

the *hyperæmia* is less intense and less strictly concentric than in acute inflammation.

The characteristics of this state, for which a new term is wanted, are—

1. **Enlargement** of the **bloodvessels** of a part (chronic hyperæmia), with the flow of a large amount of blood through it.
2. Exaggeration of the **sensibility** of the part (hyperæsthesia) and morbid irritability.
3. **Deficient** or irregular **functional power**.
4. Unusual **proneness** to acute or subacute **attacks of actual inflammation**.

For this familiar combination of pathological elements I propose the name **hyperæmæsthesia**.

It has, with some, been usual to designate it by the term "**irritable**," in connection with the name of the particular part affected, thus—

Irritable uterus ;  
Spinal irritation ;

to which I would add—

Irritable eye (chronic ophthalmia),  
Irritable stomach (chronic gastritis) ;  
Irritable brain, etc.

#### DEGENERATION.

Degeneration has been already defined as **qualitative atrophy**; *i. e.*, a substitution, under decline of the organic force incessantly active in nutrition and repair, of *abnormal* for *normal* structure and material.

The forms under which this occurs are—

Fatty degeneration ;  
Calcification ;  
Pigmental degeneration ;  
Fibroid, colloid, or amyloid degeneration ;<sup>1</sup>  
Liquefactive and corpuscular degeneration.

In regard to all of these except the last, it may be stated (see *Paget's Surgical Pathology*) that

1. They are changes such as may be observed **naturally occurring**, in one or more parts of the body, at the **approach** of the natural **termination of life**.
2. The new material is of **lower chemical composition** than that normal to the part; *i. e.*, it is less removed from the inorganic state: as fat, gelatin, calcareous matter, etc.
3. In **structure**, it is **less developed**; being crystalline, granular, simply globular, etc.
4. In **function**, it is **less powerful**.

<sup>1</sup> *Amyloid* degeneration has been described by Virchow and others, as occurring in the brain, spleen, liver, etc. It consists in the conversion of tissue into a substance having physical and chemical properties resembling those of starch or cellulose. Such material is made reddish-brown by iodine, instead of yellow, as the healthy tissues would be.

5. In **nutrition**, it is **less active** and capacious.

6. *Generally*, although *not always*, **constitutional debilitation precedes**, and (we may infer) institutes the local alteration of structure.

7. *Inflammation* or other *local disease* may, by *impairing the nutrition* of a part, **cause** it to degenerate.

The form of degenerative disease which has received the most attention from pathologists is **fatty degeneration**. This has been carefully studied, as it occurs in the heart, arteries, brain, muscles, bones, liver, kidneys, and morbid products. It must be distinguished carefully from mere **fatty accumulation** or adiposity.

Our knowledge of the facts concerning degenerative disease, and of the share which it claims in the domain of structural pathology, once almost entirely usurped by inflammation, is among the most important of the acquisitions of the medical science of the last third of a century.

#### MORBID GROWTHS.

**Tumors**, and morbid growths benign and malignant, which may be best classified as forms of structural degeneration or vitiated nutrition, I leave, at present, except some brief consideration of the pathology of cancer.

**Cancer** falls under the notice and care of the medical practitioner, when it attacks parts or organs within any of the great cavities of the body.

There is no essential impropriety in classing, pathologically, *all malignant* growths<sup>1</sup> together as cancerous; their *subdivisions* being clinical or surgical. (By *malignant*, we mean prone to unlimited increase: disastrous in effect or result; and difficult or impossible of arrest or cure.)

Cancers may, then, be divided simply into

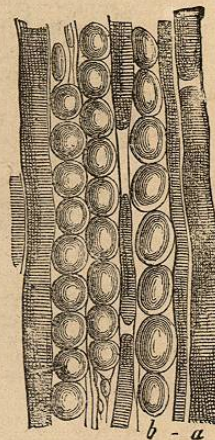
Scirrhus, or hard cancer (fibro-carcinoma);  
Colloid, or gelatiniform (alveolar) cancer;  
Encephaloid, or brain-like (medullary) cancer.<sup>2</sup>

Each of these contains, as its anatomical elements, **fibres, fluid, or semi-fluid jelly, and cells**.

