullary matter of the brain; in the lumbricus teres this substance is wanting.* These are the principal and obvious differences between the one species of animal and the other.

Tænia.

The Tænia which is most commonly found in the human intestines is of two kinds, viz. the tænia solium, and the tænia lata.

Tænia Solium.

The Tænia Solium is frequently generated in the intestines of the inhabitants of Germany, and occasionally, but rarely, in those of the inhabitants of Great Britain. It consists of a great many distinct portions, which are connected together so as to put on a jointed appearance; these joints are commonly of a very white colour, but more occasionally brownish, which depends on a brownish fluid found in their vessels. The worm is usually very long, extending often many yards; and it seldom passes entire from the bowels. This circumstance has prevented the extremities of the tænia from being often seen.

The head of this tænia is somewhat of a square

* What this substance is I do not know, and I have only mentioned its resemblance to the medullary matter of the brain, in order to give a clearer description of it.

form, with a narrowed projection forwards: in the middle of this projecting part there is a distinct circular aperture, around the edge of which grow curved sharp processes. Near the angles of the square edge of the head are situated four round projecting apertures, at equal distances from each other: this head is placed upon a narrow jointed portion of the worm, of considerable length, which gradually spreads itself into the broader joints of which the body of the worm is composed.

The body of the tænia consists of thin, flat, pretty long joints, on one edge of which there is a projection, with a very distinct aperture. In the same worm some of these joints appear considerably longer than others, which probably depends on one joint being contracted while another is relaxed. The apertures just mentioned are generally placed on the opposite edges of the contiguous joints; but this is not uniformly the case. They are sometimes placed on the same edges of two, or even several contiguous joints. When these joints are attentively examined, there are frequently seen, in each of them, vessels filled with a brownish fluid, disposed in an arborescent form. Around the edges of each joint there is also a distinct serpentine canal.* The last joint of a tænia resembles very much a common joint, rounded off at its extremity, and without any aperture.

* This, as well as the vessels disposed in an arborescent form, is very distinctly seen injected in some preparations which were made, and given to me by an ingenious Surgeon, Mr. Carlisle.

Tænia Lata.

The Tænia Lata is generated very commonly in the intestines of the inhabitants of Switzerland, but very rarely in those of the inhabitants of Great Britain. The joints of which it is composed are short and broad, and the aperture is not on the edge of each joint, as in the solium, but in the middle of its flattened surface. Round these apertures are short radiated vessels. The head is of an oval shape, and so small that its minute structure is not visible to the naked eye. Its tail terminates in two narrow processes, one of which is longer than the other.

Other tænia have occasionally been found in the human intestines, but they occur very rarely, and have not fallen under my observation.

Ascaris.

The Ascaris is a very small worm, which is often found at the lower end of the rectum in children, and even more frequently in adults than is commonly imagined. It is white in its colour, and about half an inch in length: at the extremity where its head is placed, it is a little narrowed, and at the other extremity it terminates in a long, very fine, transparent process. These worms are more or less surrounded with mucus, which is secreted in an increased quantity by the glands of the mucous membrane of the rectum, from the irritation occasioned by the worms.

Trichuris.

The Trichuris has occasionally been found in the great intestines of man, and more especially in the

cœcum. It resembles a good deal the ascaris, but is considerably larger, and has a very long transparent tail. To their heads is attached a process or horn, which they can protrude or retract.

There is nothing in the economy of animals more obscure than the origin of intestinal worms: were they found to live out of the bodies of living animals, one might readily suppose that their ovula were taken into the body along with the food and drink, and there gradually evolved into animals. This, however, is not the case: they do not seem capable of living for a length of time in any situation, except within a living animal body, which appears to be the proper place for their origin, growth, and residence. We might therefore be led to another supposition, viz. that intestinal worms are really formed from the matter contained in the intestines, which previously had no regular organisation; but this idea is widely different from all analogy in the production of animals, where there has been any satisfactory opportunity of examining this production. The origin, therefore, of such animals is a subject of much obscurity, and probably will not soon have any satisfactory light thrown upon it.

Air accumulated in the Intestines.

It is not unusual to find Air accumulated in the intestinal canal, in a greater or less quantity; and this air is sometimes, but not constantly, accompanied with a slight inflammation of the peritonæum. In such cases the blood-vessels of the intestines are sometimes filled with air. Air is often generated in the intestines

by putrefaction after death; but that which is particularly considered here has been formed during life.

There are only two ways in which air can well be conceived to be formed in the intestines: the one is, by some chemical change in the contents of the intestines; the other is, by its formation in the blood-vessels of the intestines, and which air is afterwards poured out by the extremities of the exhalent arteries into the cavity of the intestines. That the blood-vessels have this power there can be no doubt; and I own I am inclined to think that this is a mode by which air is not unfrequently accumulated in the intestines. This air probably differs somewhat at different times: in several trials which I have made, it never contained any inflammable air, but always a very sensible proportion of fixed air. It requires, however, to be examined by some person well acquainted with chemical experiments, in order that its ingredients may be exactly ascertained.

Bony Matter formed in the Intestines.

These are the most common appearances of diseased or pretenatural structure in the intestines; but I have likewise had an opportunity of observing others, which are of rare occurrence. In one or two instances, I have seen a kind of bony matter formed upon the surface of the mucous membrane of the gut: I have even seen an adhesion between two portions of intestine converted into bone. It would appear that almost every part of the body is occasionally subject to this process. It may not improperly be considered as a natural process misplaced. An adhesion being once

formed, has the same power (as far as we know) of running into different processes, as the cellular membrane, which makes a part of the original structure. It may therefore form bone, as readily as cellular membrane, or some other membranes of the body, which have a resemblance to the membrane of adhesions, as the pleura, and the peritonæum.

Projecting Ring formed in the Cavity of the Jejunum.

I HAVE seen one of the valvulæ conniventes much larger than usual, and passing round on the inside of the jejunum, like a broad ring. The canal of the gut was necessarily much narrowed at this ring, but no mischief had arisen from it. This malformation, however, might have laid the foundation of fatal mischief. Some substance too large to pass might have rested on the ring, and there produced inflammation, ulceration, and ultimately death.

Concretions in the Intestines.

CONCRETIONS have occasionally been found in some part of the cavity of the intestinal canal, especially in the great intestine; but I have not met with any instance of this kind, in the very numerous examinations of dead bodies which I have made. It may therefore be considered as a rare occurrence. A great many specimens of these concretions have been collected by Professor Monro, and a clear account of them has been given by his son. They are lamellated in their texture, of a colour between yellowish brown and chestnut brown, contain generally a nucleus in their

centre, and are often of a large size. They consist chiefly of phosphate of lime, a matter a good deal resembling vegetable extractive, and a peculiar substance, which is of small specific gravity, and has an appearance a good deal like that of cork.*

Small-Pox Pustules in the Intestines.

SMALL-POX Pustules have been said to be sometimes found in the Intestines of persons who had died from this disease.† How far this may have occasionally taken place, I will not pretend to say; but late dissections, on the best authority, have not confirmed this opinion.

Extraneous Bodies found in the Appendix Vermiformis causing Death. (Ed.)

A GENTLEMAN swallowed a bean, and twenty-four hours afterwards peritonitis came on, which proved fatal in three days. The bean was found lodged in the Appendix Vermiformis.

A child swallowed a small plum-stone, peritonitis supervened, and the stone was also discovered after death in the Appendix Vermiformis.

Diseased Appearances of the Mesentery — Mesentery inflamed.

THE Mesentery is often found in a state of Inflammation; although I believe this hardly ever takes place,

* See Dr. Monro's Morbid Anatomy of the Human Gullet, Stomach, and Intestines.

† Vid. Lieutaud, tom. i. p. 371.

unless when the peritonæum generally is inflamed. When the mesentery is inflamed, it becomes much thicker and more massy than in its natural state; the large blood vessels which pass between its laminæ and the absorbent glands are also very much obscured. These different appearances depend on the quantity of coagulable lymph which is poured out, during the inflammatory action. The peritonæum, which forms the laminæ of the mesentery, is crowded with small blood-vessels, and is covered more or less with a layer of coagulable lymph. A small quantity of pus is sometimes found on the surface of the inflamed mesentery, and even abscesses have been observed between its laminæ; but these are very rare.

It very seldom happens, that the mesentery is found to be gangrenous, unless different portions of the intestinal canal be in the same state. When the intestines are mortified, portions of the mesentery are sometimes found in the same state. The appearances exhibited in mortification are the same in the mesentery as in any other part, and they have been already described.

Scrofula of the Mesenteric Glands.

The Absorbent Glands of the Mesentery are frequently found to be scrofulous; and this is more apt to take place in children, than in persons of a more advanced age. When affected with this disease, the glands exhibit different appearances, according to its progress: they are enlarged, and are often somewhat softer to the touch than in a natural state. When cut into, they sometimes show very much the natural structure; but more frequently they are

changed, in part, into a white, soft, curdy matter; and this is not uncommonly mixed with pus.

Cancer of the Mesenteric Glands.

When a portion of the intestinal canal becomes Cancerous, some of the Absorbent Glands in the Mesentery generally become affected with the same disease: this is in consequence of the matter of cancer being conveyed to those glands by absorbent vessels. The glands become enlarged, and are changed into hard masses, exhibiting a scirrhous, or cancerous structure.

Fungus Hæmatodes of the Mesenteric Glands. (Ed.)

In one case I found the Mesenteric Glands with their vessels very much enlarged, and converted into a soft medullary pulp, the patient having died of a large Hæmatoidal Tumor on the thigh.

Mesenteric Glands Earthy, or Bony.

The Absorbent Glands of the Mesentery are sometimes filled with an earthy, or a bony matter; but this is to be considered as a rare occurrence.* The absorbent glands at the root of the lungs, are more liable to such an affection.

Hydatids have also been occasionally found adhering to the Mesentery.

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* Vide Med. Transactions, vol. i. p. 361.

Tumors, likewise, consisting of a fatty matter, have been seen attached to the Mesentery; but these I believe to be very uncommon.

SYMPTOMS.

INFLAMMATION of the Intestines is characterised by the following Symptoms; viz. an acute and unremitting pain in the abdomen, vomiting, obstinate costiveness, symptomatic fever, with a frequent, small, and hard pulse. The pulse, however, is sometimes less affected than might have been supposed from the violence of the inflammation.

The Symptoms attending Intus-susceptio are similar to those which belong to inflammation of the intestines, and indeed this disease is not unfrequently accompanied with inflammation. It is however more likely to prove fatal than simple inflammation of the bowels, as it does not admit of any substantial benefit from medicine.

When there is a Rupture without any strangulation of the intestine, the following Symptoms take place; viz. a pale swelling at the part affected, a slight pain occasionally felt in the swelling itself, and spread somewhat over the region of the belly, the swelling pushed out by coughing, a disappearance of the swelling on pressure, or on the person continuing for a considerable length of time in a horizontal posture. When a hernia is large and of long standing, it will often be incapable of being reduced by pressure, even when there is no strangulation.

When strangulation takes place, the same symptoms arise which belong to inflammation of the bowels; for the strangulation produces inflammation. These consist of a pain in the swelling, which is diffused over the abdomen, sickness, vomiting, obstinate costiveness, heat, commonly a frequent, small, and a hard pulse: and towards the fatal termination of the disease, there is hickup, with vomiting of a fœtid yellow matter. The sickness I have heard described, as being infinitely more distressing than the ordinary sickness of a deranged stomach; the pulse is sometimes, in such a case, not increased in frequency beyond the standard of health; and yet the inflammation of the bowel has been discovered afterwards, by the operation, to be very great. This is an important practical observation, because it shows that the degree of inflammation is not to be judged of from the pulse, and teaches that the operation should not be delayed, after the proper efforts for reducing the rupture have failed, because the pulse may happen to be little or not at all accelerated.

When a considerable quantity of Pus is formed in consequence of an Ulcer in the Bowels, it is known by pus being evacuated by stool, which is frequently a little tinged with blood. Severe pains are frequently felt in the bowels; and there is a propensity to go often to stool. The pulse is often at first not more frequent than in health, but is afterwards a good deal accelerated. The appetite for food is commonly not much impaired.

When the Great Intestine is attacked with Scirrhus,

the disease has commonly made some progress before it is much attended to by the patient. At first there is but little pain in the part affected, and the patient only observes that he is costive, or that the stools pass with some difficulty. When the disease is more advanced, a considerable pain is felt, more especially in passing a stool, and there are occasional sympathetic pains about the os sacrum and hips. When the stools are examined, they are commonly found to be narrow, to be more or less flattened, often in some degree serpentine; and they are sometimes besmeared with mucus, pus, and blood. The pulse at the beginning of this disease is natural, but towards its close becomes accelerated. In advanced stages of the disease, the countenance is sallow, the strength is much impaired, the body much emaciated, and the constitution at length altogether sinks.

When the Ulcer of the Rectum has spread to the bladder, it is known by air often escaping along with the urine, and by the urine being sometimes more or less mixed with fæces. Severe pain is occasionally felt in the lower part of the belly. The pulse is sometimes accelerated, and sometimes not more frequent than in health.

In Dysentery, griping pains are felt in the abdomen, which often increase to a considerable degree of severity. The bowels are irritated to frequent evacuation, and generally discharge mucus tinged with blood; sometimes white lumps, membranous films, pus, and at intervals, scybala. Tenesmus accompanies the

evacuation of the bowels; and there is more or less of fever connected with this complaint.

When a Polypus is large, and situated so high up in the great bowel, as to be beyond the reach of an operation, it must form at length a fatal cause of obstruction. The difficulty in passing the fæces must become greater and greater, till the obstruction is complete. Patients are generally sensible of the obstruction being at a particular part of the bowel, and often suffer much from flatulency and the accumulation of fæces above the polypus, and from colicky pains. The patient, too, is occasionally affected with sickness and vomiting. When the polypus is very low down in the rectum, and not very large, it forms a partial obstruction to the passage of the fæces, and can in general be removed by a ligature, or by the knife.

The Symptoms attending Piles are swellings at the verge of the anus, or in the rectum immediately above it, pain at the anus during the passage of the fæces, frequently an evacuation of blood, besides occasional feelings of irritation in the parts affected. This disease is often preceded by other affections, such as giddiness, difficulty of breathing, colicky pains, and pains in the loins.

The Symptoms which attend the round Worm of the Intestines are a swelled belly, emaciated extremities, an offensive breath, and a deranged appetite. The appetite is often greater than in health; but sometimes it is much less. The stools are slimy; and the patient

frequently picks his nose, and during sleep grinds his teeth.

Persons afflicted with the Tænia, complain of a gnawing, uneasy feeling in the region of the stomach, which is removed or diminished by eating. Their appetite is commonly somewhat voracious, but occasionally it is less than natural. They have commonly an itching at the nose, often nausea, colicky pains, and sometimes giddiness. Some have a cough, and others occasional convulsions.

When Ascarides are lodged in the Rectum, there is an uneasy feeling there, and a violent itching at the anus. There is also a sense of heat in the parts, with occasional tenesmus and mucous stools. The mucus is sometimes mixed with blood, and along with it some living ascarides are often discharged.*

The Symptoms attending Alvine Concretions are not likely to be always very distinctly marked. There is sometimes nausea and vomiting, and often violent attacks of pain in some part of the belly. There is frequently costiveness, and sometimes watery, mucous, and bloody stools. When the disease has been of long standing, the patient is generally much emaciated; and then the concretion can be felt like a ball, on pressing with the fingers some part of the bowels. This forms the most characteristic symptom of the disease. When the ball has got low down into the rectum, it will often, by compressing the bladder, produce an obstruction to the evacuation of the urine. In

* See Med. Trans. of the College, vol. i. p. 46.

this situation the concretion can sometimes be removed, and sometimes will pass away without any artificial assistance.

When Air is accumulated in a moderate quantity in the Intestines, it is known to exist by some fulness of the abdomen, and by the air shifting frequently its situation. This is sometimes attended with a kind of gurgling noise, and forms swellings in particular parts of the belly. A quantity of air is sometimes expelled by the mouth and the rectum. There is generally at the same time costiveness, and occasional colicky pains.

When Air is accumulated in very large quantity, then it forms a serious disease called Tympanitis. Of this I have seen a few instances. The abdomen is extremely swelled, very tense, and there is a quick reaction of the parts after removing the pressure of the fingers, similar to what takes place in an ox's bladder, distended with air. When the abdomen in tympanitis is struck with the fingers, there is exactly the same sound as when an inflated bladder is struck in a similar way; but this sound never takes place on striking the belly in ascites. There is no sense of fluctuation in tympanitis; but in ascites this is commonly distinct. There is often difficulty of breathing, which is produced by the accumulation of the air pushing up the diaphragm, and impeding its free motion. There are severe colicky pains, and quantities of air are frequently expelled both upwards and downwards. The bowels are costive, and there is a difficulty in making water, which is probably occasioned by the accumulation of air in the rectum.

The Symptoms of an Inflamed Mesentery cannot be separated from those which belong to inflammation of the peritonæum generally; and these symptoms have been already described.

The Symptoms which attend the enlargement of the Mesenteric Glands from Scrofula correspond very much, in the most striking circumstances, with the symptoms which are produced by the common round worm of the intestines. In both diseases there is a tumid abdomen, and emaciated extremities. They are chiefly to be distinguished by worms not being discovered in the one disease, notwithstanding the use of strong purgatives, while they pass off from the bowels in the other. The startings, the itching of the nose, and the grinding of the teeth, may perhaps also form some ground of distinction between the two diseases: they occur very commonly in worms, but I believe rarely where the glands of the mesentery are scrofulous. Some discrimination likewise between the two diseases may sometimes be derived from examining strictly into the nature of the constitution. If decided marks of scrofula show themselves, they will lead more satisfactorily to the opinion that the mesenteric glands are also affected with the same disease.

CHAP. IX.

DISEASED APPEARANCES OF THE LIVER.

Inflammation of the Membrane of the Liver.

THE external Membrane of the Liver is not uncommonly found in a state of Inflammation.

This may take place when the peritonæum over the whole cavity of the abdomen is inflamed, or the inflammation may be confined to the membrane of the liver itself. When confined to the membrane of the liver, it is not frequently extended over the whole of it, but more commonly takes place in that portion which covers the anterior, or convex part of the liver. I have also seen inflammation, or at least its effects, not unfrequently on that side of the liver which is in contact with the stomach and the duodenum. When inflammation takes place in the membrane of the liver, it exhibits exactly the same appearances, which have been described when speaking of inflammation of the peritonæum, of which it is a part. It is crowded with a great number of very minute vessels, which contain florid blood, and is thicker than in its natural state. There is also formed on its surface a layer of coagulable lymph: this layer is thicker on some occasions than others, and often glues the liver, more or less completely, to the neighbouring parts. Some quantity of serous fluid is at the same time poured out.

Adhesions.

It is more common to see Adhesions formed, which are the consequence of a previous Inflammation in the Membrane of the Liver, than to see the membrane in an actual state of inflammation. These adhesions are formed from the coagulable lymph of the blood, which undergoes a gradual change, as formerly described. They consist very commonly of a fine transparent membrane, which unites the surface of the liver to the neighbouring parts. This union may either be general, over one extended surface of the liver, or it may consist of a number of processes of adhesion: the adhesion is sometimes by a membrane of considerable length; and sometimes is very close, the surface of the liver being immediately applied to the neighbouring parts. The surface of the liver where these adhesions are most commonly found, is the anterior, by which it is joined to the peritonæum lining the muscles at the upper part of the cavity of the abdomen.

When an abscess is formed in the substance of the liver, and points externally, these adhesions are of great use in preventing the pus from escaping into the general cavity of the abdomen. Adhesions are also frequently found connecting the posterior surface of the liver with the stomach, and the duodenum; and these may also be useful in abscesses of the liver near its posterior surface, by preventing the matter from passing into the general cavity of the abdomen, and conducting it either into the stomach, or into the upper part of the intestinal canal.

Coats of the Liver converted into Cartilage.

A PART of the Coats of the Liver is sometimes changed into Cartilage. Of this I have seen a few instances; but it occurs much more rarely in the liver than in the spleen. The cartilage is smooth, thin, and soft, in its texture.

Inflammation of the Substance of the Liver.

IT does not often happen, in this country, that the substance of the liver is found in an actual state of inflammation. Where its membrane is inflamed, the substance is sometimes inflamed which lies immediately under it; but it rarely happens that the general mass of the liver is inflamed. In warmer countries, the substance of the liver is much more liable to inflammation than in Great Britain. When the liver is generally inflamed through its substance, it is a good deal enlarged in its size, and of a purple colour.* It is also harder than in its healthy state. Its outer membrane is sometimes affected by the inflammation, and sometimes it is not. It is attended occasionally with a jaundiced colour of skin, arising from the bile not getting readily into the ductus communis choledochus, on account of the pressure of the inflamed liver on the pori biliarii. When this inflammation has continued for some time, abscesses are

* May not the purple colour arise from the accumulation of blood in the branches of the vena portarum?

As this vein performs the office of an artery in the liver, is it not probable that its small branches take on the same actions as the small branches of an artery, during inflammation?

formed, and then the active state of the inflammation very much subsides. These abscesses are sometimes of a large size, so as even to contain some pints of pus. Sometimes almost the whole of the liver is converted into a bag containing pus. When inflammations of the liver have been of considerable duration, they are not uncommonly attended with ascites, and the water is of a yellow, or green colour, being tinged by the bile.

The liver has sometimes been said to have been in a state of mortification.* This, however, occurs very rarely, and has never fallen under my observation.

Common Tubercle of the Liver.

One of the most common diseases in the Liver, and perhaps the most common, except adhesions, is the formation of Tubercles in its substance. This disease is hardly ever met with in very young persons, but frequently takes place in those of middle or advanced age: it is likewise more common in men than in women. It is more apt to occur in those who have been accustomed to drink spirituous liquors, but it will likewise frequently take place in persons who have not indulged in this bad habit, and who have lived with general temperance.

The Tubercles which are formed in this disease occupy generally the whole mass of the liver, are placed very near each other, and are of a rounded shape. They give an appearance every where of irregularity to its surface. When cut into, they are found to consist of a brownish or yellowish white solid matter.

* Vid. Morgagni, epist. xxxiv. art. 25. Also see Portal's Anatomie Médicale, tom. v. p. 306.

They are sometimes of a very small size, not larger than the heads of large pins; but most frequently they are as large as small hazel-nuts, and many of them are sometimes larger. When the liver is thus tuberculated, it feels much harder to the touch than natural, and not uncommonly its lower edge is bent a little forward. Its size, however, is generally not larger than in the healthy state, and I think it is often smaller. If a section of the liver be made in this state, its vessels seem to have a smaller diameter than naturally. It very frequently happens that in this state the liver is of a yellow colour, arising from the bile accumulated in its substance; and there is also water in the cavity of the abdomen, which is yellow from the mixture of bile. The gall-bladder is generally much contracted, and of a white colour, from its being empty. The bile, from the pressure of the hard liver upon the pori biliarii, does not reach the hepatic duct, and therefore cannot pass into the gall-bladder. The colour of the skin in such cases is jaundiced, and in general it remains permanently so, as it depends on a state of liver scarcely liable to change. This is the common appearance of what is generally called a scirrhous liver: but it bears only a remote resemblance to scirrhus, in other parts of the body. I should, therefore, be disposed to consider it as a peculiar disease affecting this viscus. When the jaundice has continued for a long time, as is commonly the case in this diseased state of the liver, the blood in all the blood-vessels of the body is either found not to be coagulated at all after death, or to be coagulated very loosely. Whether this be the constant state of the blood in such cases or not, I am not able to determine. Most probably, however, it is, as it is

reasonable to think, that it depends on the chemical influence of a mixture of a certain proportion of bile with the blood.

Large White Tubercle of the Liver.

HARD white Tubercles are sometimes formed in the Liver. They are often as large as a chestnut; but I have seen them both a good deal larger and smaller. They are to be found near the surface of the liver in greater number than near the middle of its substance: two or three frequently lie contiguous to each other, with a considerable portion of the liver, in a healthy state, interposed between them and a cluster of similar tubercles. They consist of a firm, opaque, white substance, and are generally somewhat depressed, or hollow, on their outer surface. The liver in this disease is frequently a good deal enlarged beyond its natural size.

These tubercles appear to be first formed round the blood-vessels of the liver, as is seen by making sections of a liver in this state. While the liver is under such circumstances of disease, there is sometimes water in the cavity of the abdomen: the liver is sometimes tinged in its colour from the accumulation of bile, and sometimes the colour of its substance between the tubercles is perfectly natural.

