

attack of acute disease than those who are robust. This is especially true of acute diseases of the respiratory organs; in the vigorous they generally terminate in complete resolution, but tend to recur or to pass into other forms of disease (as caseous degeneration or the various processes resulting in phthisis pulmonalis) in those of a cachectic disposition. In the same way the bronchial catarrh which sometimes supervenes on measles or whooping-cough in weakly children often ultimately spreads to the alveoli. In adults of unsound constitution bronchitis shows a great tendency to return at intervals, to become chronic, and eventually to develop into vesicular emphysema of the lungs, pneumonia runs a longer course, is imperfectly resolved, or ends in caseous metamorphosis, and pleuritic exudations are only partially absorbed, or become the starting point of new morbid processes. It is often of great importance diagnostically to know the constitution of our patient. It enables us, for instance, to distinguish between the onset of caseous pneumonia and that of a simple bronchial catarrh (two conditions which present much the same physical signs), as those who are of untainted constitution are not at all predisposed to destructive changes in the lungs. In this way also, even before making a physical examination of the chest, we can frequently reassure patients who, on account of having a chronic cough, are apprehensive of falling into consumption, as it is certainly but seldom that healthy non-cachectic persons are attacked by this disease.

Well-nourished individuals have firm muscles, an elastic skin, and an ample deposit of fat in the subcutaneous tissue. This development of fat is usually greatest in those who indulge unduly in the pleasures of the table, but is sometimes present to a very considerable degree even in those who are comparatively abstemious; its occurrence is also favoured by a sedentary habit of life, and to a certain extent limited by active exercise. Women often become stouter after the cessation of the menses; and amongst the lower classes the most common cause of obesity is intemperance in the use of alcoholic liquors.

Emaciation usually begins with the disappearance of the subcutaneous adipose tissue; the skin is thus thrown into folds and wrinkles and becomes less elastic, the epidermis is occasionally cast off in the form of branny scales (*pityriasis tabescentium* in

cases of marasmus in children), and the muscles lose in volume and power, so that those who are the subjects of much wasting are for the most part confined to bed. Extreme emaciation is always easily recognisable, though when slight it may be apparent only to the patient himself or his friends. The surest test of this condition, however, is comparative weighing at intervals; in the chronic affections accompanying consumption this method gives the most reliable prognostic evidence with respect to improvement, aggravation, or arrest of the disease.

There is always more or less wasting as soon as the weight of the excreta exceeds that of the food, &c., consumed. Thus it is seen in all diseases which are attended for any length of time by fever (the supply of nutriment being almost stopped and the consumption of albumen increased), in persistent stricture of the œsophagus, chronic catarrh of old standing, dilatation and cancer of the stomach, chronic catarrh and ulceration of the intestines, carcinoma of the liver and other organs, diabetes mellitus, &c. Diseases of the circulation, being almost apyrexial, are unattended by emaciation. In acute miliary tubercle of the lungs there is rapid wasting, chiefly owing to the very high fever which accompanies it; it is most probable also that the wasting which is such a constant and prominent symptom of that form of pneumonia which leads to phthisis pulmonalis is less due to the nocturnal sweating than to the febrile disturbance, as, notwithstanding his almost insatiable appetite, the phthisical patient rapidly loses flesh, but whenever the fever abates, and the progress of the disease is thus temporarily arrested, he at once gains in weight.

Emaciation, apart from its prognostic signification, is of some importance from a diagnostic point of view. Thus, of all the chronic diseases of the lungs, caseous pneumonia is the only one in which it is observed; the other chronic lung affections, however, being almost free of fever, may run their course without being marked by any trace of wasting, though they may give rise to absorption of the parenchyma and to the formation of cavities, and offer therefore the same physical signs as are found in caseous pneumonia; such patients indeed, if only their digestive organs be in good condition, may present every indication of being perfectly well nourished.

The consideration of the changes in the skin and in the general nutrition should always be followed by an

EXAMINATION OF THE SUBCUTANEOUS CELLULAR TISSUE.—DROPSY.

One of the commonest morbid alterations observed in diseases of the chest and abdomen, is *accumulation of fluid* in the subcutaneous areolar tissue (*dropsy, œdema*).

The part so affected becomes swollen, this being always the more marked the more lax the structures invaded,—as in the genital organs. The skin loses its natural colour, and becomes pale, tense, and shining. Pressure with the finger gives the sensation of kneading a doughy mass, and leaves behind a more or less deep depression of the surface. This pitting is produced by the fluid being driven out of certain of the meshes of the subcutaneous tissue into those near it and communicating with it; on the cessation of the pressure the fluid slowly returns and the pit disappears. The obliteration of this pressure mark takes place quickly when the anasarca is slight and recent, but more slowly when it is extensive and of long standing, as in the latter case the skin has almost entirely lost its elasticity from the tension and maceration by the effused fluid. Dropsy is invariably caused by the transudation of the serum of the blood through the veins. There is a certain amount of transudation constantly going on even under normal circumstances, but the fluid is at once absorbed by the lymphatic vessels; it is only when the quantity poured out becomes so great that these vessels cannot carry it off that it accumulates in the cellular tissue.