**Scirrhus** is composed mainly of a fibrous or filamentous tissue, with little fluid, and comparatively few cells. It never becomes encephaloid, nor does encephaloid cancer ever become scirrhus.

**Colloid** cancer has a variable amount of fibrous tissue, arrayed as a *matrix* (compared often to the structure of an orange), con-

Fig. 10.



Fatty infiltration.

<sup>1</sup> Tubercle is not a *growth*, but rather an *abortion* of tissue.

<sup>2</sup> Other names are used, as *epithelial, melanoid, osteoid, hæmatoid, myeloid*, and *villous cancer, enchondroma, spindle-celled and giant-celled sarcoma*, etc.

Fig. 11.



Cells of cancer of tongue.

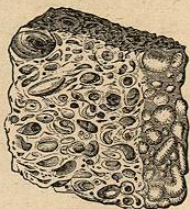
taining a *jelly-like* substance; cells also may be found in it, but in less proportion.

Fig. 12.



Colloid, exterior.

Fig. 13.



Interior of colloid.

**Encephaloid cancer** is (so to speak) the *highest development* of carcinomatous formation. It consists of a fibrous matrix, containing an abundance of abnormal, multiform cells, and a peculiar fluid.

When a cancer, of either type originally, is based upon and includes bony structure, it constitutes *osteo-sarcoma*. If it develop itself upon the skin, or other epithelial tissue, or, wherever occurring, display similar structure, it may be called *epithelioma*. If its location involve especial *vascularity* and hemorrhage, it assumes

the form and name of *fungus hæmatodes*. The *pain* of cancer (which is not always present) appears to depend upon the extension of the disease to a tissue well endowed with *nerves*.

Fig. 14.



Myeloid sarcoma. (Virchow.)

The cells, fibres, and fluid<sup>1</sup> of cancer are all *abnormal*.

Cancer-cells are of *various* shapes, resembling gland-cells, but larger, averaging about  $\frac{1}{1000}$  of an inch in diameter.

But are these forms *heterologous*; *i. e.*, different from anything normal or natural to the body? Are they, so to speak, *implantations*, or *distortions*? I believe, fully, that the latter is the correct view. The "cancer-cells" are no longer held by micrologists to be pathognomically distinctive; they are *homologous* with other cells found in the body. Yet, they are such forms as *do not normally belong to the part*; being produced by morbid alteration or perversion of its natural elements; especially the *epithelial* elements.

<sup>1</sup> The milky or creamy "cancer-juice," which emulsifies with water, is considered highly characteristic by many observers. The *malignity*, or proneness to increase, and extend destructively, of a tumor, is generally in proportion to its succulence or juiciness.

They are, moreover, *crowded together* abnormally, in the meshes of an imperfectly and irregularly distributed connective tissue. Classen's opinion (1870) that cancer always originates in a morbid development of *migrated leucocytes* (white blood-corpuscles) is extremely unlikely to be correct. The view of Thiersch (1865) and Waldeyer (1867), ascribing cancerous growths to a modification in the cell-multiplication of ordinary epithelium, is more probable. This view is favored also by Rindfleisch; who, however, admits as one mode of growth of epithelial cells, their derivation from wandering formative cells, in contact with existing epithelium.<sup>1</sup>

The most rational theory of cancer is *dynamic*. The disease consists in a morbid **tendency**; a tendency to enormous and unhealthy growth of a formation which is, at the same time, vascular and sensitive, showing subserviency, although under *perversion*, to the physiological laws of the organization.

The origin of cancer in most cases, is **constitutional**; it is frequently *hereditary*. A cancerous *cachexia* is recognized in very many cases; its most obvious sign is a peculiar sallowness of the skin. It follows much more rapidly upon cancers of the *viscera* than upon those of external parts.

Fig. 15.



Colloid cancer. (Rindfleisch.)

Genuine cancer may always be expected to return after removal—although exceptions occur, and it has occasionally been known to undergo spontaneous degeneration.