The kind of tubercle now described is much more rare than the other, and resembles more the ordinary appearance of scirrhus in other part of the body. In one or two instances, however, I have observed a thick sort of pus lodged in this species of tubercle, resembling very much the pus from a scrofulous sore; and

therefore I am rather disposed to think that this tubercle may be of a scrofulous nature; but no satisfactory opinion can be formed on this single circumstance.

Soft Brown Tubercles of the Liver.

I HAVE also seen in the Liver a number of soft Tumors, about the size of a walnut: they were principally situated at the surface of the liver, and consisted of a smooth, soft, brownish matter. This is a very rare appearance of disease: such tumors would by many be considered as scrofulous, but there is no good evidence in support of this opinion; and there is certainly no resemblance between this sort of tumor and either a scrofulous tubercle of the lungs, or a scrofulous absorbent gland. About its real nature nothing satisfactory is ascertained.

Scrofulous Tubercles of the Liver.

TUBERCLES are occasionally found in the Liver, which bear a strong resemblance to the Scrofulous tubercles of the lungs; but this is a very rare appearance of disease. They have the same size, the same structure, and the same feeling to the touch, but are a little browner in their colour. In the only instance which I have seen of this disease, the tubercles were dispersed through the substance of the liver at pretty regular distances, but did not render the surface of the liver irregular, as in the common sort of tubercle. From their appearance and structure I am strongly disposed to consider them as scrofulous.

Scirrhous Tubercles of the Liver. (Ed.)

In a patient who died of Scirrhus of the pylorus, numerous scirrhous tubercles were found both in the omentum and scattered throughout the substance of the Liver. These were about the bulk and of the shape of peas, of a light grey colour, very hard, and when cut into resembled the scirrhous tubercle in other organs.

Hæmatoid Tubercle of the Liver. (Ed.)

Fungus Hæmatodes has been found in the Liver, but I have only seen it in this viscus as a secondary symptom of the disease. In some instances Tubercles of a medullary structure are formed in the substance of the liver, in the midst of some of which there are cavities filled with a pulpy matter, or with an admixture of blood. Other tubercles are formed near the surface of the liver, from which a fungus in some cases grows, and protrudes externally.

Melanoid Tubercle of the Liver. (Ed.)

Some cases of the Melanoid Tubercle in the Liver are described in my account of Fungus Hæmatodes.* This disease has only been observed in the liver when other parts had been primarily affected. The melanose tubercle is remarkable for its dark colour, being that of Indian ink, more or less diluted. They are rather firmer than the hæmatoid tubercles, are distinctly cir-

* See Treatise on Fungus Hæmatodes.

cumscribed, and are found interspersed throughout the substance of the liver in rounded masses, varying from the size of a pea to that of a walnut.

Liver Flaccid, with Reddish Tumors.

I HAVE likewise seen the Liver much more flaccid in its substance than is natural, with reddish soft Tumors, of considerable size, interspersed through it, which contained a thick sort of pus. I am not acquainted with the real nature of these tumors; but I think it proper to mention that they were found in a person whose general constitution had strong marks of scrofula, and in whom were also found many scrofulous absorbent glands on examining the body. They probably may have belonged to that species of disease which is called the fungus hæmatodes.

Liver very soft in its Substance.

THE Liver is not unusually found much more flaccid in its substance than natural without any other appearance of disease. It feels, on such occasions, nearly as soft as the spleen, and is commonly of a leaden colour. This change must arise from a process which takes place through its whole substance, and seems to be what John Hunter has called the interstitial absorption. By this process is meant, the absorbents removing insensibly the very minute parts out of the general mass of any structure in an animal body without ulceration. This state of liver is rarely, if ever, found in a very young person, and is most common in those who are advanced in life.

Liver very hard in its Substance.

THERE is a state of the Liver, not at all unusual, where it is much harder than natural, and when cut into, exhibits no peculiar structure. Upon the surface of livers thus changed there is not uncommonly a thready appearance of membrane, disposed somewhat in a radiated form, and the lower edge is bent a little forwards. This I believe to be the first step in the progress towards the formation of the common tuberculated liver. I have sometimes seen very small tubercles formed on a part of the surface of such a liver, which were exactly of the common sort. From this appearance, it is probable, that additional matter is deposited in the interstices through the general mass of the liver, rendering it much harder, and that this matter, together, perhaps, with part of the ordinary structure of the liver, is converted into tubercles. This hardened state of the liver is sometimes accompanied with an incipient ascites.

Hydatids.

THERE is no gland in the human body, except the kidneys*, in which Hydatids are so frequently found as in the Liver. Hydatids of the liver are usually found in a cyst, which is frequently of considerable size, and is formed of very firm materials, so as to give

* Although the Hydatids of the Liver, and the Kidney, have got the same name, yet frequently they differ from each other. Hydatids, however, occasionally occur in the kidneys, which are precisely of the same kind with those of the liver.

to the touch almost the feeling of cartilage. This cyst, when cut into, is obviously laminated, and is much thicker in one instance than in another. In some livers it is not thicker than a shilling, and in others it is nearly a quarter of an inch in thickness. The laminæ which compose it are formed of a white matter, and on the inside there is a lining of a pulpy substance, like coagulable lymph. The cavity of the cyst I have seen, in one instance, subdivided by a partition of this pulpy substance. In a cyst may be found one hydatid, or a greater number of them. They lie loose in the cavity, swimming in a fluid; or some of them are attached to the side of the cyst. They consist each of a round bag, which is composed of a white, semi-opaque, pulpy matter, and contains a fluid capable of coagulation. Although the common colour of hydatids be white, yet I have occasionally seen some of a light amber colour. The bag of the hydatid consists of two laminæ, and possesses a good deal of contractile power. In one hydatid this coat, or bag, is much thicker and more opaque than in another, and even in the same hydatid different parts of it will often differ in thickness. On the inside of an hydatid, smaller ones are sometimes found, which are commonly not larger than the heads of pins, but sometimes they are even larger than a gooseberry. These are attached to the larger hydatid, either scattered at irregular distances, or in small clusters; they are also found floating loose in the liquor of the larger hydatids. Hydatids of the liver are often found unconnected with each other; but sometimes they have been said to inclose each other in a series, like pill-boxes. The most common situation of hydatids of the liver is in

its substance, and inclosed in a cyst; but they are occasionally attached to the outer surface of the liver hanging from it, and occupying more or less of the general cavity of the abdomen.

The origin and real nature of these hydatids are not fully ascertained: it is extremely probable, however, that they are a sort of imperfect animalcules. There is no doubt that the hydatids in the livers of sheep are animalcules: they have been often seen to move when taken out of the liver and put into warm water; and they retain this power of motion for a good many hours after a sheep has been killed. The analogy is very strong between hydatids in the liver of sheep, and in that of the human subject. In both they are contained in strong cysts, and in both they consist of the same white pulpy matter. There is undoubtedly some difference between them in simplicity of organisation; the hydatid in the human liver being a simple uniform bag, and the hydatid in that of the sheep having a neck and mouth appended to the bag. This difference, however, need be no real objection to the opinion above stated. Life may be attached to the most simple form of organisation. In proof of this, hydatids have been found in the brains of sheep, almost exactly resembling those in the human liver, which have been seen to move, and therefore are certainly known to be animalcules. The hydatids of the human liver, indeed, have not, as far as I know, been found to move when taken out of the body and put into warm water; had this ever happened, no uncertainty would remain. It is not difficult to see a good reason why there will hardly occur any proper opportunity of making this experiment. Hydatids are not very often found in the

liver: and the body is allowed to remain for so long a time after death before it is examined, that the hydatids, even if they were animalcules, must have lost their living principle. The probability of their being animalcules, however, is very strong; and it appears even more difficult to account for their production according to the common theory of generation, than for that of intestinal worms. We do not get rid of the difficulty by asserting that hydatids in the human liver are not living animals, because in sheep they are certainly such, where the difficulty of accounting for their production is precisely the same. Those who wish to become more minutely acquainted with the nature of hydatids, will find an excellent account of them published by Dr. John Hunter in the first volume of the Medical and Chirurgical Transactions.

Cysts in the Liver, containing an Earthy Matter.

Cysts are occasionally formed in the Liver, containing an earthy matter. The cysts are composed of a kind of cartilaginous substance mixed with bone. The earthy substance contained in the cyst is soft, smooth, and of a brownish white colour. It is mixed with soft films resembling a good deal in their appearance the coats of an hydatid.

Rupture of the Liver.

The Liver is more liable to be ruptured by external violence than any other gland of the body, which probably arises from two causes. The one is, that in thin persons the liver, more especially when large, lies near

the surface of the body, and therefore may be readily affected by a strong external pressure: the other is, that the liver consists of a structure, the parts of which are more easily separated from each other by pressure, than those of almost any other organ in the body. Thus, if the thumb or the finger be pressed against the liver with a good deal of force, it gives way much in the same manner as a rotten pear, although not so readily. This state does not depend on the liver being softened by putrefaction, because it will take place in the liver of a person immediately after death. It depends on its peculiar structure, and therefore may take place in the liver of a person who is alive, as well as of one who is dead. If the same degree of pressure be applied to a muscle, or to many glands of the body, they are not ruptured, but recover themselves after the pressure has been removed. When ruptures have taken place in the liver, they have happened from some strong pressure applied to the upper part of the abdomen; as, for instance, from the wheel of a carriage passing over that part of the body. Little pain has been felt from such an injury; which is a proof, among many others, of the livers not possessing much sensibility; and some of the persons to whom this accident has happened have lived for several days.

Worms in the Liver.

Worms* have been said to be found in cysts of the liver, as well as in the biliary ducts. Instances of this sort are extremely rare, and have not come under my observation.

* Vide Lieutaud, tom. i. p. 194.

SYMPTOMS.

When the Coat of the Liver is inflamed, more especially on its convex surface, the symptoms correspond a good deal with those of pleurisy, in which the inflammation has attacked the lower part of the pleura on the right side. There is acute pain in the part affected, difficulty of breathing, cough, and symptomatic fever. The two affections may, however, be in general distinguished from each other by the following circumstances. When the coat of the liver is inflamed, the pain will be less increased on deep inspiration, than where the pleura at the lower part of the right side of the chest is inflamed. In inflammation of the coat of the liver, there will be a considerable increase of pain on pressure immediately under the margin of the ribs, on the right side, which will not take place in inflammation of the pleura.

I am not acquainted with any Symptoms which attend Adhesions of the Liver to the neighbouring parts.

When the Substance of the Liver is Inflamed, there is an obtuse pain in the right hypochondrium, and a pain is often felt at the top of the right shoulder. The patient can lie most easily on the side affected. There is more or less symptomatic fever, sometimes a dry cough, sometimes hiccough, sometimes vomiting, and occasionally a yellow colour of the skin and eyes. Inflammation of the substance of the liver sometimes takes place so very slowly, that it is hardly attended with any pain, and the constitution is not at all or very

little affected with symptoms of fever. On such occasions an inflammation of the liver is not suspected, till an abscess has actually been formed, and begins to make its progress outwards.

I know of no peculiar Symptoms by which the Liver can be ascertained, in the living body, to be studded with Tubercles. When, however, there is pain or an uneasy feeling in the region of the liver, together with a jaundiced colour of the skin, which continues permanent, and water is at the same time accumulated in the cavity of the abdomen, there remains little doubt of the liver being tuberculated. When the parietes of the abdomen are thin, and water is accumulated in small quantity in that cavity, the tubercles on the anterior surface, and at the lower edge of the liver, can sometimes be distinctly felt, on attentive examination.

The Symptoms which belong to the Large White Tubercle of the Liver I cannot distinguish from those of the common tubercle. Sometimes, however, when the person is thin, and the tubercles are near the lower edge of the liver, they can be distinguished by an external examination. I believe that the large white tubercle is not so often attended with jaundice and ascites as the other.

The symptoms which belong to the other tubercles of the liver are unknown to me. It is probable that there are none which are discriminative.

When the Liver is becoming hard in its substance, the exact state of it cannot be determined in the living

body, unless the person be so thin that it can be distinctly felt on examination. This, however, will frequently be very difficult, and on many occasions impossible; because the liver, when hard, is commonly not increased in its size, and the parietes of the abdomen are of considerable thickness. If there be some sense of uneasiness in the region of the liver, along with a sallow countenance, this disease may be suspected. It has sometimes happened, however, that the liver has been discovered to be hard, on an examination after death, when no symptoms had been observed during life, which led to an opinion of this disease having taken place.

There are no Symptoms which particularly characterise the formation of Hydatids in the Liver; and this disease can only be guessed at in the living body. It appears from the history of some cases of this kind, that a pain is felt in the right hypochondrium; but this may arise from many other causes.

In two cases which have come to my knowledge, the symptoms were similar to those which attend an attack of gall-stones. There was a violent spasmodic pain near the pit of the stomach, frequent vomiting, and jaundice, with a pulse not accelerated. These attacks occurred frequently in both cases, after considerable intervals of tolerably good health.

When hydatids are confined within the substance of the liver, I do not see how it is possible that their existence should be ascertained; but when they are formed on its outer surface, near its lower edge, their existence may, in some degree, be ascertained by examination, more especially if the person be thin. When,

however, the parietes of the abdomen are thick, and the hydatids, or their cysts, are not distinct, but lie in contact with each other, making an irregular tumor, it will hardly be possible to form an accurate opinion by examination. If the tumor be gradually formed, and the general health be little affected, it is probable that it consists of hydatids. An accurate attention to the sensation which the tumor yields on pressure, or on striking it gently with the hand, may also assist in forming a probable conjecture about its nature. Where the tumor consists of hydatids, it will generally feel to a certain degree soft; and if the hydatids should be very large, there may be an obscure sense of fluctuation on striking the tumor with one hand, while the other is applied to the opposite side of it. If, moreover, the tumor should occupy a great part of the cavity of the abdomen, and can be clearly traced from the liver, as the source of its growth, there can be little doubt of the existence of hydatids.

CHAP. X.

DISEASED APPEARANCES OF THE GALL-BLADDER.

Inflammation of the Coats of the Gall-Bladder.

The Coats of the Gall-Bladder are very rarely inflamed, without inflammation of the membrane which covers the posterior surface of the liver. When inflammation attacks this membrane, it naturally spreads over the outer coat of the gall-bladder, which is a continuation of it, and may affect the other coats of the gall-bladder, if it should have arisen to a violent degree. Inflammation, however, of the outer coat of the gall-bladder will not commonly be attended with inflammation of the other coats, because it is not closely applied to them, a considerable quantity of cellular membrane being interposed. The appearances of inflammation of the coats of the gall-bladder are similar to what take place in inflammation of the stomach or intestines. These have already been fully described, and need not be repeated.

Adhesions of the Gall-Bladder.

It is a very common appearance, on dissection, to find the Gall-Bladder connected by Adhesions, either to the small end of the stomach, or to the beginning of the duodenum. These are the consequence of a

previous inflammation in the outer coat of the gall-bladder, and exactly resemble the adhesions already described.

Ulcers in the Gall-Bladder.

INFLAMMATION of the Gall-Bladder rarely advances to Ulceration. The accumulation of gall-stones in that viscus, as far as I have observed, very seldom produces this effect.* Ulceration of the gall-bladder, however, occasionally takes place, and I believe almost always begins in the mucous membrane. Of this I have known two cases. In the one case several ulcers were found in the mucous membrane of the gall-bladder, while the other coats were not affected; and in the other there was one ulcer, which had destroyed a part of all the coats.

Coats of the Gall-Bladder Thickened, and Hard Tubercles formed in them.

I HAVE had but one opportunity of observing this change in the Gall-Bladder: its coats were above a quarter of an inch thick, and were studded with tubercles of a considerable size, and very firm in their texture. The liver to which this gall-bladder belonged was affected with the same disease.

* I have myself seen but one instance of Inflammation and Ulceration of the Gall-Bladder produced by gall-stones. Soemmerring, however, has seen a good many instances of ulcers on the inner surface of the gall-bladder, from the irritation of gall-stones.

Coats of the Gall-Bladder Bony.

I HAVE likewise seen the Coats of the Gall-Bladder very much thickened, and converted in many parts into a sort of bony substance; but this is a very rare appearance.

DISEASED STATE OF THE BILIARY DUCTS.

Dilatation of the Biliary Ducts.

THE most common diseased appearance of the Biliary Ducts is their Dilatation. The ductus hepaticus, ductus cysticus, and ductus communis choledochus, are sometimes dilated to an almost incredible size. I have seen the ductus hepaticus and ductus choledochus so much dilated, as to be nearly an inch in their transverse diameter. These dilatations of the biliary ducts take place in consequence of the passage of gall-stones; and it is astonishing how large gall-stones sometimes pass into the duodenum. This ought to afford a strong ground of comfort to persons who are labouring under so distressing a complaint.

Obliteration of the Biliary Ducts.

AN Obliteration of any of the Biliary Ducts happens very rarely, but instances of this disease have been discovered; and they may be traced to the following causes. One cause is a violent inflammation of the inner surface of some of the biliary ducts which has terminated in an adhesion of its sides. This may be supposed to arise most commonly from the irritation

of a rough gall-stone, in its passage towards the duodenum. A similar adhesion has been known to take place in other canals of the body, in consequence of violent inflammation, as, for instance, in the vagina. Another cause which may act upon the lower extremity of the ductus communis choledochus, obliterating its cavity at that part, is a violent inflammation of the duodenum at the entrance of the duct; the extremity of the duct being involved in the inflammation, may thus have its canal obliterated. To these may be added, as a third cause of obliteration, a scirrhous, or any other enlargement of the round head of the pancreas, which may so press upon the lower extremity of the ductus communis choledochus, as to annihilate its cavity. I have seen only one instance of obliteration in the ductus cysticus; but Dr. Storer of Nottingham, whose ability and industry in his profession are well known, has favoured me with an account of two cases of obliteration at the end of the ductus communis choledochus.

A Preternatural Canal of Communication between the Gall-Bladder and the Stomach.

It may not be improper to take notice here, that I have once seen an immediate communication, by a short canal, between the gall-bladder and the small end of the stomach. This lusus naturæ is very rare, and but a few instances of it have been recorded.

Gall-Stones.

It is not an uncommon appearance of disease in examining dead bodies, to find Gall-Stones, either in

the gall-bladder, or in some of the biliary ducts. The gall-bladder is sometimes much enlarged, and full of them. In this case its coats are often a good deal thickened, which arises partly from the pressure against the gall-bladder, in consequence of the accumulation of the stones, and partly from the efforts of the contractile power of the gall-bladder to expel them. The number of stones accumulated in the gall-bladder is sometimes very great; above a thousand have been taken out of one gall-bladder, which are preserved in William Hunter's Museum. When there is a solitary stone in the gall-bladder, it is occasionally very large; I have known an instance of one which was fully the size of a hen's egg. When there is but one gall-stone either in the gall-bladder, or in the biliary ducts, it is generally of an oval shape; when there is a considerable number, they acquire, by rubbing upon each other in a small space, a great many sides and angles.

There is great variety in the external appearance of gall-stones with respect to colour: some are whitish, others are black; they are also of a yellowish, a greenish, a light brown, a dark brown, and a reddish brown colour. These are the principal varieties in colour, but there are many other smaller differences which it is very difficult to express in words. Gall-stones differ also very much in their surface, some being very smooth, and others very rough.

When cut or broken, gall-stones are commonly found to consist externally of concentric laminæ, and in the centre they have a radiated structure. The laminated part sometimes bears a large proportion to the other, and sometimes the contrary. The laminated

and radiated structures are sometimes compact, and sometimes consist of a more loose matter. It likewise occasionally happens that both the laminated and the radiated structures are very obscure, and the gall-stone appears a good deal like an uniform solid mass. The laminated part or the outside very frequently consists of a substance different in appearance from the radiated structure in the centre; and it is not unusual to find the structure in the centre to consist of shining white crystallisations, which have a good deal the look of mica or spermaceti.

Gall-stones being very different from each other, both in their outward appearance and in their internal structure, we are naturally led to suppose that they may also differ in their chemical properties. On this subject I can only speak generally; but such trials as I have made, incline me to this opinion. Very few gall-stones yield a bitter taste, which shows that commonly they do not consist of inspissated bile; but in some I have found the taste intensely bitter. Almost all of them melt in the flame of a candle; but I have met with one sort, of a very black colour, which did not melt, but burnt exactly like a cinder.*

All the gall-stones which I have examined dissolve in nitric acid. They are separated into a fine black powder when put into the sulphuric acid, especially if exposed to a sand heat. They are not acted upon at all by the muriatic acid in the common heat

* Soemmerring considers these as inspissated bile, and mentions, that they have no regular form, have a bitter taste, and are soluble in water. In some trials which I made, they did not dissolve in distilled water, either cold or hot; but they are bitter to the taste, and without any regular shape, or appearance of crystallisation.

of the atmosphere; and are even but little affected by it when exposed to a sand heat for a considerable time.

Most of the gall-stones which I have examined, are either not very soluble in oil of turpentine in the common heat of the atmosphere, or the process goes on very slowly: one sort I have found to be altogether insoluble in this heat. When put into this oil, and exposed to a sand heat, they are much more readily acted upon. Some are converted into a kind of oil, which sinks to the bottom of the oil of turpentine; others are partly dissolved, tinging the oil of turpentine of a brownish colour, and are partly separated into a powder.

Most gall-stones appear not to be readily affected by spirit of wine in the common heat of the atmosphere, but are either partly or entirely soluble in it at a boiling heat.* Such are the general results of a good many of my trials, but although I paid a good deal of attention to chemistry at an early period of my life, I should rely on them with little confidence, if they did not in a great measure correspond with the experiments of others who are more conversant than myself both with the scientific and practical parts of chemistry.

* When some biliary calculi are exposed to spirit of wine in a boiling state, white flaky crystals are soon formed upon its cooling. When they are exposed to spirit of wine in the common heat of the atmosphere, it is some weeks before crystals begin to be formed, and they appear to be more pointed in their shape than the former. These crystals were, I believe, first observed by M. Poulletier de la Salle. See Elémens d'Histoire Naturelle et de Chimie, par M. de Fourcroy, tom. iv. p. 354.

Gall-stones, according to the experiments of Gren, consist of a substance possessing the properties of wax and of lymph. *

A gall-stone, consisting of a chocolate-coloured substance on the outside, and of white radiated lamellæ on the inside, was found by Dr. Saunders to consist of a resinous matter, with a small proportion of earth, apparently the calcareous, and some mineral and volatile alkali.†

The gall-stones which Dr. Powell examined were found to consist of resinous matter, carbon, and an animal substance resembling dried mucus.‡ This subject seems still to be imperfectly known, and to require further investigation.

Bile.

The Bile in the gall-bladder is found to differ in different bodies; but this difference is too common to arise from disease, and must depend on natural circumstances. It is sometimes of a green, at other times of a brownish yellow, or a purer yellow colour. The brownish yellow colour is the most common. It is always more or less viscid, and the variety in this respect is considerable. In man it generally appears a good deal more viscid than in most other animals. In one case, I have seen it as ropy as the mucus which is commonly coughed up from the trachea. I recollect also another case, where the bile in the gall-bladder resembled exactly the white of egg. This kind of sub-

* See Johnson's Animal Chemistry, vol. ii. p. 355.

† See Dr. Saunders's Treatise on the Liver, p. 119. first edition.

‡ See Dr. Powell's Observations on the Bile and its Diseases,

stance is ascertained to form one of the constituent parts of the bile; and in the present instance it should seem that the other parts were wanting. Such an effect may be supposed to have depended on a very imperfect action of the secretory structure of the liver. The liver in this case was not sound, being studded with scrofulous tubercles, and the absorbent glands of the mesentery were affected with the same disease.

In opening dead bodies, the bile is almost always found to have transuded in small quantity through the coats of the gall-bladder, so as to tinge the neighbouring parts, especially the small end of the stomach, and the beginning of the duodenum. This is to be considered as an effect, which has taken place after death, and not as a diseased appearance: the coats of the gall-bladder, in consequence of death, having lost that compactness by which they were formerly able to confine the bile.

The Gall-Bladder Distended with Bile.

THE Gall-Bladder is sometimes so distended with bile, as to be of nearly twice its usual size; at other times there is no bile at all in its cavity; and under such circumstances its colour is white, and it is contracted to a very small size.

Hydatids in the Gall-Bladder.

THE Gall-Bladder has been known to be distended to an immense size, and to contain Hydatids*; but

* See Medical Communications, vol. i. p. 101.

this state of it is to be considered as extremely uncommon.

The Gall-Bladder Wanting.