The causes of the increased transudation of fluid are two,—*undue fulness of the veins and consequent increased pressure on their walls, or an abnormally watery condition of the blood* which gives rise to changes in the walls of the vessels and renders them more easily permeable (Cohnheim and Lichtheim). Dropsy arising from the first cause is designated *Passive dropsy*, as it always originates in obstruction of the current of venous blood; that from the latter cause is known as *Hydræmic dropsy*.

Passive dropsy, when not strictly local, makes its appearance first in the dependent parts of the body, and on both sides,—in the ankles and on the dorsum of the feet. At first, also, the swelling disappears during the night when the patient is in the

horizontal position, the fluid being absorbed by the lymphatics; it returns in the morning, however, as soon as he leaves his bed. In time it tends to become stationary, does not diminish during the night, and mounts by degrees to the legs, thighs, genital organs and the coverings of the chest and abdomen. To this is frequently added effusion of fluid into the peritoneum, pleuræ, and pericardium. It is after this manner that passive anasarca occurs in cardiac diseases in the stage of compensatory disturbance, in which the venous circulation is embarrassed and engorged on account of the constant overloading of the right heart,—as in mitral insufficiency, stenosis of the left auriculo-ventricular orifice, in cases of fatty heart, in tricuspid disease and (seldom) in the later stages of disease of the aortic valves. This variety of dropsy not unfrequently appears in advanced vesicular emphysema of the lungs, and here also is due to the difficulty experienced by the systemic veins in discharging their contents into the over-filled right side of the heart; it is usually confined, however, to the feet, ankles, and lower part of the legs. The most common abdominal causes of venous congestion are diseases of the liver (cirrhosis and cancer) and of the peritoneum (tubercle and cancer); as it is the portal circulation which is most immediately affected ascites is the first dropsical symptom, this being followed by œdema of the lower extremities only when the venous current in the inferior cava is impeded. Ascites alone, or followed after a considerable interval by œdema of the lower limbs, points invariably to disease of the abdominal organs, in men usually to cirrhosis of the liver.

In dropsy from the second cause, *hydræmia*, the watery condition of the blood induces morbid alterations in the structure of the vessels themselves of such a nature that the serum of the blood passes through them more easily than in health. Hydræmia depends either on an *impoverishment of the blood in respect of albumen and fibrin*, or on *retention of water in the circulation from arrest of the cutaneous transpiration or diminution of the secretion of urine*. It is chiefly in connection with acute or chronic diseases of the kidneys that the blood is found to be poor in albumen; in those affections also the increased blood-pressure within the renal vessels occasions albuminuria. The dropsy of recent renal disease is

distinguished from the passive dropsy of cardiac affections by the fact that it usually shows itself first in the face, particularly in the lower eyelids, and by its tendency to vanish from these parts and to reappear in other situations, as the lower limbs and the backs of the hands. It subsequently loses this metastatic, migratory character, and in the later stages of chronic nephritis becomes stationary; it is then most marked in the lower extremities, spreads upwards gradually so as to involve more and more of the limbs and trunk, and sometimes, like the passive cardiac dropsies, gives rise, even at a comparatively early period, to effusion into the serous cavities.

Dropsy from hydræmia is observed in cases of insufficient nutrition (*œdema pauperum*), which, however, are unaccompanied by albuminuria, and in exhausting diseases, such as the last stages of phthisis. Most commonly the œdema does not mount higher than the middle of the leg, being often confined to the region of the malleoli or the dorsum of the feet. The urine may be perfectly free from albumen, but should it be present, especially in phthisis, it indicates renal complication, usually of the amyloid variety.

One of the most serious complications of scarlet fever in the stage of desquamation is the occurrence of dropsy and reduction of the quantity of urine secreted, with or without actual renal disease. When the kidneys are not affected no trace of albumen or organic deposit is to be found in the urine; the cause of the dropsy in such cases most probably is the retention of water in the blood, arising partly from the diminution of the renal secretion, but principally as the result of the disturbance of the cutaneous transpiration. It sometimes happens that sudden suppression of the perspiration from exposure to cold or wet, in persons previously in perfect health, is followed by rapidly developed general anasarca.

Dropsy of a *local* character, apart from a few cases originating in certain inflammatory conditions of the subcutaneous tissues, is always caused by occlusion of one of the larger venous trunks and arrest of the current of blood within it. This closure is usually dependent upon the formation of coagula or thrombi in the veins, from the slowness of the circulation in the very old and weak, or in those who are much exhausted by prolonged illness or confinement to bed,—*Marantic Thrombosis*. Thrombi

are most often formed in the saphenous and femoral veins, more frequently on one side only than on both, and if the dropsical effusion be not too abundant the clot may be felt through the skin as a hard prominent cord. The œdema gradually disappears on the complete re-establishment of the circulation. Occasionally the cause of localised œdema of the lower limbs is to be sought for at a point higher than the femoral veins,—in the iliac veins or in the inferior vena cava; here again it may be owing to thrombosis, or to compression by the gravid uterus, by tumours, &c.