The order of choice which cancer exhibits, as to the parts it attacks, is (Rokitansky) as follows:—

<sup>1</sup> It is a proposition not yet absolutely proven, that "wandering leucocytes" take part in the formation of any *tissue* whatever. I believe it to be extremely doubtful.

Uterus;	Liver;	Testicle;
Mamma;	Bones;	Ovary;
Stomach;	Skin;	Tongue;
Rectum;	Brain;	Œsophagus.
Lymph-glands;	Eye;	

*Colloid cancer*, in particular, prefers the Stomach, rectum, peritoneum.

*Scirrhus*, the Mamma, stomach, intestines.

*Encephaloid* may occur in any organ; it *alone* attacks the Liver, kidney, lung, testicle, eye, lymph-glands.

## NEUROPATHOLOGY.

The pathology of the **nervous system** is, itself, an extensive field, of which the merest *coup d'œil* is possible here.

For the purposes of pathological study, we must remember that the *anatomical* elements of the nervous apparatus are—1, gray, vesicular; and 2, white, tubular; and 3, gray, gelatinous nervous substance; the first being arranged in *ganglia*, the latter two in *nerves* and *commissures*.

Physiologically, the functions of the *ganglia* (nerve-centres, and, probably, impressible *peripheral* ganglionic expansions also) are, to *receive*, *reflect*, *accumulate* (generate?) and *distribute* nerve-force. The sole function of *nerves* and *commissures* is, to *transmit* or *conduct* it.

As a whole, we may state the offices of the nervous apparatus to be as follows:—

Excito-motor;	Internuncial, <i>i. e.</i> ,
Excito-secretory;	Sympathetic and
Sensory;	Synergic (co-ordinative);
Voluntary motor;	Psychical, <i>i. e.</i> , mental.

The primary disorders to which this apparatus is liable, are (see *Simon's Lecture on Pathology*):—

1. **Anæsthesia**; *i. e.* that condition in which the patient remains without cognizance of impressions made on a surface which is normally sentient. This may result, *a*, from disease of the nervous expansion at the **surface**; *b*, from disease or injury of the **conducting nerve**, somewhere on its track; *c*, from disease of the **cerebral sub-centre** of sensation (sensorium). The *thalami* are believed by physiologists generally to be the *aggregative* centres of sensation; and local lesion (apoplectic clots, tumors, softening, etc.) in or near them is frequently associated with hemiplegia, etc. The paralysis is commonly observed (from *decussation* of the nerve fibres in the medulla oblongata and cord) on the side *opposite* to that on which the lesion has occurred.

2. **Subjective** impressions and sensations; *i. e.*, those which affect the consciousness of the individual *without the action of any external or peripheral cause*. These subjective impressions may be divided into—*a*, those which are **central** in their origin, as when disease of the optic thalamus causes neuralgia of the fifth pair of nerves; and *b*, those whose origin is **intermediate**; as, when in-

inflammation of the *sheath* of a nerve, or disease of the *spinal axis*, gives rise to pain referred by the patient to the *termination* of the nerve.

Subjective *hyperæsthesia*, or perversion of sensibility or psychological impressibility, may be, in its causation (as regards the nervous apparatus), either *functional*<sup>1</sup> or *organic*; and the difference between these is often practically important.

3. **Muscular Paralysis**; or that condition in which a central volition (or an excitation equivalent to it) fails to produce its normal effect of muscular contraction. Of this defect, also, the pathological origin may be, as to its seat, either *peripheral*, *intermediate*, *subcentral* (in the corpora striata or cerebellum), or *central* (in the convolutions of the cerebrum). Muscular as well as sensational paralysis, dependent on an affection of the brain, occurs on the *opposite side* to that of the encephalic lesion. Scarcely ever is palsy confined *exclusively* to sensation or to voluntary motion—although the *proportion* of impairment of the two functions may vary considerably in particular cases. Both kinds are occasionally *reflex* (Brown-Séguard).