THE Gall-Bladder has also been known to be wanting from a defect of original formation.* It has never occurred to me to see an example of this kind; but it may be the more readily believed to happen sometimes, as the gall-bladder does not serve any necessary purpose in the body. There are many classes of animals which are naturally without a gall-bladder.

SYMPTOMS.

INFLAMMATION of the Coats of the Gall-Bladder is not known by any peculiar Symptoms. They are probably much the same with the symptoms which attend inflammation of the membranous covering of the liver.

An Obliteration either of the Hepatic Duct or of the ductus communis choledochus, must produce a permanent jaundice, because it depends on a cause not liable to change. This will be extremely difficult to distinguish from jaundice produced by a hardened or tuberculated state of the liver, for this cause of jaundice may likewise be said to be generally permanent. When the ductus cysticus only is obliterated, there will be no jaundice, and little inconvenience will probably be felt, unless the bile confined in the gall-bladder should at length irritate its coats. In this case inflammation

* See Dr. Soemmerring's Germ. Translat. p. 150.

may be excited, which may advance to suppuration. I have seen an ulcer of the gall-bladder, which appeared to be produced by this cause.

While Gall-stones remain in the gall-bladder, and no attempt is made towards their passing through the ductus cysticus, and ductus communis choledochus, very little inconvenience is commonly produced by them. It frequently happens that gall-stones are found in the gall-bladder after death, where there was not the least suspicion of their existence during life. When they pass through the ducts, more especially if they be large in their size, a most excruciating pain is commonly felt about the pit of the stomach. Patients in this case express a much stronger feeling of pain, than during a violent inflammation even in the most sensible parts of the body. They often cry out, and writhe or twist their body into various postures. When the pulse is felt during this exquisite pain, it is sometimes found to be accelerated in a very trifling degree, but generally it is not more frequent than in health, and sometimes it is even slower. There is languor, sickness, and vomiting; and the skin becomes, in the progress of the disease, more or less of a yellow colour.

CHAP. XI.

DISEASED APPEARANCES OF THE SPLEEN.

Inflammation of the Coats of the Spleen.

The Coats of the Spleen are liable to Inflammation; but this rarely takes place unless the peritonæum in the neighbourhood be also affected. The proper capsule of the spleen is so intimately connected with the peritonæum which is reflected over it, that it must necessarily partake of any inflammation affecting that portion of the membrane. When inflammation attacks the coats of the spleen, it exhibits exactly the same appearances which have been so often described. They become much more crowded with florid blood-vessels than in a natural state, are somewhat thicker, and throw out a layer of coagulable lymph upon their surface.

Adhesions of the Spleen.

It is more common, however, to find Adhesions formed between the Spleen and the neighbouring parts, than to find its coats in an actual state of inflammation. These adhesions consist of a white transparent membrane of more or less firmness, and generally connect the broad surface of the spleen more or less closely to the diaphragm. They often connect also the spleen to the great end of the stomach, and a part of the transverse arch of the colon.

Coats of the Spleen Cartilaginous.

The Coats of the Spleen are sometimes converted into Cartilage; and this disease may be considered in a great measure as peculiar to the spleen. It is, at least, much more common in this viscus than in any other.

The cartilage is generally to be found on the convex surface of the spleen, and extends over more or less of it in different cases. It is much thicker in one case than another: in some being not thicker than a shilling, and in others four times as thick. It is generally formed in a smooth layer, but occasionally it is somewhat irregular. I have also seen, in some instances, small spots of cartilage over the whole surface of the spleen. It should appear that ossifications are sometimes to be found in this cartilage*, but in the cases which have come under my examination, bony matter was not to be observed. The cartilage into which the coats of the spleen are changed, is in general a good deal softer than that which covers the extremities of bones. This diseased process, it is natural to think, is slow in its progress, can hardly produce any impediment to the functions of the spleen, and is probably not marked by any peculiar feelings to the patient.

Inflammation of the Substance of the Spleen.

It is very rare to find the substance of the Spleen either in a state of Inflammation or suppuration; but

* Morgagni has seen an ossification of part of the capsule of the spleen. Vid. epist. x. art. 19. epist. xiv. art. 23.

such cases have occasionally been observed and related by authors.* Instances also have been related where the spleen had been observed to be mortified †; but this is probably much more rare than the former.

The Spleen extremely Soft.

THERE is an appearance of the Spleen which is very common, and which perhaps is hardly to be considered as a disease, but it is a very obvious deviation from its healthy structure. The appearance to which I allude is an extreme Softness of the Spleen, so that when its capsule is broken, which, under such circumstances, is very tender, the substance of the spleen seems to consist of little else than a very soft, brownish-red mucus, intermixed with a spongy fibrous texture. This appearance of the spleen is hardly ever to be observed at a very early period of life, but is very common in middle and more advanced age. I believe that such a state of the spleen is not marked by any peculiar feelings, so as to make the person conscious of any disease taking place, and is probably of very little consequence in the economy of the animal. Still, however, it is not a state into which the spleen naturally degenerates in the gradual decay of the body.

* Vid. Lieutaud, tom. i. p. 22.

Vid. Portal's Anatomie Médicale, tom. v. p. 333, 334.

In some of the British soldiers who suffered from the Walcheren fever, and who afterwards died in this country, I found the whole substance of the spleen converted into a puriform fluid, contained in the proper capsule of the spleen as in a sack. (*Ed.*)

† Vid. Lieutaud, tom. i. p. 223.

The Spleen very Hard.

The Spleen is sometimes much harder than natural, and at the same time is generally a good deal enlarged. It is occasionally enlarged to five or six times its natural size, and it then forms a tumor, very capable of being distinguished by an examination in the living body. When cut into, the natural structure seems to be preserved, except that it is much more compact or solid than it ought to be.

This state of the spleen is generally considered as scirrhous; but its structure is not similar to scirrhus in other parts of the body; and its real nature is probably at present not fully understood. When the spleen is in this state, water is sometimes accumulated in the cavity of the abdomen.

Tubercles in the Spleen.

The Spleen is sometimes, although rarely, studded in its substance with small Tubercles, very similar to the scrofulous tubercles of the lungs. In one instance I have seen some of these in a state of suppuration, and the pus was thick and curdy, like scrofulous pus.

Enlargement of the Spleen.

The spleen is sometimes found to be much larger than natural, but with a structure perfectly healthy; and this more commonly happens to the spleen than to any other viscus. Although it may be looked on as a monstrous growth of the spleen, rather than a disease, yet it may produce inconvenience by

its pressure, and by altering in some degree the situation of the neighbouring viscera.

Hydatids in the Spleen.

HYDATIDS are occasionally formed in the Spleen*, of the same kind with those of the liver; but they are much more common in the latter, than in the former viscus.

Stony Concretions in the Spleen.

STONY concretions† have been found occasionally in the Spleen; but such cases are very rare, and have not fallen under my own observation.

The Spleen Ruptured.

THE Spleen has sometimes been known to be ruptured, in consequence of external pressure upon that side of the body where it is situated. When the spleen is of the common size, an accident of this kind can very rarely take place, because it is well defended by the ribs of the left side; but when the spleen is very large, so that a part of it passes below the margin of the ribs into the cavity of the flank, such an accident may very readily happen.

Several Small Spleens.

THERE is a variety in the natural formation of the Spleen, which I believe does not take place in that of

* Vid. Morgagni, epist. xxxviii. art. 34.

† Vid. Lieutaud, tom. i. p. 231.

any other gland in the body. It consists in several small spleens being formed, besides the common one. They vary in their size in different instances, but I have seen some of them as large as a walnut. They are situated in the omentum, near the great end of the stomach, are supplied with blood-vessels from the splenic artery and vein, and have exactly the same structure as a common spleen. It will probably make no difference with regard to the use of the spleen, whether it be formed of one mass, or whether it consists of several distinct parts.

Spleen Wanting.

The Spleen has been said to be occasionally wanting, as a defect in the natural formation, but this is very uncommon.* We know that an animal is capable not only of existing, but also of enjoying apparent good health without a spleen. The spleen has been cut out, by way of experiment, from some quadrupeds, and they did not appear to suffer any inconvenience from the want of it. The human spleen has even been removed in a few instances, and the persons have not only recovered, but have afterwards enjoyed good health.

SYMPTOMS.

When Inflammation attacks the Coats of the Spleen, it is attended with the same Symptoms as an inflammation of that portion of the peritonæum, which lies in the left hypochondrium. There is pain in that

* Vid. Lieutaud, tom. i. p. 234.

region, which is more or less acute according to the degree of the inflammation; and this pain is increased on pressure immediately on the inside of the left margin of the ribs. If the inflammation be considerable, it is accompanied with symptomatic fever.

The Symptoms which have been described as belonging to Inflammation of the substance of the Spleen, are a fulness and sense of pain in the left hypochondrium. The pain is increased on pressure, and there is more or less symptomatic fever. In two cases of inflamed spleen, examined by William Hunter, where the inflammation had advanced to suppuration, the patients could not define accurately the seat of their pain; but the pain seemed to travel a good deal over the general cavity of the abdomen. In some instances palpitation of the heart, difficulty of breathing, and vomiting, have been observed to take place in this disease.

An enlarged and hardened state of the Spleen is not suspected or known, till the disease has made a considerable progress, so that the spleen is capable of being felt externally. It is commonly attended with no pain, and will even bear a pretty strong pressure, without any painful sensation. It may be distinguished when the spleen has arrived at a considerable size, by the situation and the general shape of the tumor. The anterior edge of the spleen can generally be felt distinctly by the hand applied to the surface of the abdomen under the margin of the ribs upon the left side; and the edge is sometimes perceived by this

examination to be notched. This state of the spleen is often attended ultimately with dropsy.

There are no peculiar Symptoms which characterise the formation of Hydatids in the Spleen. A pain has been remarked in such cases, in the left hypochondrium; but this also belongs to many other complaints. When a swelling begins in the situation of the spleen, spreads very slowly into the cavity of the abdomen, is somewhat soft, and perhaps gives some obscure sense of fluctuation, the disease may then be reasonably supposed to depend on the formation of hydatids in this organ.

CHAP. XII.

DISEASED APPEARANCES OF THE PANCREAS.

THE Pancreas is subject to very few diseases. It seldom happens on examining dead bodies that it exhibits any other than the healthy structure.

Abscess of the Pancreas.

INFLAMMATION is very little apt to affect the Pancreas. It has only occurred to me to see one instance of an Abscess formed in it. It was a good deal enlarged in size, and contained a considerable quantity of thin pus.*

Pancreas Hard.

IT is not very uncommon to find the pancreas much harder, and at the same time thicker and shorter, than natural. There is, however, little appearance of the structure being altered. This I believe to be the beginning of a process, by which the pancreas becomes truly scirrhous. In this state it very seldom shows, in any part, the real scirrhous structure. But I have seen this to be the case, which renders it very probable that the one is the beginning of a change into the

* Portal, however, has met with several instances of abscess in the pancreas, and has even seen it, in some cases, mortified. Vide tom. v. pp. 351—353.

other. When the pancreas in any part assumes the scirrhous structure, that part loses entirely its natural appearance, and is converted into a hard, uniform, white mass, intersected by membranes, like scirrhus in other parts of the body. In some cases it has been observed, in this state, to be considerably enlarged.

Calculi of the Pancreas.

CALCULI are occasionally formed in the Ducts of the Pancreas. Of this I have known only one instance. The calculi were about the size of the kernel of a hazel nut, with a very irregular surface, and of a white colour. These stones dissolved in muriatic acid with the extrication of a large quantity of carbonic gas, and were found to consist of carbonated lime.* It is not improbable, that calculi formed in the pancreas may differ somewhat from each other, as we find to happen in other calculi which are formed in the body; but as this is a very rare disease in the pancreas, it must be a long time before this point can be ascertained.

Steatomatous Tumors of the Pancreas.

STEATOMATOUS Tumors have been sometimes found adhering to the Pancreas, but this morbid appearance is extremely rare.†

Pancreas Wanting.

THE Pancreas has been said to be entirely wanting, as a defect in the original formation.‡

* See Pemberton's Treatise on the Diseases of the Abdominal Viscera, p. 92.

† Vid. Portal's Anatomie Médicale, tom. v. p. 356.

‡ Vid. Lieutaud, tom. i. p. 247.

SYMPTOMS.

I HAVE only had one opportunity of seeing an Abscess in the Pancreas. It was in a young man, a little beyond the age of twenty. He did not complain of any fixed pain in the situation of the pancreas, but had a good deal of pain in different parts of the abdomen. This seemed to be connected with spasmodic contractions of the intestinal canal, which enclosed portions of air, and also with spasms of the abdominal muscles. There was sickness and distension of the stomach, more especially after eating, and the food likewise sometimes occasioned a sense of weight in that organ. He had a disposition to purging; made but little water; and became at length dropsical. His pulse was commonly about eighty. In some cases related in books, I find that patients with abscesses in the pancreas have commonly complained of pain in the back and loins, but they seem to have had no peculiar symptoms.

When the Pancreas becomes harder than in its healthy state, it is often, I believe, not attended with any well-defined painful sensations to the patient. But it sometimes happens, although rarely, that the pancreas becomes much enlarged in its size, as well as hard in its structure, undergoing those changes which belong to scirrhus. In such cases sickness, and a long continued pain, has been remarked to exist in the epigastric region. In one instance, of which I have heard an account, besides the symptoms already mentioned, there was a pain in the hips, and sense of numbness in one thigh and leg.

I am not acquainted with the Symptoms which are produced by the formation of Calculi in the Pancreas. If the calculi should happen to be smooth and few in number, they would probably occasion little pain or inconvenience. But if they should be rough upon their surface and numerous, they would probably produce a good deal of irritation and pain in the pancreas, together with sickness and vomiting; but it is not likely that we should be able to guess at the cause of the irritation, unless some of the calculi, having passed into the duodenum, should be evacuated by vomiting, or by stool.

CHAP. XIII.

DISEASED APPEARANCES OF THE KIDNEYS AND THE RENAL CAPSULES.

Capsule of the Kidneys Inflamed.

I DO not recollect to have seen the proper Capsule of the Kidney inflamed, and I am disposed to consider it as a rare morbid appearance. The reason, probably, why it seldom occurs, is that the peritonæum reflected upon the surface of the kidney has a very loose connection with it, there being interposed between them a considerable quantity of cellular membrane and fat. It seems very likely that the principal cause why the capsules of some other glands in the abdomen are so frequently inflamed, is their close connection with the peritonæum; which membrane, from circumstances it is perhaps difficult to ascertain, is very liable to inflammation. When the capsule of the kidneys is inflamed, the same appearances of inflammation will take place, which have been so often noted.

Abscesses of the Kidneys.

WHEN the substance of the Kidney is inflamed, it frequently advances to Suppuration, and perhaps there is no considerable gland in the body so liable to form abscesses as the kidneys. In some cases which I have seen, the abscesses have appeared to be of a common

nature; but in the greater number of cases, they have been scrofulous.

When a kidney is attacked with scrofula, and the disease has advanced to suppuration, it exhibits different appearances, according to the progress it has made. Sometimes there are only one or two circumscribed abscesses, containing a curdy pus, without any thing being particularly observable in the inner surface of the abscesses. Frequently, however, the inner surface of the abscesses is lined with a pulpy matter. These abscesses generally first destroy the mammillary portion of the kidney; and when they advance very far, they destroy almost the whole of its structure, converting it into capsules which surround a number of imperfect cavities lined with this pulpy substance.

The capsule into which a kidney is changed by the progress of this disease is in some cases thicker than in others, frequently of considerable hardness, and seems sometimes to be slightly laminated. When a kidney is so affected, it is not uncommon for the pelvis and ureter to partake of the disease, and a calculus is sometimes found either in the abscess, or in the pelvis of the ureter. In some cases of this kind, a considerable number of calculi have been found.*

Scrofulous Tubercles in the Kidneys.

It is not unusual, as already stated, for scrofulous abscesses to take place in the kidneys, but it occurs

* In such cases, it is very probable that the Calculus or calculi are the immediate cause of the other disease, the constitution being at the same time disposed to it. By the irritation of the calculi, inflammation and suppuration are produced in the kidney, and these partake of the nature of the constitution.

very rarely that scrofulous tubercles are formed in them. I have seen, however, an instance of this kind, and the tubercles resembled most exactly the common tubercles of the lungs. None of them were in a state of suppuration.

Scirrhus of the Kidney.

I HAVE once seen the kidney converted into a hard, uniform substance, somewhat intersected by membrane, in which the natural structure of this gland was entirely lost. The kidney was at the same time very much enlarged in its size. This alteration of structure I should call scirrhus, because it exactly resembles scirrhus in other parts of the body: it occurs very rarely in the kidneys.

State of the Kidneys in Diabetes.

OPPORTUNITIES do not frequently occur of examining the state of the Kidneys in Diabetes. I have once, however, been able to make this examination in a satisfactory manner, where a person had been long affected with diabetes, and had been a patient under my care in St. George's Hospital. In both kidneys the superficial veins were much fuller than usual, forming a most beautiful network of vessels. The whole substance of the kidneys was much more vascular than in a healthy state, approaching a good deal in appearance to what takes place in inflammation. In both of them there was a very small quantity of a whitish fluid, somewhat resembling pus: but there was no appearance of ulceration whatever. The artery, the vein, the lymphatic vessels,

and the nerves of both kidneys, were in their natural state. The liver, at the same time, I examined with care, because it has been thought by some to be the chief source of disease in diabetic patients, but it was perfectly sound. The stomach and intestines were also examined with attention, but no appearances occurred in them which are not very common.

Kidneys very Soft.

I HAVE also seen the substance of the Kidney converted into a soft loose mass, resembling almost exactly the appearance of common sponge. On the surface there were many round interstitial cavities scattered at irregular distances; and when the substance of the kidney was cut into, it exhibited the same spongy structure. The blood-vessels of the kidney were seen ramifying very distinctly through the spongy mass. There was no appearance of pus in the kidney, nor was there the most distant resemblance between this process and the effects produced by suppuration. It was a process of a peculiar kind, by which a considerable portion of the kidney was removed by the action, probably, of absorbent vessels, and it seemed to act much more on the cortical than on the tubular part of it. I am not at all exaggerating the effect of this diseased process when I say, that the kidney was rendered fully as soft as a common sponge. When shaken in water, the parts all separated from each other, somewhat like the unravelling of the shaggy vessels of the placenta. Such an appearance of kidney, but in a much smaller degree, has fallen two or three times under my own observation.*

* It is extremely probable that the disease here described by Dr. Baillie is what is now denominated Fungus Hæmatodes. (*Ed.*)

Hydatids of the Kidneys.

THE formation of Hydatids is not an uncommon disease in the Kidneys. There are sometimes one or two considerable hydatids on the surface of the kidney, lying between its substance and capsule; at other times, they are more numerous. These hydatids do not appear to be of the same nature with hydatids of the liver: they are not enclosed in firm cysts; their coats are also thinner, and less pulpy; and not uncommonly they are almost as thin as any membrane of the body. I do not recollect to have seen any instance of small hydatids of this sort attached to the coats of larger hydatids in the kidney, as may be frequently observed in the liver. It is, therefore, probable, that the hydatids which are commonly found in the kidney, depend on a diseased alteration of the structure of this organ, and are not distinct organised simple animals.

Sometimes, however, the true hydatid is formed in the kidneys, having exactly the same nature with that which grows in the liver. I have particularly examined a case of this kind after death, and I shall describe what came under my observation. The right kidney, in a soldier, was converted into a bag capable of containing at least three pints of fluid, and only a very small part of the kidney at the lower end retained its natural structure. The bag was of considerable thickness, was obscurely laminated, and had a cartilaginous hardness on its inner surface. It was full of hydatids, which differed very much from each other in their size, some of them being as large as a small orange, and others not larger than the head of a pin. Some of the small hydatids were lodged in little cavities formed in

the inner surface of the bag. Their coats were in general easily separable into two laminæ, and varied a good deal in thickness in different hydatids. This difference made one hydatid look opaque, while another was transparent. Even in the same hydatid there was often a difference in the opacity, or transparency of its coat at different parts. Some hydatids had, adhering to their inner surface, a cluster of small hydatids, which looked like small pearls; others had hydatids even of a considerable size floating loose in their cavity; and others contained only a fluid. The fluid in many was transparent, but in some hydatids it resembled whey. Some of the small hydatids had frequently been passed along with the urine, when the person was alive. It required an increased exertion of the muscular power of the bladder to drive them through the urethra; and the bladder, by this exertion, had acquired a stronger muscular coat, as in other cases of obstruction to the free passage of the urine.

Calculi of the Kidneys.

The formation of Calculi is not peculiar to the Kidneys, but it is a more frequent disease in them than in any other part of the body. Small granules of stone are sometimes found in the tubular portion of the kidneys; but it is more common to find a calculus of considerable size lodged either in some part of the substance of the kidney, or in the pelvis of the ureter.

The last situation is by much the most frequent. When a stone in its situation is so large as not to be capable of passing through the ureter, it is afterwards gradually increased in size, from the contact of the

urine. In its growth, it necessarily follows the branches of the pelvis, which are called infundibula, and is therefore of an arborescent form. Such calculi vary in their colour and surface; they are sometimes of a light brown, sometimes of a dark brown, and sometimes of a white colour. They are also sometimes smooth, and sometimes a little roughened on their surface. Of the nature of urinary calculi I shall speak afterwards, when I come to take notice of the diseased appearances of the bladder. When a stone in the pelvis of the ureter has increased to a very considerable size, it almost entirely prevents the urine from passing into the ureter. The urine is therefore accumulated in the pelvis above the stone, and hence enlarges the pelvis very much, as well as the cavity in the kidney itself. From the pressure, too, of the urine behind the stone, the pelvis of the ureter, besides being enlarged, is thrust out from the substance of the kidney. If the interruption to the passage of the urine from the kidney arises from some obstruction in the lower extremity of the ureter, or at the neck of the bladder, or in any part of the urethra, not only the pelvis of the ureter is then enlarged, but the ureter itself. I have seen the ureters of both kidneys enlarged from this cause to twice or thrice their natural size.

Whatever be the nature of the obstruction, if the pelvis of the ureter be very much enlarged from the accumulation of urine, the cavity of the kidney is at the same time enlarged. As this process advances, the substance of the kidney becomes more and more compressed, is gradually absorbed, and its cavity becomes enlarged in proportion. The substance of the kidney is, at length, in a great measure lost, and is

converted into a capsule, containing a great many cells, which communicate with each other. The capsule is sometimes very thin, and the whole mass a great deal larger than the natural size of a healthy kidney. It is worthy of remark, that the urine is secreted even when the natural structure of the kidney is almost entirely lost. This is seen both in the derangement of the kidneys now under consideration, and when they are converted into a mass of hydatids. It would appear from this fact, that a very small portion of the natural structure of the kidneys is capable of separating very nearly the ordinary quantity of urine.

Kidneys Earthy and Bony.

The Kidneys have been said to be converted into an earthy substance.* A kidney has also been known to become ossified.† Such appearances have never come under my own observation, and I am persuaded are extremely rare.

Original Varieties in the Kidneys.

The Kidneys are subject to a good deal of variety in their natural circumstances, from original formation. The two kidneys are sometimes found to be joined together: they are sometimes situated before the lumbar vertebræ, and sometimes on the sides of the pelvis. They are occasionally very small, and the kidney on one side is sometimes wanting; when this

* Vid. Lieutaud, tom. i. p. 282.

† See Medical Communications, vol. i. p. 416.

is the case, the size of the other kidney is larger than ordinary.

It is very difficult to assign a satisfactory reason why there should be such variety in the kidneys; but we can see that there is little disadvantage to the animal functions produced by this variety.

The kidneys are not large, and therefore may be changed in their situation without any sensible inconvenience. As their function is independent of relative situation, it must be precisely the same, wherever the kidneys are placed.

When the kidneys are small, the secretion of the urine may be very nearly in the common quantity, from a greater activity in carrying on their function; or such persons may be disposed to sweat more than usual, to counterbalance the deficiency of the urine. We know very well that the secretions of the sweat and of the urine are vicarious. When a kidney is wanting, the other being of a large size is probably capable of doing the office of two kidneys.

Diseased Appearances of the Renal Capsules.

The Renal Capsules are scarcely ever found diseased. The dark coloured substance in their centre, which, naturally, has some consistence, is occasionally very soft, so as almost to be fluid. This is probably what is meant by authors, when they say that they have found in the cavity of the renal capsules a fluid like ink. Their description may be considered as being a little exaggerated.

Abscesses in the Renal Capsules.

The Renal Capsules are very seldom attacked with inflammation, and therefore Abscesses have very rarely occurred in them. There is much variety in the different parts of the body, with regard to their susceptibility of being excited to inflammation. A few cases of abscesses in the renal capsules are related by authors.

Renal Capsule Scrofulous.

It has occurred to me to see only one instance of Scrofula in the Renal Capsules. In this case, the renal capsule affected by it was very much enlarged in size, being nearly as large as a kidney, and was changed into the same kind of white matter, which is observable in a scrofulous absorbent gland.

The renal capsules have also been changed into a cartilaginous substance, but this morbid appearance occurs very rarely.*

Little granules of Stone have been found in the substance of the renal capsules.†

SYMPTOMS.

When the Kidneys are inflamed, more or less pain is felt in the situation of these glands, and the pain commonly shoots along the couse of the ureters. There is a sense of numbness in the thigh, and in the male there is often a retraction of the testicle, or a feeling of pain in it. When one kidney is affected, these

* See Soemmerring's Translation, p. 170.

† Vid. Lieutaud, tom. i. p. 286.

symptoms are only felt on that side. The urine is voided frequently, and is sometimes of a pale, but more commonly of a deep red colour. The stomach sympathises with this state of the kidneys, for it is affected with sickness and vomiting: the bowels are at the same time often costive, and subject to colicky pains. These sensations are accompanied with more or less symptomatic fever.

When pus is formed during the progress of the inflammation, it may be known by its being mixed with the urine; and this will be more distinctly marked in proportion to the quantity of the pus.

The Symptoms which belong to a Scirrhous state of the Kidneys are unknown to me, and I do not find that they are distinctly marked by authors.

There would seem to be no particular Symptoms which belong to the formation of Hydatids in the Kidneys. Pain is commonly felt in the loins during their formation; there has also been remarked symptomatic fever, nausea, and vomiting: but these symptoms belong also to some other diseases. This disease, therefore, can only be ascertained by hydatids passing occasionally through the urethra along with the urine. In such cases there must sometimes be a difficulty in making water, from an hydatid interrupting the passage of the urine, either at the neck of the bladder, or in some part of the urethra.

The Symptoms which are produced by Calculi irritating the Kidneys correspond very much with the symptoms attending the inflammation of these organs.

The irritation from calculi, however, may be distinguished from simple inflammation of the kidneys, by the additional symptoms, of red crystals being often deposited from the urine as soon as it is voided, by blood being sometimes mixed with the urine, and by the pain of the loins being much increased on any jolting motion of the body.

Diabetes is distinguished by the urine being much increased beyond the natural quantity, by its being more or less sweet to the taste, and of a colour somewhat resembling whey. There is great thirst, and often, although not always, a voracious appetite for food. The pulse is commonly not quicker than natural, and the body becomes at length much emaciated.

CHAP. XIV.

DISEASED APPEARANCES OF THE URINARY BLADDER.

Inflammation of the Peritonæal Covering of the Bladder.

THAT portion of the Peritonæum, which covers the fundus of the Bladder, is not very often inflamed by itself, but it partakes of the inflammation which extends over this membrane generally. The appearances accompanying its inflammation have been already described. Inflammation of the peritonæal covering of the bladder does not frequently extend to its muscular coat. The peritonæum and the muscular coat of the bladder are but loosely connected together, as a considerable quantity of cellular membrane is interposed between them. This loose connection is necessary, in order that the peritonæum may be accommodated to the different states of distention of the bladder; and it has also the effect of preventing inflammation from spreading readily from the peritonæal covering of the bladder to its muscular coat. When the inflammation subsides, adhesions are frequently left behind, connecting the bladder more or less to the neighbouring parts; in a female, to the uterus; and in a male, to the rectum.

Inflammation of the Mucous Membrane of the Urinary Bladder.

The Mucous Membrane of the Bladder is occasionally inflamed. When this happens, the Inflammation is sometimes extended over the whole cavity, or is sometimes confined to a particular portion. The portion which is most frequently inflamed is that near the neck of the bladder. This may arise from two causes; the one is, that in this situation, or near it, some obstruction is frequently found to the passage of the urine, which may produce irritation, and bring on more or less inflammation; the other is, that inflammations of the urethra occasionally extend some way within the cavity of the bladder, and even sometimes over the whole of it. It is well known that the mucous membrane of the bladder, in the dead body, hardly shows vessels large enough to carry red blood in its natural state: but when it is inflamed, it is crowded with a prodigious number of extremely fine blood-vessels, and there may even be sometimes seen small spots of extravasated blood. When the inflammation is in a high degree, the muscular coat of the bladder may be affected; but as this is only loosely attached to the mucous membrane, the inflammation will not very readily pass from the one to the other.

Ulcers of the Urinary Bladder.

Inflammation of the Mucous Membrane of the Bladder advances sometimes to the formation of pus, and abscesses and Ulcers are occasionally produced. These, when the inflammation has been simple, exhibit

the ordinary appearances which have often been described. They sometimes advance so far as to destroy a portion of the bladder entirely, and to form communications between it and the neighbouring parts; as with the general cavity of the abdomen, with the rectum in the male, and the vagina in the female. When the communication is formed with the general cavity of the abdomen, the urine escapes into it, producing general peritonæal inflammation, of which I recollect a very striking example. When the communication is formed with the vagina or the rectum, the urine will escape by these passages, producing in them more or less irritation and inflammation.

When abscesses take place in the bladder, they are produced more frequently from local violence, than from a previous spontaneous inflammation. One of the most common causes of violence is the incision of the bladder in the operation of lithotomy. When the part has been very much irritated in the operation, or the constitution is such as to be excited to violent action by the common degree of irritation, an ulcer is formed at the lips of the wound, and spreads more or less into the cavity of the bladder.

It sometimes happens, although I believe very rarely, that the whole of the mucous membrane of the bladder is destroyed by ulceration, and its muscular fibres appear as bare as if they had been nicely dissected. In the case where I recollect this process to have taken place most completely, the bladder was almost filled with a scrofulous pus: there was a curdy white matter mixed with pus, which had exactly the same appearance with that formed by the suppuration of a scrofulous absorbent gland.

Scirrhus and Cancer of the Urinary Bladder.

From the contiguity of the Bladder to parts which are very liable to Scirrhus or Cancer, it sometimes partakes of this disease; but I do not think that it is often separately affected by it. The disease on some occasions spreads to the bladder from the rectum, and on others from the uterus; under such circumstances the bladder becomes very thick and hard, and exhibits the ordinary scirrhous structure. Communications, too, are generally formed either with the rectum, the uterus, or the vagina.

I believe, however, that the bladder has sometimes been primarily affected with scirrhus and cancer, and that scirrhous tumors have been formed in its cavity; but, as I have stated above, these morbid appearances are very rare.*

Fungous Excrescences of the Urinary Bladder.

Sometimes fungous Excrescences arise from the mucous surface of the Bladder, either in one mass or in separate portions. On examination they are found to consist of a loose fibrous structure. When they are situated a little behind the neck of the bladder, which is commonly the case, they must produce a considerable obstruction to the passage of the urine. A stronger action will, therefore, be required in the bladder to expel the urine, and its muscular coat will be consequently thickened. Accordingly it is often found thickened in these cases; and it is not improbable that even where the situation of the fungus may

* Vid. Portal's Anatomie Médicale, tom. v. pp. 409, 410.

not obstruct the passage of the urine into the urethra, its presence may still irritate the bladder, so as to excite it to more frequent and stronger actions than in a natural state, and the muscular coat may become thereby more or less thickened.

Polypus of the Urinary Bladder.

A Polypus sometimes grows from the mucous surface of the Bladder; but this morbid appearance occurs very rarely. I have only seen one example of it, and in this instance it filled up the greater part of the cavity of the bladder. It was very irregular in its shape, consisting of various projecting masses, and seemed pretty firm in its texture.

Fungus Hæmatodes of the Urinary Bladder. (Ed.)

Since my book on Fungus Hæmatodes was published, I have met with a few cases where distinct Hæmatoid tumors were found in the urinary bladder. The internal structure of these tumors was medullary, and externally they had a flocculent appearance. The bladder, after death, was filled with grumous blood; and in one case hæmatoid tubercles were found in the Lungs.

Elongations of the Mucous Membrane of the Urinary Bladder.

I have known the Mucous Membrane of the Bladder elongated in some parts, so as to form irregular processes. These, when cut into, were found to consist of a considerable quantity of cellular membrane, inter-

mixed with a little fat. The process producing such an appearance was probably a slow one, and not attended with pain. If these elongations were to be situated at a distance from the neck of the bladder, they would probably not produce any inconvenience; but if situated near the neck of the bladder, they might occasion extreme difficulty in making water, and even lay the foundation of a fatal disease.

Veins of the Mucous Membrane of the Urinary Bladder Enlarged, and Varicose.

Some instances have occurred in which the Veins of the Mucous Membrane of the Bladder have become enlarged and varicose, similar to the enlargement of the veins of the lower part of the rectum, in piles. This will be most apt to happen where there has been a considerable impediment to the return of the blood by the veins of the bladder, as in cases where the absorbent glands, on the sides of the cavity of the pelvis, have become much enlarged, or where any tumor has been formed within the pelvis, which has a good deal compressed these veins.*

Cysts communicating with the Urinary Bladder.

Cysts are sometimes found connected very intimately with the Bladder, and communicating with its cavity. These in some instances have been observed to be of a large size, being perhaps half as large as the usual size of the bladder itself. There is some difficulty in explaining the manner in which they are

* Vid. Portal's Anatomie Médicale, tom. v. p. 411.

formed. If we suppose them to be formed in the cellular membrane, on the outside of the bladder, it is extremely difficult to explain how they should communicate with its cavity, unless by ulceration, which does not take place. If we suppose them to be pouches from the bladder itself, it is still difficult, in some instances, to explain why they should be found at all, and why they should attain so large a size. The supposition, however, of their being pouches seems to be the most reasonable; and I am persuaded it will apply to the greater number of cases where such cysts exist.

Muscular Coat of the Urinary Bladder Thickened.

One of the most ordinary changes in the Bladder, from its natural structure, is the great thickening of its muscular coat; this, in a natural state of the bladder, when it is moderately distended, consists of thin layers of muscular fibres running in different directions. These are probably, altogether, not more than the eighth of an inch in thickness. The muscular coat of the bladder, however, is occasionally found at least half an inch thick. This arises from an additional quantity of muscle being formed in consequence of extraordinary efforts being necessary in the bladder. These efforts take place when there is any considerable difficulty in making water, as happens when the prostate gland is a good deal enlarged, when there is a stone in the bladder, or when there are strictures in the urethra. It is usual, therefore, to find this thickening of the muscular coat of the bladder when there is any of these diseases. When the bladder is thickened,

the fasciculi of which its muscular coat is composed, become much larger; but never, or at least very seldom, acquire the full red colour which muscles of the same size have in other parts of the body. This is a deviation from the general law of nature with regard to the increase of muscles from exercise. When muscles are enlarged in size from exercise, they also become of a deep red colour. There is no other instance in the body, as far as I recollect, of a muscle being so much enlarged beyond its natural size, in consequence of increased exertion, as the muscular coat of the bladder.

Between the fasciculi of the muscular fibres, little pouches are formed by the mucous membrane. This arises from the pressure of the urine against the mucous membrane of the bladder, which is impelled by the strong powers of the muscular coat. These pouches are often large enough to admit the end of the finger, and contain occasionally small calculi. The bladder in this state admits of very little distention, and is therefore incapable of containing much water: hence the inclination to make water is frequent, and frequent efforts of the muscular coat are required, which increase more and more its thickness. It is much more common to find this appearance of the bladder in the male than in the female, because in the latter there are fewer causes to produce it; since in that sex there is a want of the prostate gland altogether, and the urethra being short and wide, obstructions seldom take place in it. When the muscular coat of the bladder has been thickened, I believe that it has been sometimes mistaken for scirrhus.

The Urinary Bladder Divided into two Chambers.

THE Bladder has sometimes been found to be divided into two chambers, which communicate with each other; but this has happened very rarely. I have not had an opportunity myself of examining this singular disease, but I have received an account of such a case from Dr. Ash, which had many years ago fallen under his observation. The upper chamber of the bladder in this case was generally much distended with urine, so that a round tumor could be easily distinguished by the touch above the pubes. When a catheter was introduced into the bladder, a few ounces only of urine came away, and the tumor above the pubes remained the same as before. When the patient stood up, a quart of water sometimes passed away involuntarily, the tumor very much subsided, and the complaint was relieved for the time. After the death of the patient, the bladder was found upon examination to be divided into two chambers by a firm membranous substance, and the aperture of communication was almost obliterated.

There seem to me to be only two ways in which a division of the bladder into two chambers can happen. The one is by a morbid growth of the mucous membrane, forming a ridge at some particular part, and at length by a continuation of this process, making a septum more or less complete in the bladder. I have seen the cavity of the œsophagus very much narrowed at one part by a permanent ridge being formed in its mucous membrane. Something of the same kind I have also seen in a part of the small intestines. We may therefore readily admit the possibility of a similar

process taking place in the mucous membrane of the bladder.

Another way in which the bladder may be supposed liable to be divided into two chambers, is by a very strong contraction of its transverse muscular fibres at some particular part. This will be analogous to the hour-glass contraction of the uterus, which is known occasionally to take place. When a complaint of the bladder depending on its being divided into two chambers has been temporary, it is reasonable to suppose that it has arisen from the last cause; when it has been permanent, it is more likely to have arisen from the first.

Calculi of the Urinary Bladder.

Calculi are not uncommonly found in the Bladder, and are confined in their formation to no particular period of life. They are formed in very young children, and also in persons of middle and advanced age. This disease is not so frequently met with in the female as in the male, which may depend on two causes: the one is, that there is not so strong a tendency to their formation in that sex; and the other cause is, that stones escape through the urethra in women, which would be detained in the bladder of men, and lay the foundation there of larger calculi.

The stones which are found in the bladder are either originally formed in the kidneys, and pass through the ureters into the bladder, or they are first formed in the bladder itself. When the latter takes place, the earthy matter is sometimes first deposited round some extraneous body, which becomes the nucleus of the calculus, but most frequently no nucleus whatever is

to be observed. The nuclei which I have seen have been small portions of lead, probably broken off from a leaden bougie, small nails, and little masses of hair. In short, any extraneous body which may happen to be introduced into the bladder may become a nucleus. It is natural to think that such nuclei are more common in the calculi found in the bladder of women than of men, because their urethra is wider and shorter, so that an extraneous body can be much more easily introduced into their bladder.

The calculi of the bladder either lie loose in it, or are confined to some fixed situation from particular circumstances. When they are of a small size, they are sometimes lodged in pouches, or sacculi, formed by the protrusion of the mucous membrane of the bladder between the fasciculi of its muscular fibres. A calculus also is occasionally attached to an excrescence of the bladder, so as to be kept in a fixed situation.

There is frequently one calculus only in the bladder at a time, and then it is usually of an oval form; but there are often more, and the calculi by rubbing upon each other in a narrow space acquire flat sides and angles. Calculi have sometimes a smooth uniform surface, but most frequently the surface is granulated. These granules are commonly placed very near each other over the whole surface of the calculus, giving it a certain degree of roughness. They are, however, occasionally gathered into clusters on particular parts of the surface of a calculus. They are sometimes of a smaller, and sometimes of a larger size, and in different calculi are more or less elevated. Some calculi have an irregular porous structure on the surface, instead of being granulated.

Calculi, when divided by the saw, or when broken, exhibit most commonly a laminated structure. The laminæ are disposed in concentric curves, and are applied together with more or less compactness: in some calculi the laminæ adhere together very slightly. They differ in their thickness in different calculi: and the laminated structure sometimes pervades uniformly the whole mass of the calculus; while at other times different portions of it are interrupted by a coarse porous texture. In some calculi no laminated structure whatever is observable, but an entire porous one.

The colour of calculi varies considerably. They are most frequently of a brown colour, which is sometimes of a lighter and sometimes of a darker shade. They are also sometimes of a white, and often of a yellowish colour. It is remarkable, that different portions of the same calculus are frequently of a different colour. Some laminæ, for instance, are perfectly white, while the other laminæ are brown. In this sort of mixture, I have most commonly found the white laminæ on the outside, and the brown laminæ in the middle; but this distribution probably varies in different calculi.

The specific gravity of urinary calculi differs very considerably, as they vary a good deal in compactness; but they are in general nearly twice the specific gravity of water.

It is only within a few years that the chemical analysis of urinary calculi has been made with sufficient accuracy, and they have been found to consist of seven species, very different from each other.

The first species is more common than the others, and consists of a particular acid called lithic acid, mixed with some gelatinous matter, and in some in-

stances with a very small proportion of lime. Its texture is partly laminated and partly porous. Its colour is brown, varying a good deal in the depth of its shade, and sometimes with a very slight yellowish tinge. The chemical properties of this species of urinary calculi were first ascertained by Scheele and Bergman.

The second species is the triple phosphate, which consists of the union of phosphoric acid with magnesia and ammonia. It has externally a sparkling crystalline appearance, and hardly ever occurs in a pure state; but this triple salt often enters into the composition of other calculi, and more especially into that which is called the fusible calculus.*

The third species consists of crystals which are formed by the combination of phosphoric acid with magnesia and ammonia: these are mixed with some phosphorated lime, and generally with some lithic acid. It is of a white colour, is more irregular in its shape than some of the other species, and consists partly of a laminated and partly of a porous structure. It is fusible by the blow-pipe, and hence has commonly been called the fusible calculus.

The fourth species consists of the acid of sugar and the acid of phosphorus united with lime; together generally with some lithic acid in the interstices. This species is knotted on its outer surface somewhat like a mulberry, and from this circumstance it has commonly been called the mulberry calculus. It is of a dark brown colour, and consists of an irregularly laminated structure. The laminæ of which it is com-

* See Dr. Marcet's excellent Essay on Calculous Disorders.

posed often vary in their colour, some of them being dark, and others of a white colour. The white laminæ are commonly towards the outer part of the calculus, although its colour be dark.

The fifth species consists entirely of phosphorated lime, and has been called the bone-earth calculus. It is of a light brown colour, and its laminæ slightly adhere to each other. For an accurate analysis of these three last species of urinary calculi, we are chiefly indebted to Dr. Wm. Hyde Wollaston.

The sixth species consists of carbonate of lime, mixed with a little animal matter and water, and was discovered lately by Mr. Crumpton.*

A seventh species of calculus has lately been discovered by Dr. Wm. Hyde Wollaston. He has only met with two instances of it, and therefore it must be considered as very rare. It resembles the calculus containing the triple phosphate of magnesia: its substance is not distinctly laminated, but appears rather like a mass confusedly crystallised. This species of calculus readily unites with acids and alkalies, contains a small proportion of oxygen, and appears to be an oxide of a peculiar kind. Dr. Wollaston has given it the name of the cystic oxide.†

Not unfrequently a calculus consists of some of the different species above described, arranged in alternate strata; and sometimes it consists of the ingredients of different species of calculi combined together without, or with very little, distinct appearances of stratification.‡

* See Thompson's System of Chemistry, vol. iv. p. 671.

† See Philosophical Transactions, Part II. 1810.

‡ See Dr. Marcet's Essay on Calculous Disorders, pp. 88—90.

The matter of calculus in the bladder is generally formed into one or more circumscribed masses, yet it sometimes happens the whole bladder is filled with a substance like mortar. Of this I recollect one striking example: the earthy matter in this case could not be entirely removed from the bladder, but a great many small irregular portions still adhered to the sides of its cavity. Within the last three years I have met with another instance in which the matter of calculus put on the appearance and consistence of mortar, but was in small quantity. It was connected with a chronic inflammation of the mucous membrane of the bladder, and processes of coagulable lymph attached to the mucous membrane were incrusted with the calculous matter. This disease had continued for many years, and was combined with stricture of the urethra.

Urinary Bladder Distended.

In opening dead bodies, the Bladder is occasionally found to be very much distended, and to occupy the lower part of the cavity of the abdomen. This might arise from some accidental circumstance of the water being accumulated while the muscular coat of the bladder still possessed its proper powers; or the muscular coat of the bladder may have been paralytic, and therefore not capable of expelling the water. I do not think it is possible to discriminate between these two different cases by any examination after death, but they can always be ascertained by a careful enquiry into their history.

Urinary Bladder Contracted.

The Bladder is also found contracted to such a degree as hardly to have any cavity. This is some-

times not to be considered as a disease, but simply as having arisen from a very strong action of the muscular coat of the bladder previously to death.

Not unfrequently when the mucous membrane of the bladder has been long in an irritable state, the muscular part of it, from the habit of contracting upon small quantities of urine, loses the power of being distended, and remains more or less permanently contracted.

The Anterior Portion of the Urinary Bladder Wanting.

The anterior part of the Bladder is occasionally wanting, and instead of it there is a very soft vascular flesh, situated externally at the lower part of the abdomen. This soft vascular flesh is usually formed into irregular projecting masses, and in the living body is covered with a thick ropy mucus. The two ureters open somewhere on this vascular flesh, distilling gradually the urine upon its surface, which the mucus is intended to protect against the stimulus of that fluid. When there is such a formation of the bladder, I believe that there is always a deficiency of bone at the symphysis pubis, and also a malformation of some of the organs of generation. This species of monstrosity I have described at large in the Medical and Chirurgical Transactions.

The Urinary Bladder and the Rectum communicating, from Malformation.

Another kind of malformation of the bladder occasionally happens, viz. that at its depending part there

is a communication between it and the rectum, the latter being continued into the former. Of this I have seen one instance; and it has already been taken notice of, when treating of the diseased and præternatural appearances of the intestines.*

Hernia of the Urinary Bladder.

The Bladder, or a portion of it, has been known to protrude through the abdominal ring, or under Poupart's ligament. As the anterior part of the bladder, which has no peritonæal covering, protrudes first, the Hernia is not contained in a hernial sac. If the hernia be large, the bladder drags down a portion of peritonæum, forming a true hernial sac above it, but still the bladder is on the outside of the sac. †

SYMPTOMS.

In Inflammation of the Bladder, a pain is felt in the perinæum, or above the pubes, accompanied with fulness or swelling. There are frequent attempts to make water, which is evacuated in small quantity and with great pain; or there is a total retention of the urine, with a strong desire to void it. The rectum is affected from its contiguity with the bladder, and is excited to tenesmus. The stomach likewise takes a part in the disease, and the patient is affected with sickness and vomiting. In some cases there is delirium. When pus has been formed in consequence of the inflammation, it is known by being mixed with the urine which is evacuated.

* See p. 165. † See Pott on Ruptures, p. 226.

When the bladder has become affected by an ulcer spreading from the neighbouring parts, it may be suspected by the pain and difficulty in making water. When the ulcer has made further progress, and a communication has thereby taken place between the bladder and the uterus, or between the bladder and the vagina, or between the bladder and the rectum, it may be distinguished by the urine passing either through the vagina or the anus, attended with pain and irritation; or by air, or by fæculent matter occasionally passing through the urethra.

When two Chambers are beginning to be formed in the Bladder, very little inconvenience is probably felt, because the communication between them at this period is very large. Under such circumstances, it seems hardly possible to detect the nature of the disease in the living body; but when the disease has made a considerable progress, and the communication between the two chambers has become very narrow, it may be ascertained, or at least conjectured with great probability, from the following circumstances. There will then be a considerable circumscribed tumor above the pubes in the situation of the bladder when distended, much less urine will be made than the natural quantity, and the tumor will not be sensibly lessened by it; or if a catheter be introduced, little urine will be evacuated, and the tumor above the pubes will still remain the same. But it will occasionally happen, by some particular attitude of the body, that the urine will pass from the upper chamber of the bladder into the lower, and from this it will be evacuated by the urethra; under such circumstances there will be a much larger

quantity of urine made than usual, the tumor above the pubes will disappear, and the patient will receive immediate relief, which will continue till there is another accumulation of urine.

The existence of Fungous Excrescences from the mucous surface of the Bladder, may probably be ascertained in some instances during life by the introduction of a catheter, but in general we cannot be certain of the real nature of the disease till the parts are examined after death. When the excrescence is situated near the neck of the bladder, there will be more or less difficulty of voiding the urine. In other instances the patient makes water at short intervals; and often feels the desire, and strains in order to make water, when there is little or none in the bladder. The urine is frequently tinged with blood. But these symptoms being common to this and other diseases, the symptoms alone do not furnish any certain marks by which the disease may be distinguished.

The Symptoms which belong to a Polypus formed in the Bladder are unknown to me; but they are probably much the same with those which attend fungous excrescences in the bladder.