4. Involuntary contraction of voluntary muscles, or **convulsion**. Only very *local*, and usually *transitory* spasmodic affections are (unless reflex) *peripheral* in their origin. Usually, convulsive affections are accounted for by functional excitement of the (spinal) **motor centres**; the causation of which is made up of three elements, in variable proportion, viz.: *a*, morbid **irritability** of the *spinal excito-motor apparatus itself*; *b*, imperfect *control* over the *subordinate nervous centres* by the **brain**, from an abnormal condition of the latter; *c*, the disturbing influence of a **peripheral irritant**—as, tension of the gums in teething, worms in the bowels, undigested food in the stomach, etc.

The three forms of spasmodic disturbance to which the muscles are liable under a morbid alteration of innervation, viz., the **tonic**, **choreic**, and **clonic**, are illustrated respectively in **tetanus**, **chorea**, and **epilepsy**.

5. **Excito-secretory action** (Longet, Campbell) becomes morbid under conditions like those which produce convulsion; for example, the diarrhoea of infants, so common at the time of dentition.

A subject of great interest, almost neglected until within the last dozen years, is that of the effects of various agencies, *through the nerve-centres*, upon the **bloodvessels**. But while the *vaso-motor nerves* are now recognized, and their special relation to the *ganglionic* or sympathetic system is beginning to be appreciated, much confusion on this subject still pervades medical literature.

A further important pathological subdivision exists as to the method of **origination** of those functional disturbances of the nervous system to which we have been alluding.

The source of any of the above forms of nervous disorder, hyperæsthesia, anæsthesia, muscular paralysis, or convulsion, may be (when not purely local) either—

<sup>1</sup> *Functional nervous disorder* results generally (Todd) from an abnormal state of the *blood*. See a valuable lecture on Hyperæsthesia, by Dr. C. Handfield Jones; Brit. Med. Journ., Sept. 30, 1871.

1. Central **organic** disease;
2. Blood-perversion, or defective **nutrition**;
3. Purely **sympathetic** disturbance.

It is far from easy, in many cases, to mark the diagnosis between these different modes of causation of nervous symptoms; but, when the decision has been made, in any instance, the *prognosis* is *most* favorable in the *last* case; less so in the *second*; and most unfavorable in the *first*, *i. e.*, when the symptoms have their origin in an actual organic lesion of an important nerve-centre.

Other subjects (hemorrhage, dropsy, etc.) which might be considered as belonging to general pathology, will be taken up in Part II. of this book.

#### MODES OF DEATH.

Death may occur—

1st. By **asthenia**: the dynamic force of the system being exhausted or destroyed, so that the heart ceases to beat; as in death from old age, lightning-stroke, poisoning by prussic acid, etc. **Syncope** (fainting) simulates or threatens this.

2d. By **anæmia**: the blood being rendered insufficient for life; as from hemorrhage after labor, surgical injuries, bursting of an aneurism, etc.

3d. By **apnoea**, or **asphyxia**; that is, arrest of respiration, either from disease of the lungs, obstruction of the air-passages, deficiency or impurity of the air.

4th. By **coma**; the brain and medulla being made incapable of sustaining innervation; as in apoplexy, opium poisoning, etc.

**Sudden death** may occur from

- Apoplexy;
- Valvular heart-disease (especially mitral);
- Rupture of the heart (or syncope) in fatty degeneration;
- Bursting of an aneurism, or an abscess, within the thorax or abdomen;
- Suffocation;
- Violent mental shock or alarm, producing fatal syncope.

## SECTION II.

### SEMEIOLOGY.

#### I. RATIONAL SYMPTOMATOLOGY.

#### II. PHYSICAL DIAGNOSIS.

**Rational symptoms** and **physical signs** are distinguished (somewhat arbitrarily) thus: a rational symptom is a sign of disease which is obvious to the patient himself or to the practitioner without close inspection. A physical sign is one determined by examination into the properties and material conditions of the organs of the body; as by palpation, auscultation, percussion, etc. Symptoms guide us, generally, by *physiological inference*; physical signs, by *anatomical necessity*.