The Symptoms which attend Calculi in the Bladder are well known. There is an uneasy sensation at the orifice of the urethra after making water, or after exercise. When the calculus is large, a dull pain is generally felt at the neck of the bladder. The attempts to make water are frequent, and the urine often passes drop by drop, or the stream is suddenly interrupted;

it also deposits a large proportion of a mucous sediment, which is produced by the mucous glands at the neck of the bladder being irritated by the calculus to an increased secretion. The urine is also occasionally tinged with blood, from some small blood-vessels being ruptured by a rough part of the stone, and this is most apt to happen after some jolting motion. There is tenesmus, in consequence of the connection of the rectum with the bladder, and the sympathy which has been established between their respective functions.

When the calculous matter is soft, resembling mortar, there is great pain and difficulty in making water, which is voided frequently, and in small quantity; portions of this matter are occasionally discharged, along with the urine, and generally mixed with a ropy mucus tinged with blood.

CHAP. XV.

DISEASED APPEARANCES OF THE VESICULÆ SEMINALES.

The diseased appearances of the Vesiculæ Seminales are but little known, because, from their situation, these bodies cannot be seen without a good deal of dissection; whereas many of the viscera come immediately into view when the cavity in which they are lodged is simply laid open: diseased appearances, however, have been occasionally observed in the vesiculæ seminales.

Vesiculæ Seminales Inflamed.

It has never occurred to me to observe the Vesiculæ Seminales alone inflamed, although they are, doubtless, liable to this disease, like other parts of the body. I have seen them, however, involved in the natural consequences of inflammation with the surrounding parts. Thus I have seen the posterior surface of the bladder, the vesiculæ seminales, and a portion of the rectum, adhering with unusual firmness together, in the same manner as other parts of the body do after inflammation. Some few instances, however, have occurred, in which so great an inflammation had been excited in the vesiculæ seminales, as to terminate in suppuration.*

* See Soemmerring's Translation, p. 194.

Vesiculæ Seminales Scrofulous.

The Vesiculæ Seminales are also affected with Scrofula. I recollect to have seen one of the vesiculæ seminales filled with true scrofulous matter, the distinguishing characteristic of which has been often mentioned.

Ducts of the Vesiculæ Seminales Terminating in a Cul-de-sac.

The Ducts of the Vesiculæ Seminales open naturally by two distinct orifices into the cavity of the prostate gland, but they are occasionally wanting, and the vesiculæ seminales terminate in a cul-de-sac. The vasa differentia are at the same time without their natural termination, for they end in the cul-de-sac of the vesiculæ seminales. This is a species of monstrosity which is very rare, but it is of great consequence, because it prevents the semen from passing into the urethra, and frustrates one of the most important functions in the animal economy. An instance of this sort of malformation is preserved in William Hunter's Museum.

Vesiculæ Seminales very Small.

The Vesiculæ Seminales differ a good deal in their size in different adult bodies, and indeed it is very common for the one to be considerably smaller than the other; but I have oftener than once seen both of them so small, that they must have been very little able to fulfil the intentions for which they were formed.

One of the Vesiculæ Seminales Wanting.

One of the Vesiculæ Seminales is occasionally wanting. Under such circumstances, I believe that the extremity of the vas deferens upon that side is generally enlarged and tortuous, becoming a sort of substitute for it. This was at least the case in the instance of this mode of formation which I have seen. The extremity of the vas deferens has at all times a structure similar to that of the vesiculæ seminales, and renders therefore this conjecture very probable.

Scirrhus of the Vesiculæ Seminales.

The Vesiculæ Seminales have also been observed to be scirrhous; but this is very uncommon.*

Small Stones have also been seen in the Vesiculæ Seminales, but they have not fallen under my own observation, and they are of very rare occurrence.†

SYMPTOMS.

The Symptoms which attend Diseases of the Vesiculæ Seminales, have not been attempted to be discriminated by authors, and must, from circumstances, be very difficult to ascertain. It has only occurred to myself to observe some diseased changes of them in the dead body; and I have had no opportunity of tracing the symptoms which accompany these changes during life.

* See Morgagni, epist. xlvi. art. 5.

† See Soemmerring's Germ. Translat. p. 193.

CHAP. XVI.

DISEASED APPEARANCES OF THE PROSTATE GLAND.

Abscesses in the Prostate Gland.

The Prostate Gland is not often found in a state of Inflammation. I have seen, however, an abscess in it, without any unusual thickening and enlargement of the gland, and where the pus appeared to be healthy. This must be considered as being a common abscess, and must have been preceded by the ordinary sort of inflammation.

Scrofula of the Prostate Gland.

The Prostate Gland is sometimes scrofulous. I have seen, on cutting into it, precisely the same white curdy matter, which is formed in a scrofulous absorbent gland. On squeezing it, I have also forced out from its ducts a scrofulous pus.

Scirrhus of the Prostate Gland.

The most common disease of the Prostate Gland is Scirrhus. The prostate gland, it is well known, is naturally about the the size of a large chestnut, but when it is affected with scirrhus, it is often enlarged to the size of the fist. In this enlarged state, when cut into, it exhibits a very solid, whitish, or brown sub-

stance, with membranous septa running through it in various directions, which are often very strongly marked. This is the common appearance of scirrhus in other parts of the body. When the prostate gland is a good deal enlarged, its cavity becomes deeper from the growth of its sides, and the posterior extremity forms a considerable projection into the cavity of the bladder, which interrupts the passage of the urine into the urethra.* According to the degree of this projection, the urine is passed with greater or less difficulty, as well as an instrument for drawing it off. When the projection is very great, it has sometimes been found impossible to pass an instrument over the projection, and an artificial passage has been made through it accidentally, by which the urine has been evacuated. Under such circumstances the gland has been known not to be irritated by the violence used in making this new passage, and life has been prolonged for a greater length of time than it would have been otherwise. Still, however, the instrument ought to be made to pass over the projection, if possible; and we should never run the risk, by injuring the gland, of bringing on immediately fatal consequences.

Sometimes in the progress of the enlargement the prostate gland grows irregularly, and a winding passage is formed through it, by an alteration in the shape of its cavity. This increases the difficulty of making water, and to the surgeon of introducing an instrument. When the prostate gland is enlarged, its internal sur-

* Sir Everard Home has discovered that this posterior projection is owing to the enlargement of a small separate lobule of the prostate gland, not hitherto known.

face is sometimes ulcerated, but commonly it is not.* Fistulous communications are sometimes formed between an enlarged prostate gland and the rectum. Both of these effects are generally produced by an incautious introduction of catheters or bougies.

It is obvious, too, from what has been mentioned, that, in an enlarged state of the prostate gland, the difficulty of making water must be very great. This difficulty excites extraordinary and very frequent efforts in the bladder to overcome it. Its muscular coat becomes consequently much stronger and thicker than in the natural state. A prostate gland, therefore, is never found enlarged to any considerable degree, without the bladder having undergone this change in its muscular coat. This disease is hardly ever to be found in a young person, but is not at all uncommon at an advanced period of life.

Calculi in the Ducts of the Prostate Gland.

THERE is another disease of the Prostate Gland, which occasionally takes place, although it is by no means so frequent as the former, viz. a formation of Calculi, which are lodged in its ducts. They are usually of the size of a small pea, and those which I have seen have been of a brown colour, which is lighter or darker in its shade. They have been found by Dr. Wm. Hyde

* Although I have given the name of Scirrhus to this affection of the prostate gland, from its hardness, and the similarity of its structure to that of scirrhus in some other glands, yet it would seem to be essentially different from it. This disease has little or no disposition to run into ulceration, and it is capable of subsiding, which would not be the case if it were a true scirrhus.

Wollaston to consist of phosphorated lime in the state of neutralisation.

The Ducts of the Prostate Gland Enlarged.

THE Prostate Gland is sometimes seen with its cavity very much widened, and its Ducts enlarged. In the natural state of the gland, the orifices of its ducts can hardly be seen, but they sometimes are so much enlarged, as to be capable of admitting a crow quill. When the ducts are thus enlarged, there is always a great obstruction to the passage of the urine through the urethra, arising most commonly from stricture: the urine, either passing in very small quantity, or being entirely prevented from passing, is accumulated in the cavity of the prostate gland and the bladder. The effect of this accumulation is, that the cavity of the prostate gland is widened, and the ducts very much enlarged. The bladder, too, from making extraordinary efforts to overcome the obstruction, has its muscular coat gradually thickened, and often to a considerable degree. With this state of the prostate gland there is therefore a thickened bladder, and an obstructed urethra.

The Prostate Gland preternaturally Small.

I HAVE also seen the Prostate Gland of an extremely small size, so that it could hardly be considered as being fit for its office. It was attended with a mal-formation of the urinary bladder and some of the organs of generation, and has been particularly described by me.

SYMPTOMS.

The Symptoms which attend Inflammation of the Prostate Gland have been little taken notice of by authors. It is reasonable to think, that there will be a sense of pain more or less acute at the neck of the bladder, with much difficulty in making water, or a complete obstruction to this evacuation, and probably tenesmus. This disease may be distinguished from a scirrhous enlargement of the prostate gland, by its quick progress, and by the pain which is felt in it.

When the Prostate Gland is affected with Scrofula, little inconvenience is probably felt in an early stage of the complaint; but if the gland should increase very considerably in size, those symptoms must necessarily arise which depend on its enlargement, and which are just about to be mentioned.

When the Prostate Gland becomes enlarged from Scirrhus, there is a difficulty in voiding the urine, and a small quantity only is discharged at a time, so that the bladder is kept always nearly full. There is sometimes a total inability to evacuate the urine. In some cases the fæces are passed with difficulty; and when the operation is over, there is still a feeling of something more to be discharged. The straining which attends the evacuation of the urine and the fæces not unfrequently forces out mucus, which had been secreted by the gland. A bougie or catheter is passed into the bladder with difficulty, and on some occasions is not capable of being passed at all.

Calculi occur so rarely in the Prostate Gland, that their Symptoms have been little taken notice of by authors. When the calculi are very small, so as to be confined entirely within the ducts of the prostate gland, it is probable that little inconvenience is produced by them. When they are larger, and form a projection into the cavity of the prostate gland, there must necessarily be difficulty in voiding the urine, and there will be the same feeling when a sound or catheter is attempted to be passed into the bladder, as if an urinary calculus had got fixed or impacted into the neck of the bladder.

CHAP. XVII.

DISEASED APPEARANCES OF THE URETHRA.

Abscess in the Urethra.

Abscesses are occasionally formed in the Membranous part of the Urethra. These may arise from an inflammation, produced by some latent cause, as abscesses are formed in any other part of the body; but they happen most frequently from an obstruction to the passage of urine through the urethra. This obstruction is produced generally by a stricture in some part of the canal, and most frequently it is at or near the bulb of the corpus spongiosum urethræ. The urine being forced by the efforts of the bladder behind the stricture, irritates that part, producing inflammation and suppuration; the abscess breaks externally, and the urine is evacuated by this opening.

Fistulæ of the Urethra.

While the obstruction in the Urethra continues, the opening made by the breaking of the abscess is not disposed to heal, but a fistulous orifice is gradually formed. This is surrounded with parts somewhat thickened and hard, as fistulæ are generally. The most common situation for these fistulous openings is behind the scrotum, because the most common situation of the stricture is at or near the bulb of the corpus spongiosum urethræ. Not uncommonly there are more

than one of these openings, leading to short canals which run in different directions.

Stone in the Cavity of the Membranous Part of the Urethra.

The cavity of the membranous part of the urethra I have seen distended into a bag large enough to contain a hen's egg. This bag was occasioned by a large stone having lodged there. The stone had probably been forced into the cavity of the membranous part of the urethra by the stream of urine, but was too large to pass through its whole length; it therefore stuck in that situation, and was gradually increased to the size described by the contact of the urine, similar to the growth of a stone in the pelvis of the ureters.

Cowper's Glands seldom observed to be Diseased.

I do not recollect to have seen Cowper's Glands diseased, which are situated near this part of the urethra. They are, doubtless, liable to changes from disease, like other parts of the body; but they are small and difficult of access, so that they have very seldom become an object of examination.

Morgagni mentions one of these glands being converted into a ligamentous substance*; and the excretory duct of one in another instance being obliterated.†

Mucous Membrane of the Urethra Inflamed.

The Mucous Membrane of the Urethra is very liable to be inflamed, particularly at its anterior extremity, and the inflammation occasionally spreads over the

* See Morgagni, epist. xliv. † Ib. art. 12.

whole extent of the canal. This exhibits no appearance different from the inflammation of membranes lining secretory canals which open externally. The membrane is much more crowded with small blood vessels than in a natural state, and there is an increased secretion of the glands which open on it. The inflammation is often not confined to the mucous membrane of the urethra, but spreads into the substance of the corpus spongiosum, affecting both its cellular structure and its glands. Under these circumstances the corpus spongiosum is enlarged and harder, from the extravasation of the coagulable lymph into its cells, and is more vascular than in a natural state. The glands, being increased in size from the inflammation, become sensible to the touch, like very small rounded tubercles.

Ulcers in the Urethra.

Ulcers are also seen occasionally on laying open the Urethra, but these are not frequent. This canal when inflamed has little disposition to ulcerate, as happens also to some other canals in the body, as, for example, the trachea.

Stricture of the Urethra.

The most ordinary diseased appearance of the Urethra is Stricture. This consists in a part of the canal being narrowed, or perhaps altogether obliterated. It may take place in any part of the canal, but it is most frequent at or near the bulb of the corpus spongiosum urethræ. This stricture sometimes consists simply of an approximation of the opposite sides of the canal, so as to form a line of obstruction; at other times the canal is narrowed for some length. The

mucous membrane at the stricture sometimes exhibits the natural appearance; sometimes it is a little thickened, and occasionally its surface is abraded or ulcerated. These two last effects are generally produced by bougies; and sometimes false passages have been made into the corpus spongiosum of the urethra, in consequence of employing too much violence in their use. There is often more than one stricture in the same urethra. It sometimes happens, too, that the stricture is more on one side of the canal than on the other, so that the passage there is crooked.

Caruncle of the Urethra.

A SMALL fleshy Excrescence sometimes grows in the Urethra. This is called a Caruncle, and used formerly to be considered as the most common cause of obstruction in this canal; but since dissections of dead bodies have become more frequent, it has been found in reality to be very rare.

Enlargement of the Mucous Glands of the Urethra.

NOT unfrequently one of the small Mucous Glands of the Urethra becomes enlarged and hard from inflammation, forming a tumor of the size of a pea, or larger, which projects towards the canal of the urethra, and narrows its diameter. This is usually the consequence of gonorrhœa, but it may arise from inflammation brought on by the improper use of bougies, or by any other cause.

A Layer of Earthy Matter in the Urethra.

I HAVE known one instance of a thin layer of earthy

matter extending from the bladder through the whole length of the urethra.

Preternatural Orifice of the Urethra.

The Urethra sometimes does not open at the projecting extremity of the glans penis, but under it, where the frænum is naturally situated ; and in such cases there is no frænum. The meatus consists of a small rounded opening, much less than the natural termination in the glans. I have known an instance in this structure of parts, of a canal being formed besides the urethra, about two inches in length, which terminated at one extremity in a cul-de-sac, and at the other opened on the glans, where the urethra commonly does. How far this variety may be frequent, I cannot pretend to determine. This deviation in the structure is not to be considered as a disease, but simply as a malformation of parts, and is not attended with any material inconvenience, as far as I know.

There are some other diseased appearances of the penis, such as ulcers, phymoses, paraphymoses, &c. These are external, are much more commonly met with in the living than in the dead body, and are very well known ; I shall, therefore, omit them entirely.

SYMPTOMS.

The Symptoms which attend Inflammation of the mucous membrane of the Urethra, are too well known to require being mentioned.

In Stricture of the Urethra there is difficulty in making water, which is greater or less according to the degree of the stricture ; the stream of urine is small,

sometimes forked, sometimes scattered, and sometimes the urine passes away in drops only. There is frequently also an increased secretion of mucus from the urethra, resembling a gleet. Various other symptoms may take place, in consequence of the parts in the neighbourhood of the stricture being affected; and even the constitution is sometimes much disturbed by this local irritation, exhibiting very different symptoms in different individuals.

When the Urethra is obstructed by the growth of a Caruncle, no symptoms are known by which it may be distinguished from a case of common stricture.

CHAP. XVIII.

DISEASED APPEARANCES OF THE TESTICLES, AND OF THE SPERMATIC CORD.

Hydrocele.

HYDROCELE, or a collection of water in the tunica vaginalis testis, is a very common disease, and is confined to no particular period of life. It is not unfrequent in very young children, and in them most commonly disappears without any surgical treatment. The bag in which the water is accumulated is of a pyramidal shape, and approaches more or less towards the ring of the abdominal muscle, according to the degree of accumulation. It sometimes extends almost to the ring itself. The bag is also more or less thick in different cases: it is often scarcely thicker than the tunica vaginalis in its natural state; sometimes, when the accumulation is large, it is three or four times as thick, and is obviously laminated. In such cases, too, the testicle is a good deal compressed, and has sometimes been known to waste in consequence of this compression. The fluid which is accumulated is of a yellowish, a greenish, or brown colour, and resembles in its properties the serum of the blood. This disease, in persons who are advanced in life, is sometimes combined with a scirrhous state of the testicle, which will be afterwards particularly described.

In almost all cases of hydrocele, the water is con-

tained in one bag, but in a few instances it has been known to be contained in several cysts. Of this I recollect a remarkable example. This variety is probably produced by repeated partial inflammations on the inner surface of the tunica vaginalis, and occasioning adhesions, which put on the appearance of cysts.

Hydatids.

HYDATIDS have sometimes been found in the cavity of the Tunica Vaginalis Testis, either loose or adhering; they are, I believe, not very uncommon, but I have had no favourable opportunity of examining them accurately.

Loose Cartilages in the Tunica Vaginalis Testis.

SMALL Cartilages are sometimes found loose in the cavity of the Tunica Vaginalis Testis, similar to those met with in some of the joints, more especially the knee joint. They do not, however, occur in the testicle so frequently as in joints. They must once have been attached to some part of the serous surface of the tunica vaginalis testis, by very small processes or peduncles; and by the motion of this tunic upon the testicle, they must have been separated. They afterwards continue to lie loose in the cavity of the tunica vaginalis testis, and are, I believe, attended with no inconvenience. An example of this kind has been seen by myself, and it has not unfrequently been observed by others.

Adhesions of the Testicle.

THE Tunica Vaginalis is frequently found adhering to the surface of the Testicle. The adhesion is some-

times extended over the whole surface, but frequently consists only of scattered processes of membrane. The adhesions are sometimes fine, but sometimes they have considerable thickness, and connect the tunica vaginalis to the body of the testicle more or less closely in different cases. They are produced by some previous inflammation in the tunica vaginalis testis, in like manner as adhesions are formed after inflammation in the cavity of the chest, or abdomen.

Inflammation of the Testicle.

The substance of the Testicle is frequently inflamed; but this disease is commonly removed by art, and seldom becomes an object of examination after death. It exhibits, however, precisely the same appearances as inflammation of the substance of other parts, and therefore does not require to be particularly described. When the testicle is inflamed, the vas deferens sometimes partakes of the inflammation, its coats becoming considerably thickened, and in some instances the veins of the spermatic cord becoming varicose.* After the inflammation of the testicle has subsided, it is not unusual for a hardness and fulness of the epididymis to remain for a considerable length of time, or even through life. This depends on the matter which had been extravasated during the inflammation, not being afterwards entirely absorbed.

Abscesses of the Testicle.

Abscesses, too, are occasionally formed in the Testicles, from the progress of common inflammation,

* See Mr. Hunter's work on the Venereal Disease, p. 54.

and are attended with the same circumstances as abscesses in other parts.

The Testicle Scrofulous.

The Testicle is sometimes completely changed from its natural structure, and converted into a truly scrofulous mass. On such occasions it is generally enlarged, and when cut into, shows a white, or yellowish-white, curdy substance, which is sometimes more or less mixed with pus.

The Testicle Enlarged and Pulpy.

The Testicle is sometimes much enlarged, and converted into an uniform, pulpy matter, in which its natural structure is entirely lost. This sort of change has been sometimes mistaken for scirrhus, but it is very different from what is called scirrhus in other parts of the body, and what is also found in the testicle itself.*

Scirrhus and Cancer of the Testicle.

The Testicle is also found much enlarged, and changed into a hard mass, which is generally more or less intersected by membranes. In this there is no vestige of the natural structure, but cells are frequently observable in it, containing a sanious fluid, and sometimes there is a mixture of cartilage. This state of the testicle I consider as the true scirrhus, and according to the progress of the disease, the epididymis and the spermatic cord are more or less, or not at all, affected. This disease not unfrequently advances to form a foul deep ulcer with thickened edges, or throws

* The Pulpy Testicle here described, is now considered the same as Fungus Hæmatodes of that organ. (*Ed.*)

out a fungus, and then it is called the true cancer of the testicle.

The Testicle Cartilaginous.

I HAVE seen the Testicle much enlarged, and changed into a mass of Cartilage. There was also, in the case to which I allude, an ulcer near the centre of the cartilage, and in some places an imperfect appearance of cysts or cells. The cartilage did not seem different in any essential property from common cartilage, but was a little softer. This I consider as depending on the same general diseased process with the scirrhus just described, for sometimes both structures are blended together in the same testicle.

The Testicle Bony.

THE Testicle is sometimes converted into Bone. A few instances only of this disease have fallen under my observation, and in them the bony process had not extended over the whole substance of the testicle, but had affected it partially.*

A Cyst adhering to a Testicle, containing a Vena Medinensis.

I HAVE seen a Testicle with a small firm cyst adhering to it, which contained a Worm of that sort called vena medinensis. This is a worm of considerable length, with a smooth surface and an uniform

* It may here be remarked, that the envelope of the Testicle, like other serous membranes, is occasionally ossified. I have seen the ossification both in the tunica vaginalis, and in the albuginea. (*Ed.*)

appearance; at the posterior extremity it terminates in a slender hook-like process, and at the anterior there is a rounded opening or mouth. This testicle had probably belonged to a man who had visited some of those climates in which the vena medinensis is found, and who had brought it over with him to this country.

The Epididymis ending in a Cul-de-sac.

THE Testicles have sometimes this sort of Malformation, that the epididymis does not terminate in a vas deferens, but in a cul-de-sac. In these cases it is evident that the semen cannot be evacuated by the urethra, and that the person must therefore be incapable of procreation. In William Hunter's Museum, a preparation of this sort is preserved; and John Hunter has given a representation of it in his book on the Animal Economy.*

Stricture of the Vas Deferens.

I HAVE also seen a portion of the canal of the Vas Deferens obliterated by Stricture. This had not been an original malformation, but was the effect of a diseased process, similar, probably, to that which produces stricture in the urethra, and must have prevented the semen of one of the testicles from reaching the cavity of the prostate gland.

Testicles very Small, and Wasted.

THE Testicles are sometimes exceedingly small in size. I knew one case, in a person of middle age,

* See p. 47. Plate V.

where neither of them was larger than the extremity of the finger of an adult. This, as appeared from its history, arose from malformation, and was attended with a total want of the natural propensities. It is not uncommon for a testicle to waste either spontaneously, or in consequence of previous inflammation, or compression, so as gradually to disappear entirely.*

Sometimes one testicle, and sometimes both, remain in the cavity of the abdomen through life, so that a person appears to have only one testicle, or to be without them altogether. The testicle or testicles, I believe, are in these cases of a small size; and John Hunter suspected that they are by no means so perfect, as when they descend into the scrotum.†

Diseased Appearances of the Spermatic Cord. Scirrhus of the Spermatic Cord.

The Spermatic Cord is also liable to diseased alterations of structure; one of the most common is that of its becoming scirrhous. This I believe to be very rarely, if ever, an original disease of the cord, but always, or almost always, spreads to it from the testicle. In the early state of a scirrhous testicle, the

* See Hunter on the Venereal Disease, p. 209.

The Testicles sometimes waste away from injuries, or from compression of the Spine at the origin of the Spermatic Nerves. In a man who had received a blow on the lumbar region, the testicle gradually wasted away. In another person, both testes were completely absorbed, nothing being felt in the scrotum but a loose vaginal coat. He soon died of an aneurism of the aorta, formed at the origin of the spermatic arteries, both of which were obliterated. (*Ed.*)

† See John Hunter's Observations on certain Parts of the Animal Economy, p. 18.

spermatic cord is perfectly sound; but when the disease has existed for a considerable time, and does not remain stationary, the cord becomes at length affected. Under such circumstances it is changed into a hard mass, exhibiting the same appearance of structure as the testicle itself. During the last stage, the disease advances to the loins, so as to affect the absorbent glands there.

Varicose Veins of the Spermatic Cord.

A DISEASE of the Spermatic Cord which is not uncommon, is an enlargement of its Veins. The veins of the spermatic cord are numerous, and support a very long column of blood. This last circumstance, added to some impediments which occasionally take place to the return of the blood, renders the veins frequently enlarged. This enlargement varies very much in different cases, arising from the degree and the continuance of the impediment. When the enlargement of the veins is very considerable, they also become varicose, and the spermatic cord is changed into a bulky mass, soft to the feeling, and capable of being readily diminished on pressure. In this state of the spermatic cord, the testicle is sometimes wasted.

Water accumulated in the Cellular Membrane of Spermatic Cord.

WATER has sometimes been known to be accumulated in the cells of the cellular membrane which envelopes the vessels of the Spermatic Cord. The cellular membrane of this part of the body is in considerable quantity, and when water is accumulated in its cells, a large swelling is formed in the situation of

the spermatic cord, which is readily diminished by pressure. When pressure is used, the swelling is diminished, not only by a part of the water being forced into the cells of the cord within the abdominal ring, but also by its being forced into the cellular membrane under the skin of the lower part of the belly. Many pints of water have been known to be accumulated in these cells. It has never occurred to myself to see this disease, and therefore I have had no opportunity of examining the nature of the fluid; but I presume it is of the same kind with that usually found in anasarca.

A Sac containing Water formed in the Spermatic Cord.

A Sac has also been known to be formed in the Spermatic Cord, consisting of a firm white membrane, and containing a fluid, most probably of a serous nature. Both these cases have been particularly described by Mr. Pott, in his treatise on Hydrocele.

SYMPTOMS.

The existence of Hydrocele in the living body may be determined by the shape of the tumor, which is in some degree pyramidal, by the resistance which it gives on pressure, by absence of pain in it, and by the health being not affected by it. Where the tunica vaginalis is thin, and the swelling is placed between the eye and a lighted candle, it will appear transparent. Where the tunica vaginalis, however, is thick, the transparency will be lost, and the tumor to the feeling will be harder, and less compressible. But still it will not have the same degree of hardness or weight as a

scirrhous testicle, and will want some other characteristic marks which belong to that disease.

The formation of Hydatids in the tunica vaginalis testis, is attended with symptoms which correspond very much with those of hydrocele; and this case can only be distinctly known by laying open the sac.

An inflamed Testicle may be distinguished from a scirrhous one in the living body, by a slight attention to the appearances, and to the history of the case. The progress of the disease, in an inflamed testicle, is commonly rapid, and the skin of the scrotum immediately covering it has usually a blush of inflammation; and is occasioned either by an injury, or from sympathetic irritation in the Urethra: but in a scirrhous testicle the progress of the disease is slow, and the skin of the scrotum retains its natural colour, unless it be really affected by the disease. The surface of the tumor in an inflamed testicle is uniform and smooth, but in a scirrhous testicle it is often irregular.

When a Testicle is scrofulous or Pulpy, it may be distinguished from a scirrhous testicle by its greater softness, by the little pain which is felt in it, and by the absence of some symptoms which generally attend scirrhus of this gland, and which are about to be mentioned.*

* The diagnosis between the Pulpy Testicle and Hydrocele is extremely difficult, the one disease having often been mistaken for the other. The want of transparency, and the weight of the pulpy testicle, are the symptoms chiefly to be depended upon. (*Ed.*)

A scirrhous Testicle may be ascertained in the living body by its great hardness, and the pain that is often felt in it, which darts along the spermatic cord to the loins. Its progress is commonly slow, the spermatic cord becomes ultimately diseased, and the general health ultimately much impaired. When it throws out a fungus, or forms an ill-conditioned ulcer, these become additional external marks of the nature of the disease.

The Encysted Tumor of the Spermatic Cord containing water, resembles in some appearances hydrocele. It may, however, be distinguished from it by the testicle being felt separate and entire under the tumor, which in hydrocele is never the case.

CHAP. XIX.

DISEASED APPEARANCES IN THE FEMALE ORGANS OF GENERATION.

Inflammation of the Uterus.

When the Uterus becomes inflamed, it takes place almost always under the same circumstances, viz. very soon after parturition. The Inflammation is sometimes confined to the uterus itself, or its appendages, but the peritonæum in the neighbourhood is most commonly affected, and frequently over its whole extent. The uterus, when inflamed, exhibits the same appearances as inflammation of the substance of other parts, and these are principally observable in its body or fundus. The inflammation is frequently found to creep along the appendages of the uterus, especially the Fallopian tubes and ovaria. It often advances to suppuration, and the pus is generally found in the large veins of the womb. When the peritonæum is also affected by the inflammation, it exhibits the same appearances, formerly described, when treating of the inflammation of this membrane; but the extravasated fluid, and the coagulable lymph, are frequently in a large proportion to the degree of the inflammation.*

* Dr. Clarke, who examined a great many women who died after parturition with inflammation of the peritonæum, has observed this particularly. See Dr. Clarke's Essays, p. 136.

Malignant Ulcer of the Uterus.

It is not unusual for an Ulcer to be formed in the Uterus, of a very malignant nature. This is most apt to happen in women at the middle period of life, or at a more advanced age; but it sometimes happens in women who may still be said to be young. The ulcer generally begins in the cervix uteri, and the uterus is at the same time somewhat harder and larger than in the natural state. It does not, however, grow to any considerable size. The ulcer spreads from the cervix to the fundus uteri, and it is not unusual to see the greater part of the fundus destroyed by it, the rest being changed into a tattered ulcerated mass. The ulceration is not always confined in its boundaries to the uterus, but sometimes spreads into the neighbouring parts, as the vagina, the bladder, and the rectum, making communications between them, and producing dreadful havoc. This disease of the uterus is generally considered as cancer, but it differs in some of its appearances from what is acknowledged to be true cancer in other parts of the body.*

Enlargement and Hardness of the Uterus.

It sometimes happens, although not very often, that the uterus enlarges in size, and becomes much harder than in its natural state. This change corresponds in some respects to that of scirrhus in other

* This diseased change I formerly confounded with the scirrhous enlargement of the uterus, considering them as varieties of the same disease, and, therefore, blended their description together; but in consequence of the accurate observations of Dr. Adams, in his Essay on Morbid Poisons, I have thought it proper to separate them.

parts of the body, and commonly extends over the whole of the uterus. It is difficult to say to what size the uterus may at length arrive, in the progress of this disease, but I have seen it, in one case, as large as the gravid uterus at the sixth month. If a transverse section be made of the uterus in this state, it is found to consist of a hard substance, intersected by thick membranes. Ulceration hardly ever takes place in this condition of the uterus. I recollect one instance, in which there was some appearance of it, but I may have made this remark too hastily, and may have been deceived. Tubercles are occasionally formed in this state of the uterus, being, as it were, imbedded in its substance, and they have a stricture very much resembling that of the uterus itself.

Tubercles of the Uterus.

HARD Tubercles often grow from the Uterus, which are either imbedded in its substance, or arise from its outer surface. They vary a good deal in their size, viz. from that of a hazel nut, to more than the size of the fist. They are irregular in their shape, but are commonly rounded, and are often in some degree knotted. These, when cut into, exhibit a hard whitish substance, intersected by membranous septa, which are commonly very thick and strong. They have little or no disposition to ulcerate. The uterus, in this state of disease, is generally of the natural size, and possesses the healthy structure, but occasionally it is much enlarged.

A mass of the same kind is sometimes found in the cavity of the uterus, and often grows to a very large size. I have seen it a good deal larger than a child's

head at birth. This mass, when cut into, exhibits precisely the same appearances as those which we have so lately described. It is remarkable, that such masses within the cavity of the uterus commonly do not adhere in any part closely to it, but are connected with it loosely, by the intervention of cellular membrane and small blood vessels, so that they can be very easily peeled off, without injuring the structure of the uterus. The uterus itself is more or less enlarged according to the bulk of the mass it contains, but it appears to be perfectly healthy in its structure.

Polypus of the Uterus.

Polypus forms a very common disease of the Uterus, and may take place almost at any period of life; it is more frequent, however, at middle or advanced age, and rarely happens in persons who are young. By a polypus is meant a diseased mass, which adheres to some part of the cavity of the uterus, by a sort of neck or narrower portion. Polypus is of different kinds; the most common kind is hard, and consists of a substance divided by thick membranous septa. When cut into, it shows precisely the same structure as the tubercle of the uterus just described; so that a person looking on a section of the one and the other, out of the body, could not distinguish between them. This sort of polypus varies very much in its size, some not being larger than a walnut, and others being larger than a child's head. It adheres by a narrower portion or neck, which varies a great deal in its size, and in its proportion to the body of the polypus. The largest polypus I ever saw was suspended by a neck hardly thicker

than the thumb; and I have seen a polypus, less than the fist, adhering by a neck fully as thick as the wrist.

The place of adhesion also differs considerably. It is most commonly at the fundus uteri, but it may take place in any other part; and I have seen a small polypus adhering just on the inner part of the lip of the os uteri. When a polypus is of any considerable size, there is generally one only; but I have occasionally seen on the inside of the uterus, two or three small polypi; and in some instances, several polypi have been known to grow from the uterus in succession.

Another sort of polypus forms in the uterus, which consists of an irregular, bloody substance, with a number of tattered processes hanging from it. This, when cut into, exhibits two different appearances of structure; the one appearance is that of a spongy mass, consisting of laminæ, with small interstitial cavities between them; the other is that of a very loose texture, consisting of large irregular cavities. It is very obvious, that in proportion as a polypus grows, the cavity of the uterus must be enlarged; and the same change must take place in the vagina, when a polypus protrudes from the uterus into this canal.

Inversion of the Uterus.

The Inversion of the Uterus occasionally takes place, and principally from two causes, viz. from the weight of a polypus, or from violent pulling, in attempts to remove the placenta. When the inversion is incomplete, the fundus uteri forms a tumor within its cavity; there is at the same time an appearance of fissure on the outside of the uterus, where the fundus usually is; and the Fallopian tubes, the round ligaments,

and the ligaments of the ovaria, are drawn inwards at both edges of the fissure. The uterus, particularly after labour, is sometimes inverted entirely, the inner surface being exposed, and the fundus uteri forming a large tumor within the vagina, and in some cases even on the outside of the labia.

Prolapsus of the Uterus.

The Uterus sometimes leaves its natural situation and falls downwards, so as either to approach the external parts, or to pass out of the body entirely. This is most apt to happen when women have a large pelvis, and where the soft parts have been very much relaxed by repeated and severe labours. This disease is called prolapsus uteri, and will be explained more particularly when I come to treat of the diseases of the vagina. It is much more frequent than the other disease called the inversio uteri.

Stricture in the Cavity of the Uterus.

A Stricture is sometimes formed within the cavity of the Uterus, so that its cavity at one part is entirely obliterated. This I believe almost always to take place at that part, where the cavity of the fundus uteri terminates and the cervix begins, for in this place the cavity of the uterus is narrowest. As the sides of the cavity round this place lie very near each other, and form naturally a small aperture, it is probable that some slight inflammation may unite the parts, and shut up the aperture; or the parts may gradually approach each other without this cause, as in strictures of the urethra.

The Os Uteri Contracted, or Closed up.

THE os uteri has been found to be so contracted, as to have its passage in a great measure obliterated*; and it has even been known to be closed up, by the growth of an adventitious membrane.†

Uterus Bony.

THE substance of the Uterus is sometimes more or less converted into Bone. This arises from a particular morbid action of its blood-vessels, by which they secrete from the blood bony matter, and it is a very rare disease.

The Uterus Changed into an Earthy Substance.

THE uterus has also been known to be converted into an earthy substance.‡ It is probably of the same kind with the earth of bones; and this disease perhaps differs only from the former, in there being a less proportion of animal gluten, to combine the earthy particles together.

A Bony Mass in the Cavity of the Uterus.

IN the cavity of the Uterus a bony mass is sometimes found. When this is the case, I suspect that the hard fleshy tubercle within the cavity of the uterus, such as I have already described, has been converted into Bone. This at least had taken place in the only instance which I have known of this disease, for a great part of the tubercle still remained unchanged; and I think it very probable, that such a

* Vid. Morgagni, epist. lxvii. art. 11.

† Ibid. epist. xlvi. art. 17.

‡ Vid. Lieutaud, tom. i. p. 323.

change most frequently happens, where these bony tumors are found.

Stones in the Cavity of the Uterus.

Stones * have sometimes been found in the cavity of the Uterus. These are described by authors as varying in their appearance, some being of a dark, and others of a light colour. They are silent about their nature, and I can say nothing of it from my own knowledge, as it has never occurred to me to see an instance of this disease. Such concretions are probably formed from matter thrown out by the small arteries which open on the internal surface of the uterus, and are in some degree analogous to the concretions which are formed in some glands of the body.

Dead Fœtus in the Uterus Converted into an Earthy Mass.

It has also been known to happen, that a Dead Fœtus has remained for a long time in the cavity of the Uterus, and has there been gradually changed into an earthy mass preserving the shape of the child.†

Water in the Cavity of the Uterus.

Water has sometimes been known to be accumulated in the cavity of the Uterus in very large quantity.‡ In some cases fifty, sixty, or even a hundred pints, have been said to be accumulated. This water is sometimes bloody in appearance, and some-

* Vid. Lieutaud, tom. i. p. 339.

† See Cheselden's Anatomy of the Bones, plate lvi.

‡ Vid. Lieutaud, tom. i. pp. 319. 333.

times of a yellowish colour. Of its nature I cannot speak particularly, as I have never seen an instance of this disease. I think it probable, however, that the water accumulated in the cavity of the uterus resembles in its properties the serum; and that it is poured out by the small curling arteries of the uterus. In cases where water is really accumulated in the cavity of the uterus, one must suppose a stricture of the cervix, otherwise the water would escape into the vagina, as it is formed. I am disposed to believe, however, that where water has been said to be accumulated in the cavity of the uterus, it has frequently been really in one or more large hydatids formed in that cavity.*

Hydatids in the Uterus.

LARGE masses of Hydatids † have also been found in the cavity of the Uterus. Whether these be commonly of the same kind with what occasionally grow in the placenta, or like those in other parts of the body, I cannot determine, as it has not occurred to me to see an example of this disease. The hydatids of the placenta differ a good deal from those of the liver, kidneys, and some other parts of the body. They consist of vesicles of a round or oval shape, with a narrow stalk to each, by which they adhere on the outside of one another. Some of these hydatids are as large as a walnut, and others as small as a pin's head. A large hydatid has generally a number of small hydatids adhering to it by narrow processes. Of their real

* Dr. Denman observed a case, where water was accumulated in one large hydatid of the uterus.

† Vid. Lieutaud, tom. i. p. 335.

nature nothing is known, but they are probably animals of a very simple structure. In the same quadruped different species of hydatids will sometimes occur, and therefore the same thing may take place in the human subject. I believe that the hydatids said to be found in the uterus have not uncommonly been only hydatids of the placenta, which had been retained there.

Air in the Uterus.

Air has sometimes been known to be accumulated in the cavity of the Uterus, but this occurs very rarely, and has not, except in one instance, fallen under my own observation. The air when so accumulated sometimes escapes through the os uteri, with a noise somewhat similar to that which is occasioned by the escape of air from the rectum. This air is probably formed by the small blood-vessels of the uterus in a manner analogous to secretion, and its properties are at present unknown.*

Rupture of the Uterus.

These are the various diseased appearances which are well ascertained to take place in the uterus. I have to add, that the womb is not unfrequently ruptured, which is rather to be considered as an accident than a disease. This, perhaps, never takes place but in the pregnant uterus, and at the time of labour; and it chiefly arises from the too violent action of the muscular fibres of the uterus upon the child, when there is more than the ordinary resistance to its expulsion. The ruptures which I have seen have been commonly in the side of the womb, and of considerable extent. The

* Vide Portal's Anatomie Médicale, tom. v. p. 525.

peritonæum covering the womb sometimes remains whole, and there is a large mass of black coagulated blood lying between it and the uterus, where the rupture has taken place. This black appearance is occasionally mistaken for mortification.

Two Uteri.

It has sometimes happened, although very rarely, that two uteri have been formed in the same person. In this case there is but one ovarium and one Fallopian tube to each. The vagina is at the same time divided by a septum into two canals, each of which conducts to its proper uterus. In the case which is described in the Philosophical Transactions*, a communication was formed at one part through the septum; but how far this generally takes place in such a monstrosity, I cannot determine.

Natural Varieties in the Uterus.

The Uterus varies a good deal in its size in different persons, in some being fully twice as large as it is in others. It differs also somewhat in the thickness of its substance. There is some difference, too, in its situation, being often placed nearer one side of the pelvis than the other. All these are to be considered as varieties in the natural formation, and not as disease.†

* See Philosoph. Transact. vol. lxiv. p. 474.

† A very excellent account of these diseases of the uterus has lately been published by Mr. Clarke, which may be consulted with great advantage.

SYMPTOMS.

In Inflammation of the Uterus, there is a sense of pain and tension in the hypogastric region, and the pain is increased on pressure there, or on touching the os uteri. There is vomiting, and the bowels are sometimes costive, and sometimes disposed to looseness. The whole constitution is roused into action, exhibiting those symptoms which have been called fever, and the pulse has commonly a great degree of frequency. When the peritonæum is inflamed throughout the whole surface of the abdomen, or to a considerable extent, there is a general swelling of that cavity, with pain and extreme tenderness on pressure, and the feverish symptoms are increased.

In the Malignant Ulcer of the Uterus there is a sense of pain in the hypogastric region, which is often very violent. At the same time there is commonly felt a dull pain round the hips and down the thighs. Mucus, pus, and blood, are frequently discharged by the vagina, and the quantity of blood is sometimes very large. The pulse at the beginning of this dreadful disease is natural, and the general health is but little impaired; but when it is far advanced, the pulse becomes quick, the countenance sallow, and the body emaciated.

If in the progress of the disease a communication should be formed between the vagina and the urinary bladder, the urine will then pass off by the vagina. Some of the glands of the groin, in advanced stages of the disease, often become hard and enlarged.

In the Scirrhus of the uterus there are few Symptoms to characterise it, till the disease has made considerable progress. There is pain in the hypogastric region and round the hips, which is more or less acute in different cases; but this is common to it with several other diseases. When the disease, however, is a good deal advanced, it may be ascertained on examination by the vagina. The os tincæ will then feel enlarged and hard, and there will be an unusual sense of weight against the finger, from the increased size of the uterus. A tumor may at the same time be distinctly felt above the pubes. This disease is commonly attended with mucous discharges from the vagina, and profuse discharges of blood at the monthly periods. The pulse is generally natural, and the health not much impaired.

When the Tubercles formed on the outer surface of the Uterus, or imbedded in its substance, are small, and the uterus is nearly of its natural size, little inconvenience is probably produced by them. When the tubercles, however, are large, they will, according to their size and situation, produce more or less difficulty in passing the urine, or in passing the fæces. When a tubercle grows from the anterior surface of the fundus uteri, and is large, and the patient rather of a spare habit, its existence and nature may be satisfactorily ascertained by an examination in the living body.

The Symptoms which attend a Polypus of the Uterus are mucous and occasional bloody discharges by the vagina, with frequent pains round the hips. When it has made considerable progress in its growth, it may be ascertained by an examination by the vagina.

Even without this examination, it may be distinguished from an ulcer of the uterus, by attention to the history of its progress, and by the general health being much less affected in this case than when an ulcer has been formed. The glands of the groin are, I believe, never affected from a polypus, but are often tainted by absorption in advanced stages of the ulcerated uterus.

When there is a part of the fundus uteri inverted, forming a tumor in the cavity of the uterus, there are no symptoms by which it can be sufficiently distinguished in the living body. It is attended with a profuse hæmorrhage ; and if the patient should survive, the menstrual flux is in very large quantity, together with very copious mucous discharges during the intermediate times. When the inversion is complete, it can be ascertained by an examination of the tumor, but is not distinguished by any peculiar symptoms. The attempts which have been made to return the uterus to its natural situation have almost always been unsuccessful.

Prolapsus Uteris is attended with more or less of the pain in the loins, and also with a pain in the groins, which shoots down to the labia. There is more or less of a mucous discharge from the vagina, and sometimes there is strangury. There is also a sensation of bearing down, and of weight in the region of the parts affected. These symptoms disappear, or are very much lessened, when the patient has been for a short time in a horizontal posture. The exact circumstances belonging to this complaint cannot, however, be fully ascertained, without an examination.

There are no Symptoms by which Dropsy of the Uterus can be distinguished from some other diseases of this organ, and therefore it is only known in consequence of the evacuation of water by the vagina. There will of course be more or less enlargement of the uterus, and fulness of the hypogastric region, in proportion to the accumulation of the water, and this will subside when the water is evacuated.

Hydatids in the uterus are not distinguished by any characteristic symptoms, and are only known to exist in consequence of their expulsion, by the contractile power of this viscus. This generally takes place, and is attended with pains resembling very much the pains of labour.

A Rupture of the Uterus can only be fully ascertained by examination. It is attended with pain, with a sense of something having given way in the abdomen, and with almost an immediate vomiting of a chocolate-coloured matter. The uterus gives up its natural efforts for the expulsion of the child, so that the labour pains cease; the child is retracted, and generally escapes, either wholly or in part, into the cavity of the abdomen.

CHAP. XX.

DISEASED APPEARANCES OF THE OVARIA.

Inflammation of the Peritonæal Covering of the Ovaria.

The portion of the Peritonæum which covers the Ovaria, I believe, is seldom inflamed, unless where the inflammation has spread to it from the uterus, or where it has attacked this membrane generally. It is not unusual, however, for it to be inflamed under both of these circumstances; and it shows the same appearances as the inflammation of the peritonæum covering any other part. Adhesions, too, are frequently found, joining the ovaria to the neighbouring parts, which had been the consequence of such an inflammation.

Inflammation of the Substance of the Ovaria.

Where the uterus has been inflamed to a considerable degree, as after parturition, the substance of the Ovaria has also been occasionally attacked by the Inflammation spreading to it. The ovaria are then enlarged, are harder than in a natural state, and are highly vascular; very commonly pus is found to have been formed.

Enlargement and Hardness of the Ovaria.

The Ovaria sometimes become considerably enlarged, and are converted into a whitish hard mass,

which is more or less intersected with membranous septa. This change of structure is similar to what takes place in the fleshy tubercle of the uterus already described, and I believe has no tendency to ulcerate; but it occurs much more rarely than the fleshy tubercle of the uterus. These hard masses have sometimes a disposition to be converted into bone; and in this way most frequently, I believe, the ovaria become bony. The bony substance into which they are converted has sometimes a greater admixture of earth than the natural bones of the body.

Ovaria Enlarged and Changed into a Pulpy Substance.

THE Ovaria are sometimes very much enlarged, and converted into a pulpy matter of a smooth uniform texture. Cells are often formed in a part of this substance, which contain a fluid.

Ovaria Scrofulous.

THE Ovaria are sometimes changed into a true scrofulous matter, intermixed with cells.

Dropsy of the Ovaria.

THE most common disease of the Ovaria is Dropsy. The whole substance of an ovarium is sometimes converted into a capsule containing a fluid. The capsule is frequently of a large size: it consists of a white firm membrane, and contains an aqueous fluid, capable of being partly coagulated.

When the ovaria have become dropsical, and their natural structure has entirely disappeared, it is very common for them to be converted into a number of cells communicating with each other by considerable

openings, and to be prodigiously enlarged. An ovarium in this case may be so increased in size, as to occupy almost the whole cavity of the abdomen. The ovaria are also sometimes converted into a congeries of cysts, which have no communication with each other. These vary a good deal in their size, some being not larger than a hazel nut, and others as large as an orange. Their coats are sometimes thin, sometimes of considerable thickness, and consist of a compact, white, laminated membrane. They contain either a serous fluid, with which I have seen some slimy matter mixed, or a thick ropy fluid, or a kind of jelly. This jelly is sometimes so tough, that it can be drawn out to a considerable length, and when broken, it passes back with a great deal of elastic force. Different cysts in the same ovarium will sometimes contain different sorts of fluid.

It also happens, sometimes, although rarely, that pus is found in one or more cysts of a dropsical ovarium, mixed with the serum or the jelly which is there accumulated. This has been produced by inflammation in some part of the inner surface of the ovarium, occasioned probably by the great distention of that part in consequence of the accumulation of fluid there. A great quantity of pus has sometimes been found, where inflammation has been extended over a large portion of the inner surface of the ovarium, and this has most frequently taken place where inflammation has been produced in consequence of the operation of tapping the ovarium.

These cysts in the ovarium have, I believe, been occasionally confounded with hydatids, to which they bear some resemblance. They are, however, very dif-

ferent. They have much firmer and less pulpy coats than hydatids: they contain a different kind of fluid, and they are differently connected among themselves. Hydatids either lie unconnected with each other, or a large hydatid encloses a number of smaller ones; or smaller hydatids adhere to the coats of those which are larger. Cysts of the ovarium adhere to each other laterally by pretty broad surfaces; do not enclose each other; and appear to have no power analogous to generation, as hydatids have, by which smaller cysts are formed, that are attached to those of a larger size. It appears not improbable, that these cysts are formed by a gradual enlargement of the small vesicles, which make a part of the natural structure of the ovaria.

The Ovaria Changed into a Fatty Substance, with Hair and Teeth.

The Ovaria are sometimes converted into a fatty substance, intermixed with long Hair and Teeth, which is surrounded by a capsule consisting of a white strong membrane. The hairs are most of them loose in the fatty substance, but many of them also adhere on the inside of the capsule. Teeth, too, are formed, but are generally incomplete, the fangs being wanting. These sometimes arise immediately from the inner membrane of the capsule, and are sometimes connected with an irregular mass of bone. Such productions have been commonly considered as very imperfect ova, in consequence of impregnation; but there is good reason to believe, that they can take place without any intercourse between the sexes. I have described a case, which has been published in the Philo-

sophical Transactions, where it was hardly possible that impregnation could have happened. The girl in whom this change of the ovarium was found, could not, from all appearances, have been more than twelve or thirteen years old; the hymen was perfect; and the uterus had not received that increase of bulk which is usual at puberty. The other marks of puberty were also wanting. From these circumstances, I should judge the womb to have been incapable of the stimulus of impregnation. A tumor, consisting of teeth and hair, was preserved by the celebrated Ruysch * in his collection, which, he says, was found in a man's stomach. If this be true, and there seems to be no reason to doubt it, my conjecture is put beyond dispute. This production could not possibly, under such circumstances, have any connection with impregnation; and if it occurs without it in one part of the body, there can be no good reason why it may not also take place without impregnation in another part. These productions are much more frequent in the ovaria than any where else, probably because the process which forms them bears some analogy to generation, in which the ovaria are materially concerned. I must still, therefore, whatever objections have been made to it, retain my former opinion. These masses in the ovaria are commonly about the size of a large orange.

I have met with the same kind of fatty substance intermixed with hair, and the body of one tooth covered with enamel, in the ovarium of a woman about eighteen years of age. In this case, the uterus was rather less than its usual size in the adult when unim-

* Vid. Ruysch, tom. ii. Adversar. Anatomicor. decad. tert.

pregnated, and there was no membrana decidua formed in its cavity. It appeared, therefore, to be undergoing no change similar to what happens when there is an ovum growing in the ovarium or the Fallopian tube. The hymen, too, was perfect, the edge of the membrane being quite sound and natural, and the aperture in it being remarkably small. These circumstances do not amount to demonstrative evidence, but still must be considered as a very strong confirmation of the truth of the opinion above stated.*

* I have been informed by Mr. Colman, that a dead gelding was some time ago examined, in which a cyst was found a little under the right kidney, containing a fatty matter, hair, and some teeth. This fully establishes the truth of the opinion above stated.

The particulars discovered by dissection are very curious, and are so clearly stated by Mr. Colman, that I shall subjoin his account of them.

"A bay gelding, seven years old, was attacked with glanders, in consequence of which he was destroyed. After the morbid parts concerned in this disease had been examined, Mr. Percivall, Veterinary Surgeon, accidentally opened the cavity of the abdomen, and discovered a tumor, about the size of a horse's testicle, of an oblong form, a little below the right kidney, and loosely attached by a long slender neck to the peritonæum. Mr. Percivall removed this tumor; and as the inner parts felt as if they were of a bony nature, a longitudinal section of it was made with a saw. It now appeared that the outer cyst of the tumor contained two small molar horse-teeth, and one incisor tooth, with a portion of bone attached to this tooth resembling the jaw. The remainder of the tumor was composed of about two thirds of fat, and one third of hair of a black colour, contained in a separate cyst. The molar teeth, which were divided by the saw longitudinally, had the natural arrangement of enamel and bony matter. Two very small blood-vessels were observed going from the neck of the tumor into its substance, but they were not attended to till

A Fœtus in the Ovarium.

A FŒTUS is sometimes found in the Ovarium. This seldom arrives at the full size, but its formation as far as it goes is commonly perfect. When this happens, all vestige of the ovarium is lost, and instead of it there is a bag of some firmness containing the fœtus: on the inside of this bag is attached a placenta, and a part of the chorion. The bag can be ascertained to be the ovarium, by tracing upon it the Fallopian tube and the spermatic vessels from their origin to their termination. The uterus in such cases is considerably larger than when unimpregnated, and in its cavity there is formed the membrana decidua. This shows that the uterus takes on the same changes, although imperfectly, which it does in the ordinary circumstances of pregnancy. The spermatic vessels are also enlarged, in order to supply a sufficient quantity of blood to the ovum which is growing in the ovarium.

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the section had been made. As the history of this horse could not be procured, it cannot be ascertained whether both testicles had previously been removed. It is possible that one testicle might have remained in the abdomen; and the form, situation, and size of the tumor rather favour this supposition. But whether blood-vessels were formed from the neighbouring parts to produce this peculiar organisation, or whether the teeth and hair were produced by the spermatic vessels, the process is equally curious and inexplicable. This phenomenon, however, fully establishes the opinion of Dr. Baillie, that when teeth, and hair, and fat, are found in the ovaria, impregnation is not necessary to their formation; and, therefore, it is highly probable, that in no instance has it been the cause of these extraordinary productions in the ovaria."

Shrinking of the Ovaria.

The Ovaria commonly shrink towards old age, and are changed in their structure. They are diminished to half their natural size, are somewhat tuberculated on their surface, and are hard. When cut into, the vesicles, which make a part of their natural structure, are filled with a white solid matter.

One Ovarium or both Wanting.

An Ovarium on one side has been known to be wanting; but this is extremely rare. An example of this kind is preserved in William Hunter's Museum. Some instances have been recorded, in which no vestige of an ovarium could be observed on either side.

SYMPTOMS.

As the Ovaria are very seldom inflamed, unless when Inflammation has at the same time attacked the uterus, it is not known whether there be any particular symptoms which characterise inflammation of the ovaria. Inflammation of the ovaria cannot at present be distinguished, by its symptoms, from inflammation of the uterus.

A hard state of the Ovaria is with difficulty determined in the living body. When an ovarium of this kind has increased to a large size, and lies upon the side of the pelvis, and the person is at the same time of a spare habit, it may in some measure be ascertained by an accurate examination of the tumor through the parietes of the abdomen. The tumor will feel much harder than where an ovarium is enlarged by dropsy,

or filled with cysts. When the ovarium is not capable of being accurately examined, the opinion about the existence of this disease must rest much more on probable evidence, than on any clear proof.

Dropsy of the Ovarium cannot be ascertained in a very early stage of the disease. But when it has made considerable progress, so as to have formed a swelling at the lower part of the belly, it may commonly be ascertained by an accurate examination, and attention to the history of its growth. The tumor is, generally, more on one side of the abdomen than on the other, according as the right or left ovarium is affected. There is often an inequality in the surface of the swelling, and an obscure kind of fluctuation is felt on striking with the hand the parietes of the abdomen, which cover the swelling. The health is commonly very little affected by this disease, and it is slow in its progress, so that life will often be continued with tolerable comfort for many years. The quantity of the urine is sometimes little diminished, and the absorbents of the ovarium are hardly capable of being excited to a vigorous action by medicine. There have been few instances, therefore, of a dropsy of the ovarium being cured.

CHAP. XXI.

DISEASED APPEARANCES OF THE FALLOPIAN TUBES.

Inflammation of the Fallopian Tubes.

When the uterus is inflamed to a considerable degree, the inflammation often spreads along the Fallopian Tubes: they become, in this case, highly vascular, and when cut open, sometimes contain blood in their cavities. The inflammation may even advance to suppuration, when their cavities become filled with pus.

Adhesions.

When the peritonæum generally, or some part of it in the neighbourhood of the Fallopian tubes, is inflamed, the external covering of these tubes, which is a continuation of the peritonæum, also partakes of the inflammation. This, when it subsides, generally terminates in adhesions of the Fallopian tubes to the contiguous parts. It is not unusual to find the fimbriated extremity of the Fallopian tubes adhering to the ovaria; or when the previous inflammation has been considerable, to find the fimbriated appearance entirely lost, and the body of the Fallopian tube apparently terminating on the surface of the ovarium. Under such circumstances there is no aperture towards this end of the Fallopian tubes, and it has lost its power of conveying the ovum from the ovarium to the uterus.

The very small aperture by which the Fallopian tube communicates with the cavity of the uterus is sometimes obliterated, but not so often as the aperture of that extremity next to the ovarium.

Dropsy of the Fallopian Tubes.

When the Fallopian Tube has its apertures closed at both extremities, it is sometimes dilated into a considerable tortuous cavity. This when laid open appears occasionally subdivided by small partial septa, and contains an aqueous fluid, which is capable of being partly coagulated. This fluid is undoubtedly supplied by the secretion of the small arteries belonging to the inner membrane of the Fallopian tube, which is naturally very vascular. It may be called Dropsy of the Fallopian Tube. The quantity of fluid which is generally accumulated in this state of the Fallopian tube is small, but sometimes, although very rarely, it has been known to amount to many pints.*

The Fallopian Tubes Terminating in a Cul-de-sac.

I have seen the Fallopian Tubes without an aperture or fimbriated extremity, from a defect in the original formation, and terminating in a cul-de-sac. Under such circumstances they were, of course, incapable of performing their office subservient to generation.

An Ovum in the Fallopian Tube.

The Fallopian Tube is sometimes dilated into a bag containing an Ovum. This arises from the ovum being stopped in its progress from the ovarium to the uterus.

* Vid. Portal's Anatomie Médicale, tom. v. p. 543.

When it is so stopped, it does not die, but is gradually evolved, as if it had been lodged in the cavity of the uterus. This, among many others, is a proof that the uterus is not the only organ which is fitted to evolve an ovum, but that other parts of the body can perform this office. While the ovum is enlarging, the Fallopian tube is more and more dilated, forming a thin bag round the ovum. The blood-vessels passing to the ovarium and the Fallopian tube where the ovum is contained are gradually enlarged in proportion to the increase of the ovum, in order to supply it with a sufficient quantity of blood. While this process is going on in the Fallopian tube, the uterus increases in bulk so as to be fully twice its natural size, and it becomes more vascular. The cavity of its fundus is also lined with a membrana decidua, and the cervix uteri is plugged up with jelly. The uterus therefore undergoes a variety of changes, exactly similar to those which take place in natural pregnancy. The ovum sometimes makes considerable progress in the Fallopian tube, and has been known to advance even to the full period of gestation; but more commonly it dies at an early period. In the course of the evolution of the ovum, the Fallopian tube has been known to rupture, and the person to die from internal hæmorrhage. A very accurate account of such a case has been published by Dr. Clarke, in the Medical and Chirurgical Transactions.*

Hard Tumor Growing from a Fallopian Tube.

I HAVE seen a hard round tumor growing from the outer surface of one of the Fallopian tubes. This,

* See p. 261. vol. ii.

when cut into, exhibited precisely the same appearance of structure as the tubercle which grows from the surface of the uterus; consisting of a hard white substance, intersected by strong membranous septa. This, however, I believe to be a very rare appearance of disease.

Diseased Appearances of the Round Ligaments.

The Round Ligaments partake of the inflammation of the uterus, when it is considerable and has spread to its appendages. They are also, doubtless, subject to other diseases, but these are very rare, and have not fallen under my own observation, nor do I know of their having been particularly taken notice of by authors.

SYMPTOMS.

The Symptoms which attend the different morbid changes of the Fallopian Tubes are not known; and they must, from the circumstances belonging to them, be very difficult to ascertain.

CHAP. XXII.

DISEASED APPEARANCES OF THE VAGINA.

Inflammation of the Vagina.

THE internal surface of the Vagina, near the outward opening, is frequently inflamed, especially from the application of the venereal poison; but this hardly ever becomes the subject of examination after death.

Adhesion of the Sides of the Vagina.

A VERY violent inflammation has sometimes been known to take place in the vagina, which has terminated in the mutual adhesion of the sides of that cavity. This adhesion is sometimes extended over a great part of the cavity, but is often more limited, producing a stricture in some one part.

Ulcers of the Vagina.

ULCERATIONS are not unusual in the Vagina. They sometimes appear like pieces of the internal surface removed as it were by a knife, and sometimes there is a foul ragged ulcer. When this last is the case in any considerable degree, the ulcer has not commonly originated in the vagina, but has spread to it from the womb. When the ulcer spreads very much, communications are often formed with the neighbouring parts, and render existence most miserable. Thus,

communications are sometimes formed between the vagina and the rectum, or between the vagina and the bladder.

Hard Tumors in the Vagina.

HARD Tumors occasionally grow in the Vagina, although, I believe, rarely when the uterus is not affected. When cut into, they exhibit a structure very similar to that of the tubercle of the uterus, which has already been described.

Inversion of the Vagina.

ONE of the most common diseases of the Vagina is its Inversion, or prolapsus: this is more apt to happen where the natural formation of the pelvis is large, where the external opening at the vulva is wide, and where the parts are generally relaxed. The prolapsus is more or less in different cases; in some the uterus does not pass out at the external parts, and in others the inversion of the vagina is complete, at the extremity of which is situated the os uteri. The protrusion has then different shapes: it sometimes forms a large rounded mass, and sometimes it is narrower and more elongated, extending, perhaps, five inches from the surface of the body. When this has been the case, it has been sometimes mistaken for that species of monstrous formation called hermaphrodite. I may here take an opportunity of mentioning, that although in some of the common quadrupeds a real hermaphrodite structure has occasionally been found, yet it has hardly ever occurred in the human subject.* When

* Although the examples of what have been called Hermaphrodites in the human species have, when strictly examined,

the vagina has been long subject to inversion, its inner surface becomes in many parts drier and harder than natural; it is likewise apt to be occasionally inflamed from external irritation, which not uncommonly advances to ulceration.

In inversion of the vagina and prolapsus of the uterus, if the cavity of the pelvis be examined, the fundus only of the uterus can be seen with its appendages very imperfectly, or the whole of the uterus is hid entirely:

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been hitherto found to belong either to the male or to the female sex, yet Dr. Storer of Nottingham has given me an account of a person so strongly marked as a hermaphrodite, that no doubt can, I think, be reasonably entertained of this being the case. The subject of this singular monstrosity is still alive, and has been carefully examined by Dr. Storer and others: I shall insert here Dr. Storer's account of the case.

The person bears a woman's name, and wears the apparel of a woman. She has a remarkably masculine look, with plain features, but no beard. At this time she is twenty-four years of age, has never menstruated, and had not been sensible of having had any bad health, but only came to the hospital in order to comply with the wishes of her mistress. Various medicines were given without producing menstruation, which led to the suspicion of the hymen being imperforated, and the menstrual blood being accumulated behind it. She was, therefore, examined by Mr. Wright, one of the surgeons to the hospital, and by Dr. Storer.

The vagina was found to terminate in a cul-de-sac, two inches from the external surface of the labia. The head of the clitoris, and the external orifice of the meatus urinæ, appeared as in the natural structure of a female, but there were no nymphæ. The labia were more pendulous than usual, and each contained a body resembling a testicle of moderate size, with a spermatic cord. The mammæ resembled those of a woman. The person had no sexual desire, or partiality for either sex.

the bladder then appears to be in contact with the rectum. In this state of the uterus and its appendages, I have known adhesions formed between them and the neighbouring parts. These must have rendered the reduction of the uterus and the vagina to their natural situation very difficult, and, perhaps, till the adhesions were a good deal elongated, impossible.

The Vagina very Short.

THE Vagina is sometimes very short. I have seen it not more than half its natural length. This is an original defect in the formation of the part, and can only be ascertained by an examination.

The Vagina Widened.

THE Vagina is sometimes very much stretched or widened by large tumors which are lodged in it: these are chiefly polypi; and when they have been removed by art, the vagina, if it has not been for a long time stretched, recovers nearly its natural size.

The Vagina very Narrow.

THE Vagina has occasionally been found to be very much contracted in its transverse diameter, from a defect in the original formation. This, however, occurs very rarely, and may, in some degree, be remedied by art.

SYMPTOMS.

THE Symptoms which attend Inflammation of the Mucous Membrane of the Vagina and the labia are too well known to require any description here.

An Adhesion of the sides of the Vagina can only be distinctly known by an examination. It may, however, be strongly suspected where there has been a previous violent inflammation of the vagina, and since that period there has been no menstrual discharge, together with an unfitness for the sexual intercourse. When the adhesion has extended over a considerable part of the vagina, it is hardly possible by an operation to separate the adhering surfaces, and to restore the original canal. I have known attempts of this kind to fail in the most skilful hands; and they require much nicety of management to avoid making an opening into the bladder or into the rectum. Where the extent of the adhesion is small, it is very capable of being remedied by an operation, except, perhaps, very near the internal extremity of the vagina. As it is impossible, when the adhesion is complete, to know, *à priori*, whether it be of large or of small extent, it is almost always proper to attempt an operation; but this should only be done with extreme caution, and by a surgeon who is dexterous in the management of the knife. Where there is merely a narrow line of adhesion, this may probably be discovered by the accumulation of the menstrual blood behind it; and it is possible that this accumulation may at length break through the adhesion, and render an operation unnecessary. It would be absurd, however, to delay an operation which, under such circumstances, must be very slight, for the very uncertain chance of this effect taking place.

Ulcers in the Vagina can only be determined with accuracy in the living body by an examination. They are attended with more or less pain, and with a dis-

charge of pus ; but both of these symptoms belong also to inflammation of the vagina, without any ulceration whatever.

The Symptoms attending an Inversion of the Vagina, and a prolapsus uteri, have been already explained in the chapter on diseases of the uterus. As the exact circumstances of the disease can never be known, except by examination, such an examination should always be strongly recommended.

The existence of Tumors growing in the Vagina can only be accurately ascertained by an attentive examination.

CHAP. XXIII.

DISEASED AND PRETERNATURAL APPEARANCES OF THE EXTERNAL PARTS.

The Hymen Imperforated.

The Hymen is sometimes found without a perforation, so that the vagina is completely shut up at its external extremity. This is an original malformation, which is frequently not discovered till the age of puberty, when the menstrual blood is accumulated behind it. It is of little consequence, as it can be easily remedied by a simple operation.

The Clitoris Enlarged.

An enlarged Clitoris is also a natural deformity, less common than the other, but a more unfortunate one. At birth, the clitoris, in such a case, is often larger than the penis of a male child of the same age. It has a well formed prepuce and glans, together with a fissure at its extremity, so as to resemble almost exactly the external appearance of the male organs. These cases have given rise to a mistake, with regard to the sex, and females have often been baptized for males. On most occasions, however, where there is an enlarged clitoris, the sex may be determined by the following circumstances: — The labia are well formed, and no round bodies are to be felt in them like the testicles. The fissure at the extremity of the glans

does not lead to any canal like a urethra; but under the glans, and at the posterior extremity of the fissure, there is an opening which leads immediately to the bladder. I should believe, that by putting a small straight probe into this orifice, and passing it into the bladder, it could be at once determined, on most occasions, whether the child was male or female.* If the child should live to grow up, the clitoris enlarges, but not in the same proportion as the penis would do. Such cases have been often mistaken for hermaphrodites.

The Nymphæ Enlarged.

The Nymphæ are not unfrequently enlarged beyond their natural size. This sometimes happens to one only, and sometimes to both. When the Nymphæ are very much enlarged, they pass considerably beyond the surface of the body, and have the same sort of covering with the labia, losing by their exposure the fine, vascular, sensible covering of the natural nymphæ. This is a malformation of no great consequence, unless the enlargement be excessive, and even then the nymphæ can be extirpated.

The External Labia Growing Together.

The two external labia are sometimes united together by a fine line of junction, at the upper end of which are situated the meatus urinæ, and the glans of the clitoris. This sort of malformation is not at all

* Supposing the child to be a female, the probe will pass readily through a short straight canal; but supposing it to be a male, the probe will neither pass in a straight direction, nor without some degree of curvature being given to it, and the canal will be found to be of a considerable length.

common, and is very easily remedied. When the external labia are separated by a slight operation, all the parts behind are found perfect.

The two labia are sometimes joined together by a continuation of the common skin, so that the appearance of labia is entirely lost. This defect may also be remedied by art, and the parts within will be found to be well formed.

The external parts, particularly the inside of the nymphæ, and the vestibulum, are subject to inflammation and ulcers from common causes, and especially from the venereal poison. These diseases, although they are very often the subject of solicitude during life, yet are seldom examined after death, and therefore I shall altogether omit giving an account of them here.

It is unnecessary to subjoin any account of Symptoms to this chapter.

CHAP. XXIV.

DISEASED APPEARANCES OF THE BRAIN AND ITS MEMBRANES.

Inflammation of the Dura Mater.

The Dura Mater is sometimes found in a state of Inflammation. When this is the case, many extremely fine vessels filled with florid blood are seen in the inflamed portion of it, which pass between the dura mater and the cranium. These fine vessels are seldom so crowded as in most other parts of the body when inflamed, which arises from the nature of the membrane itself. In its natural state there are few blood-vessels ramifying through it; and therefore, when it is inflamed, it does not appear so much crowded with vessels as other parts do which are naturally more vascular. Still, however, a person, well acquainted with the natural appearance of the dura mater, would be as much struck with the difference of its appearance when inflamed, as he would be with that of any other part of the body.

The dura mater during a state of inflammation sometimes forms a layer of coagulable lymph, which adheres to its inner surface like an adventitious membrane; but this is very uncommon.

When the dura mater is inflamed, adhesions are sometimes formed between it and the other membranes of the brain, so that for a considerable extent they adhere together; but this appearance of disease

is also rare. The reason why diseased adhesions between the membranes of the brain are rare, probably is, that coagulable lymph is seldom formed upon their surface during inflammation. This may be considered as a kind of peculiarity belonging to the membranes of the brain, for they bear some analogy to the membranes which line the circumscribed cavities of the body, and these last most commonly form coagulable lymph upon their surface when they are inflamed.

It is not unusual, when the dura mater has been inflamed, especially in consequence of some external violence, for suppuration to take place, and pus to be found covering a portion of the membrane.

The dura mater is likewise sometimes eroded by ulceration, but this is by no means frequent; it is more common, after violent injuries of the head, for a portion of it to become mortified.

Scrofulous Tumors Connected with the Dura Mater.

Scrofulous Tumors are sometimes formed, which are connected with the Dura Mater, but this happens very rarely. These resemble precisely the structure of a scrofulous absorbent gland, and occasionally there is found in them a curdy pus.

Spongy Tumors Growing from the Dura Mater.

Spongy Tumors also grow from the Dura Mater, but they are very uncommon. Such tumors, as far as I have had an opportunity of examining them, are pulpy to the touch, and of a distinct fibrous structure.

Bony Matter Formed in the Dura Mater.

One of the most common diseased appearances of the Dura Mater is the formation of bony laminæ in

some part of it. These are generally very small, being not larger than the nail of a finger, but they are also occasionally of a much larger size. They are thin, and frequently very irregular in their edge. They are not to be found indifferently in every part of the dura mater, but are almost always adhering at the superior longitudinal sinus, or its falciform process. In some of them the proportion of the earth to the animal part is larger than in common bone.

There is often one of these ossifications only; but sometimes there are more of them. The falciform process has been said to be occasionally found almost entirely converted into bone; but this last appearance is very rare.

Very strong Adhesions of the Dura Mater to the Cranium.

THERE is at all times a strong Adhesion between the Dura Mater and the inside of the cranium. This adhesion is principally formed by small blood-vessels which pass from the one to the other, and likewise by a close application of the fibrous structure of the membrane to the bone. In a natural state, however, the dura mater can be perfectly separated from the cranium; yet it sometimes happens that the adhesion is so strong as to render it impossible to separate the two completely. The dura mater, in such an attempt, is torn in different parts into two laminæ, one of which adheres to the bone, and the other lies upon the pia mater. Whether this preternatural strength of adhesion arises from a previous state of inflammation in the dura mater, or from some other cause, I cannot determine; but it is not at all an uncommon appearance.

Diseased Appearances of the Tunica Arachnoides.

Diseased appearances of structure are very rare in the Tunica Arachnoides, and have almost been entirely overlooked by writers. The only diseased appearance of this coat which I have observed, is that of its becoming a good deal thicker than it is naturally, so as to be a tolerably firm membrane. In this, as well as in its natural state, no blood-vessels are to be seen ramifying on it; or at least they are extremely few. It is also separated at some distance from the pia mater, by a serous fluid being interposed between these membranes.

Diseased Appearances of the Pia Mater. — Veins of the Pia Mater Turgid with Blood.

The most common diseased appearance of the Pia Mater is that of its veins being turgid with blood. This depends on some impediment to the free return of the blood from the head towards the heart, which may arise from a variety of causes, and is very different from an inflamed state of the pia mater. The smaller branches of its arteries, filled with a florid blood, are not more numerous in this state than is natural, but its veins are much more distended with a dark blood.

The Pia Mater Inflamed.

When the Pia Mater is inflamed, it is upon the whole more difficult to distinguish this condition of it from its natural state, than any other membrane of the body. This depends on the great number of very small vessels which naturally ramify on it. In inflammation of the pia mater, these small vessels are much more

numerous than in its natural state, are filled with a florid blood, and form, by their anastomosis, a beautiful net-work. It does not frequently occur, when the pia mater is inflamed, that it becomes so uniformly red as to show no interstices between its vessels, — a circumstance which happens in the inflammation of some other membranes. The processes arising from the under surface of the pia mater are also more crowded with vessels than usual, and there is a stronger adhesion between them and the substance of the brain.

It very rarely happens that any layer of coagulable lymph is formed in the inflammation of the pia mater, which is so very common in inflammation of the pleura and the peritonæum. When the pia mater is inflamed to a high degree, pus is commonly formed; I have seen it effused over the whole upper surface of the brain, in consequence of an inflammation of the pia mater.

Close adhesions, over a large extent of surface, have been seen between the pia and dura mater, which are probably the consequence of inflammation; but these are rare, and have not fallen under my own observtion. Adhesions, however, of a small extent are not very uncommon.

Scrofulous Tumors Adhering to the Pia Mater.

I HAVE seen a number of Scrofulous Tumors adhering to the inside of the Pia Mater. They exhibited the true scrofulous structure, such as has often been explained, and are very uncommon.

Air in the Vessels of the Pia Mater.

IT is not unusual to find some of the vessels of the Pia Mater filled with Air. This may be generated by

putrefaction, but it is also sometimes seen when no process of this kind appears to have taken place. Under such circumstances, it is probable that the air is extricated by some new arrangement in the constituent parts of the blood.

Hydatids of the Pia Mater.

Little cysts * containing water, which are generally called Hydatids, have been seen adhering to the Pia Mater; but this is a very rare appearance of disease.

Part of the Pia Mater Bony.

It occasionally happens, although I believe very seldom, that a portion of the Pia Mater is converted into Bone. It has not occurred to me to observe such a change of structure in this membrane, but Soemmerring mentions that a specimen of this disease is preserved in his Museum.

Diseased Appearances in the Substance of the Brain.— Inflammation.

The substance of the Brain, under which I include both the cerebrum and cerebellum, is liable to Inflammation, although it is not very common, when the head has received no external injury. When inflammation takes place, it is rarely extended over any large portion of the brain, but is rather confined to one or more distinct parts of it. In this state of disease the inflamed portion becomes of a red colour, although this is seldom very intense. When cut into, the co-

* Vid. Lieutaud, tom. ii. p. 145.

lour is found to arise from a great many small vessels, which are filled with blood. If the inflamed portion be on the surface of the brain, the membranes in the neighbourhood are also commonly inflamed. The part which is inflamed has no peculiar hardness, but yields nearly the same sensation to the touch, as it would do in a healthy state.

Abscesses of the Brain.

Inflammation of the Brain frequently advances to suppuration, and Abscesses are formed in it. When these are of a large size, the weight of the pus breaks down the structure of the neighbouring parts, and they look as if they had been simply destroyed, or very much injured by the pressure. When the abscesses are small, there is an ulcerated appearance of the cavity in which the pus is contained.

Gangrene of the Brain.

Portions of the Brain occasionally become gangrenous, especially after violent injuries of the head; but I believe this appearance of disease is extremely rare where an inflammation of the brain has taken place from any other cause. I have met, however, with one instance of this; a portion of the brain at the inflamed part was of a very dark brown colour, and as soft as the most rotten pear.

The Brain very Soft.

It is extremely common, when the brain is examined several days after death, to find such a Softness of its substance, that it can hardly admit of being cut so as to leave a smooth surface, and the smallest pressure of

the finger breaks it down into a pultaceous mass. The brain, however, will sometimes retain, for several days, the firmness and resistance which it had during life; yet this is by no means common. Neither of these appearances is to be considered as produced by disease.

Sometimes, however, a part of the medullary substance of the brain becomes morbidly soft, and loses its natural texture, acquiring nearly the consistence of custard. Dr. John Hunter, physician to the army, has observed this in the medulla of the hemispheres of the brain, near the lateral ventricles. He has also met with this appearance in cases of fatuity, where the persons were advanced in life; and likewise combined with effusions of blood in apoplexy. I have also met with one or two instances of the same diseased change of structure in a part of the medullary substance of the brain.*

The Brain very Firm.

The Brain is sometimes found to be considerably firmer than in its healthy state, to be tougher, and to have a greater degree of elasticity; it will bear to be pulled out with some force, and will readily re-act so as to restore itself, or, when pressed, it will recover its former shape. Under such circumstances the ventricles are sometimes found to be enlarged, and full of water. The brain has even been said to become so hard and dry as to be friable between the fingers; and the medullary substance, in these cases, is represented as

* The Softening of the Brain, and the peculiar symptoms which accompany it, have lately been described with great accuracy both by Lallement and Rostan, to whose excellent works the reader is particularly referred. (*Ed.*)

being much lighter than in the natural state. It is probable, however, that these accounts are a good deal exaggerated. It has been remarked, that in such cases the cerebellum is not very often affected.

A White Firm Substance Formed in the Brain.

It is not very unusual to see a White Substance formed in the Brain, of an uniform smooth texture, and possessing a considerable degree of hardness. The brain adheres to this substance, and often appears round its edges more vascular than usual. The substance is scrofulous in its nature, for I have had an opportunity of seeing it converted into a scrofulous pus. More than one of these substances are frequently formed in the brain.

It is also not unusual to find rounded masses of the same sort of substance lying as it were imbedded in the brain, or in its interstices; some of these I have seen as large as a walnut. When such tumors are formed in the brain, it happens frequently, that there is an increased quantity of water in the lateral ventricles.

Encysted Tumors and Hydatids in the Brain.

Encysted Tumors containing a serous fluid * have sometimes been found in the substance of the Brain; but they are very uncommon, and have never come under my observation.

In one instance, I have been informed, from good authority, that Hydatids were accumulated in the lateral ventricles of the brain; but this is still a more

* Vid. Lieutaud, tom. ii. pp. 194, 195.

uncommon appearance of disease than the other. They seemed to be of the same nature with hydatids of the liver. *

Bony Tumors Pressing upon the Brain.

Bony Tumors are sometimes formed in the cranium, which press upon a part of the Brain. They most commonly consist of an irregular mass, which is formed of bony processes, with a fleshy substance filling up the interstices between them. Of this sort of tumor there are several examples in William Hunter's Museum.

It has sometimes happened, but very rarely, that all the Bones of the Cranium have become extremely thickened, and have encroached, by their growth, on the cavity which contains the brain. Of this there is a remarkable specimen in John Hunter's Museum, where the bones of the cranium are at least three times as thick as in the natural state. They are also, in the case to which I allude, much more spongy in their texture than usual.

A nodule, of a substance having the appearance of Ivory, has also been known to be formed in the Bones of the Cranium, and to protrude considerably into its cavity. This occurs very rarely, but a specimen of it is also preserved in John Hunter's Museum. Whatever may be the variety in the morbid processes which produce these changes of structure in the bones of the cranium, their effects on the functions of the brain

* This case was communicated to me by Mr. Burnall, who attended the patient, and examined the appearances after death.

must be nearly the same, as they all form a permanent cause of compression.

Bony Ridges Irritating the Brain.

On the inner surface of the basis of the cranium there is always some irregularity. This consists in numerous ridges and small eminences, with depressed surfaces interposed between them. It happens occasionally that there is a morbid growth of these eminences and ridges, forming sharp spicula and sharp edges of bone. These run into the brain, and irritate very violently the nervous system.

Hydrocephalus.

One of the most common appearances of disease in the Brain, is the accumulation of Water in its Ventricles.* This generally takes place when a child is very young, and even sometimes before birth. The water is accumulated in greater or less quantity in different cases. It sometimes amounts only to a few ounces, and occasionally to many pints. When the quantity of water is very considerable, the fornix is raised at its anterior extremity in consequence of its accumulation, and an immediate opening of communication is thereby formed between the lateral ventricles. From this cause, too, a part of the water passes very readily into the third ventricle, and from thence into

* Sir Everard Home has known an instance where water was accumulated in large quantity in the third ventricle, and had forced its way between the fine laminæ of the medullary substance which compose the septum lucidum, without escaping into either of the lateral ventricles. This may be said to be a new situation of hydrocephalus, and is of very rare occurrence.

the fourth. The water is of a purer colour, and more limpid, than what is found in dropsy of the thorax or abdomen. It appears, however, to be generally of the same nature with the water that is accumulated in both of those large cavities. In some trials which I have made, it partly coagulated on the application of the common acids, exactly like the water in hydrothorax and ascites, or like the serum of the blood. But there is much variety in the quantity of the coagulable matter. In some instances the water in hydrocephalus contains a small proportion of coagulable matter, and in others it is almost entirely free from it.

When water is accumulated in the ventricles to a very large quantity, the substance of the brain, especially on the sides and at the upper surface, is so thin, as almost to appear to be a sort of pulpy bag, containing a fluid. The scull too, on such occasions, is very much enlarged, and altered in its shape. The cranium is exceedingly large in proportion to the size of the face. The projections are very considerable at the centres of ossification from whence the frontal, parietal, and occipital bones were originally formed, and the membranous divisions between these several bones are very wide. When the scalp is removed, so as to give an opportunity of looking immediately upon the cranium, the bones are found to be very thin, often not thicker than a shilling, and there are frequently broad spots of membrane in the bone. The reason of this last appearance is, that ossification takes place in many points of the membrane in such cases, in order to make a quicker progress, but the water accumulates too rapidly, so that spots of membrane are left not converted into bone. When such appearances take place

in hydrocephalus, the disease has been of long continuance; occasionally for some years.

Water on the Surface of the Brain, and between its Membranes.

WATER is also sometimes formed under the pia mater, and on the surface of the Brain, but very rarely in any considerable quantity. There is, generally, at the same time a greater quantity than natural in the ventricles.

The most common situation of water between the membranes of the brain is between the tunica arachnoides and the pia mater. In this case the water is commonly effused in small separate portions between these two membranes; and at other times is effused over a large extent. The fluid, when seen through the tunica arachnoides, appears commonly like a very thin jelly, but it is always fluid, and resembles the serum of the blood. The blood-vessels of the pia mater are generally in such cases more distended with blood than is natural, but this does not not always occur. The tunica arachnoides is generally thicker than natural, and has a certain degree of opacity. Sometimes there is a little more water than usual in the ventricles of the brain, and sometimes there is only the natural quantity. Not unfrequently in these cases there is more or less water in the theca vertebralis; but this does not happen, except when the quantity of water effused between the tunica arachnoides and the pia mater is considerable.

It is related by authors, that water has been formed occasionally between the dura mater and the cranium.*

* Vid. Lieutaud, tom. ii. pp. 229, 230.

From the nature of the adhesion between the cranium and this membrane one would not easily be led to suspect an accumulation of water between them, and such cases are at least to be considered as very uncommon.

Air between the Membranes of the Brain, and in its Ventricles.

Air has been said to have been sometimes collected in considerable quantity between the Membranes of the Brain, and even in its Ventricles. I do not recollect to have observed either of these morbid appearances, and I believe them to be extremely rare.*

Blood Effused or Extravasated.

Blood is frequently found effused within the cavity of the cranium in various situations. It may either be poured out by the rupture of some vessels in the substance of the brain itself, or into some of the ventricles. It is frequently effused on the surface of the brain, or on some of its membranes. This is most apt to happen where the effusion is in consequence of external violence.

The quantity of blood which is effused from the rupture of vessels in the brain is frequently very considerable. It is commonly found in a coagulated state, and the texture of the brain in the neighbourhood is often very much injured from the pressure. Blood is not equally liable to be effused into every part of the substance of the brain. Where an effusion has taken place without external injury, it is almost constantly found in the medullary part of one of the hemispheres,

* Vid. Portal's Anatomie Médicale, tom. iv. pp. 70, 71.

and often near the lateral ventricles, so that a quantity of blood has at the same time escaped into one or both of these cavities. It sometimes happens that the brain is very soft in its consistence at the place of this effusion, — a remark which has been made by Dr. John Hunter.*

When blood is extravasated within the cavity of the cranium from some external injury, the vascular system is usually sound, except for the rupture which may have happened. But when extravasation happens within the cavity of the cranium, without external injury, the vascular system of the brain is almost always diseased. It is very common, in examining the brains of persons who are considerably advanced in life, to find the trunks of the internal carotid arteries on the side of the sella turcica very much diseased, and this disease extends frequently more or less into the small branches. The disease consists in a bony or earthy matter being deposited in the coats of the arteries, by which they lose a part of their contractile and distensile powers, as well as of their tenacity. The same diseased structure is likewise found in the basilary artery and its branches.

The vessels of the brain under such circumstances of disease are much more liable to be ruptured than in a healthy state. Whenever blood is accumulated in unusual quantity, or the circulation is going on in them with unusual vigour, they are liable to this accident, and accordingly, in either of these states, extravasations of blood frequently happen. Were the internal carotid arteries and the basilary artery not

* See p. 326.

subject to the diseased alteration of structure which I have described, effusions of blood within the cavity of the cranium, where there has been no previous external injury, would probably be much more rare.

Cavities in the Brain Containing a Serous Fluid.

Cavities containing a serous fluid are sometimes observed in the substance of the Brain. They almost constantly occur in the medullary part of the hemispheres, and the substance of the brain immediately surrounding these cavities is tough and smooth, so as to resemble a membrane. They would appear to be the remains of the cavities formed by extravasated blood in cases of apoplexy, where the patients have not been immediately cut off, but have afterwards lived for some months or years. The extravasated blood would seem in such cases to have been dissolved, and taken up by absorption; but the injury is not repaired, and a cavity remains afterwards, filled with a serous fluid.

Aneurism of the Internal Carotid Arteries on the Side of the Sella Turcica.

The Internal Carotid Arteries are very apt, in persons of an advanced age, to become ossified, and the same morbid change may be traced along their branches. It occurs, however, very rarely that they are distended at any part into an aneurismal sac, like the arteries in some other parts of the body. I have been informed of an instance of this kind, where both the internal carotid arteries, on the side of the sella turcica, were distended into a little aneurism. One of these aneurisms was about the size of a cherry, and

the other was somewhat smaller. It is remarkable that in the only two instances which have come to my knowledge, of aneurisms being formed in the arteries of the head and brain, there has been an aneurism in both arteries in the same situation and at the same time. I once met with an aneurism in each of the carotid arteries at the origin of the internal carotids; and in the case just described, there was an aneurism in each of the two internal carotid arteries on the side of the sella turcica.

Diseased Appearances of the Plexus Choroides.—Little Bags in the Plexus Choroides.

The most common diseased appearance of the Plexus Choroides is that of little round transparent bags, which adhere to it, and which have commonly been called hydatids. They are generally more transparent in their coats than hydatids, are commonly about the size of a garden pea, but sometimes they have been seen as large as a gooseberry. From several examinations of them which I have made, they seem to be formed by a distension of the vein which runs along the edge of the plexus choroides. I have been able to distend them fully with air, by making an opening into this vein, and inflating through a small blow-pipe.

Round Tumors Adhering to the Plexus Choroides.

Tumors sometimes adhere to the Plexus Choroides. They are small, of a round shape, and occur but rarely. They seem to be of the same kind with the round tumors which are sometimes found imbedded in the brain, and which I believe are scrofulous.

Diseased Appearances of the Pineal Gland. — Earthy Matter in the Pineal Gland.

A LITTLE earthy matter is almost constantly found in the Pineal Gland. It is sometimes in very small quantity, but not unfrequently the quantity is very considerable. The particles of the earth do not adhere strongly together, but are easily separable by pressure between the fingers. This earthy matter consists chiefly of phosphate of lime *, and is so commonly found in the pineal gland, that it cannot well be considered as a disease. I think, however, that in some instances I have found this gland without any deposition of earthy matter.

Pineal Gland said to be Scirrhous.

THE Pineal Gland has been mentioned by authors as being sometimes scirrhous. I have felt it on some occasions a little firmer than on others; but it has never occurred to me to observe that alteration of structure in it which could be properly called scirrhus, and I believe it to be a very rare disease.

Water in the Pineal Gland.

THE Pineal Gland has been found to be very much distended with a limpid Water †; but this is very uncommon.

Diseased Appearances of the Pituitary Gland.

THIS gland is very little liable to be affected by disease. It has only occurred to me to observe in it one morbid change. It was, in that case, enlarged to

* See Thompson's System of Chemistry, vol. iv. p. 658.

† Vid. Morgagni, epist. lxii. art. 15.

twice its natural size, and was converted into a substance, possessing an obscurely fibrous structure.

Diseased Appearances of the Nerves.

It rarely happens that any of the nerves within the cavity of the cranium appear diseased. I have, however, sometimes seen a nerve a good deal smaller than natural, softer in its texture, and of a less opaque colour; this I recollect to have been particularly the case with one of the optic nerves in a person who was blind of one eye.*

The nerves vary a good deal in their size in different persons, without there being any disease whatever.

Malformations of the Brain.

These are the principal diseased changes which take place in the Brain and its appendages. I have just to add, that the brain is subject to great variety from original malformation. A great part of the cerebrum is sometimes wanting, while the cerebellum and the medulla spinalis are entire; sometimes there is hardly any vestige of either the cerebrum or cerebellum, and the medulla spinalis is very much diminished in size: at other times there is a total want of the brain, and there is no appearance of the medulla

* I have seen an instance of a considerable Tumor formed in a Nerve. The tumor was very solid in its texture, of a yellowish white colour, and larger in its size than a goose's egg. The nerve seemed to be in some measure lost in the tumor, and in one part of it a fibrous structure could be observed pretty distinctly, similar to that of a nerve. This swelling occurred in one of the axillary nerves, and was extirpated by Sir Everard Home.

spinalis. In this case, one should expect a want of nerves throughout the whole body. It is, however, not so; nerves are found distributed in the common way, through the limbs, and the dorsal nerves can be seen arising from a membrane somewhat resembling the dura mater in the canal behind the vertebræ. When there is a total want of brain, it sometimes happens that there is a medulla spinalis, which, however, is of a very small size. In cases of deficiency in the brain, the cranium is nearly on a level with the two eyes, and there is often on the scalp a soft spongy excrescence. This is generally divided into distinct protuberant masses, and is covered with a fine skin, capable of being rendered very vascular by injection. When cut into, the spongy excrescence consists of pretty large cells which are filled with a sort of grumous matter.

There is also frequently, instead of this excrescence, a bag growing from the skin of the scalp, and passing downwards so as to cover more or less of the back of the trunk. This bag sometimes consists of a fine membrane, with little strength; and sometimes it is rather thick, with considerable firmness. It sometimes communicates with the cavity of the cranium by a considerable opening; and sometimes the communication is very small. It is filled with an aqueous fluid, and in some instances there is also in it a portion of brain.

SYMPTOMS.

Inflammation of the Dura Mater is not distinguished by any peculiar Symptoms. The symptoms which belong to it, are the same with those which

attend inflammation of the other membranes, and even differ but little from the symptoms which take place in inflammation of the brain itself. The symptoms are, pain in the head, delirium, symptomatic fever, and sometimes convulsive motions.

When Tumors have been found adhering to the Dura Mater, or the other membranes of the brain, a long continued pain in the head has commonly been remarked, sometimes delirium, sometimes convulsions, and sometimes, it has been said, the ordinary symptoms of apoplexy.

Where Bony Matter has been formed in the Dura Mater, with sharp processes growing from it, convulsive motions have very commonly occurred in various parts of the body, often a continued pain in the head, sometimes delirium, and sometimes temporary fits of insanity.

In cases where the Veins of the Pia Mater have been found turgid with blood, stupor has very frequently occurred, sometimes delirium, and sometimes, even apoplexy in its perfect form.

The Symptoms of Inflammation in the Pia Mater, are the same with those which attend inflammation of the dura mater, and they have been already noticed.

In Inflammation of the Substance of the Brain, there is pain in the head, delirium, symptomatic fever, and sometimes coma.

Where an Abscess has been formed in the Brain, pain, delirium, and coma have been remarked, sometimes a paralysis of a part of the body, and sometimes convulsions. The last symptom has been observed most frequently to occur when the abscess has been formed in the tuberculum annulare, or in the medulla oblongata, or in the neighbourhood of these structures, so that the pus could affect them by its pressure.

Where the Brain has been found to be more firm and elastic than is natural, mania has often been known to have occurred. I have, however, been informed, from the best authority, that this state of brain is not common in maniacs; and that in them it is generally not more firm, nor more elastic, than in people whose minds have always been sound.

The Symptoms which have been observed to attend the formation of solid, or Encysted Tumors in the Brain, are a permanent pain in the head, which is occasionally very violent, sometimes delirium, sometimes convulsions, and sometimes, it has been said, the common symptoms of apoplexy. It is worthy of remark here, that when tumors of any kind press upon the thalami nervorum opticorum, or the optic nerves themselves, within the cranium, vision generally becomes impaired in various ways; and that when tumors press upon the tuberculum annulare, or the medulla oblongata, convulsions are very apt to occur. I have known one case in which the optic nerves at their junction were pressed by a tumor as large as a gooseberry, and yet the pupils were not dilated, nor the eye-sight impaired, till within a day or two of the person's death.

There was only a very violent pain in the fore part of the head.

In the case where Hydatids were accumulated in the Lateral Ventricles, the person had been subject for a long time to pain in his head, which was often violent, and towards the close of the disease, had several convulsion fits, in one of which he expired. Neither his sight nor hearing were impaired.

The Symptoms of Hydrocephalus, are a pain in the head, stupor, convulsive motions, picking of the nose, grinding of the teeth during sleep, occasional flushings of the face, a motion of the head occasionally upon the pillow from one side to the other, occasional sighing, and towards the latter end of the disease, a dilatation of the pupils and squinting. The patient is commonly affected with sickness, and the bowels are with difficulty acted on by purgative medicines. In the beginning of this disease, the pulse is frequent but regular; when the disease has made a further progress, it is slow and irregular; and towards the latter end of the disease, it becomes again more regular and frequent. When the progress of the disease has been very gradual, and the patient has continued to live for some months, or even years, the functions of the brain have been found, in many instances, to be less impaired till near its close than might have been expected.

Where Blood has been effused on any of the Membranes of the Brain, the patient is more or less in a comatose state, according to the rapidity of the effusion, or the different susceptibility of the brain in dif-

ferent individuals to be affected by pressure. Innumerable instances show, that functions of the brain will be impaired in very different degrees, from the same apparent degree of injury.

When blood is effused into the substance of the brain, apoplexy is produced, which is attended with the following symptoms, viz. coma; generally stertorous breathing; a paralysis, commonly of one half of the body; and often convulsive motions. The pulse is slow, full, and generally very strong. When the patient is not cut off at once, but lives for some time after the attack, the hemiphlegia, which is almost constantly an effect of this disease, is generally on the opposite side of the body from that of the brain in which the effusion of blood has taken place. This should seem to show, that the right side of the body derives its nervous influence from the left side of the brain, and the left side of the body its nervous influence from the right side of the brain. In a few instances, however, the hemiphlegia has occurred on the same side of the body with the effusion.*

* Dr. John Hunter has made some very accurate dissections relative to Apoplexy, and its consequences, which formed the subject of the Gulstonian Lectures, read by him, 1796. By these lectures, I have been enabled to give a more satisfactory account of the appearances connected with this disease, than I could otherwise have done.

THE END.

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