In many cases, however, localised anasarca cannot be very easily accounted for. I have under my care a robust, florid, otherwise healthy woman, 40 years of age, who for 10 years has suffered from œdema of the legs, reaching as high as the knees, and which during that time has varied but little, if at all; in another case, that of a previously healthy man, an enormous dropsy of the legs and thighs appeared, subsided after a few weeks, and has not since returned. In both cases, notwithstanding repeated and careful examination, no local or general disturbance that the symptom could be traced to was detected; the urine was free of albumen.

Dropsy of one or both *upper* limbs occurs but seldom, and then it is usually produced by compression of the axillary vein (as by enlarged lymphatic glands) or of the subclavian vein. Still more rare is anasarca strictly confined to the upper half of the body; it depends, as a rule, on thrombosis or compression of the vena cava superior, as by intrathoracic tumours or exudations, or aneurism of the aorta.

In the case of a woman 30 years of age, formerly in the enjoyment of good health, I observed dropsy of the upper half of the body, extreme cyanosis, and enormous dilatation of the veins connected with the vena cava superior, all these symptoms being fully developed within three weeks; the lower part of the body remained perfectly normal. Several of the superficial veins of the neck and back appeared to contain only coagulated blood. As no post-mortem examination could be obtained it can only be conjectured that the origin of all these phenomena must have been constriction of the superior vena cava by pressure from without or by thrombosis, as physical examination of the internal organs did not reveal the presence of the slightest morbid change.

A second and rarer abnormality in the subcutaneous tissue is the accumulation of air within its meshes,

SUBCUTANEOUS EMPHYSEMA.

Like dropsy, it gives rise to a certain amount of swelling, but

as this is never so considerable as in that affection, the appearance of the skin is not altered. Emphysematous parts, like those which are anasarcaous, pit on pressure with the finger, but not so deeply, nor does the mark last so long, as the elasticity of the skin is almost unimpaired, emphysema being a condition which is generally very rapidly developed. Its most characteristic feature is *the feeling of crackling or crepitation* communicated to the hand on pressing the inflated parts, which exactly resembles that experienced on pinching a portion of healthy lung between the fingers. Emphysema is very variable in its distribution, occupying sometimes a smaller, at other times a larger, area, and occasionally extending over nearly the whole of the body. After gaining entrance the air may diffuse itself indefinitely in the subcutaneous cellular tissue, as each mesh communicates with those around it on all sides; this may be demonstrated experimentally on animals, in which it is well-known that the inflation of the entire subcutaneous areolar tissue may be effected from any part of the body.

Subcutaneous emphysema is usually caused by internal or external injury of organs which contain air. Rupture of the œsophagus in the neck by perforating ulcers, from necrosis or the swallowing of foreign bodies, may produce it by allowing the air to enter the cellular tissue at that part, whence it may spread to the breast or further; but when the trachea or one of the larger bronchi is at the same time involved in the ulcerative process and so made to communicate with the œsophagus (broncho-œsophageal fistula), emphysema is wanting. When, in cases of perforation of the stomach or bowel, the affected part becomes attached to the abdominal wall, the gas passes from these organs into the cellular tissue if the opening be large enough; where this attachment does not take place the gas is forced into the peritoneal cavity. Perforation of the larynx and trachea from ulcer gives rise to emphysema in the region of the throat, wounds of the costal pleura and surface of the lungs (by stabbing, gunshot, or fractured ribs, and occasionally by the bursting of an abscess of the lung) to subcutaneous emphysema of the chest. In the latter case the air escapes from the ruptured alveoli or smaller bronchi at each inspiration and passes directly through the torn costal pleura to the subcostal areolar tissue when there are inflammatory adhesions between the injured part of the

lung and the chest wall; when no such adhesions exist pneumothorax is first developed, the air being subsequently driven from the pleural sac through the wound in the costal pleura, and so into the cellular tissue.

Emphysema may also be set up by rupture of the air-cells, not from external injury but from over-distension; here the air is forced into the interlobular septa, through the mediastinum, and into the subcutaneous tissue of the neck. It appears first in the fossa jugularis, then in the areolar tissue of the side of the neck, and finally on the surface of the chest. Weakness of the texture of the lung, forcible expansion of the air-cells in severe dyspnoea, violent attacks of coughing, evidently predispose to such tearing of the alveoli, as most of the cases of this variety of emphysema are observed in connection with croup, diphtheritis of the larynx, whooping-cough and bronchitis in children, and advanced pulmonary emphysema in the aged.

Sclerosis of the subcutaneous areolar tissue is a morbid change which is very rarely met with. The extent of surface involved is very variable; thus, of four cases which I have seen, occurring in adults, in one the skin of both lower limbs and of the abdomen was affected, in two that of the arms and face, while in the fourth it appeared in small isolated spots on the forearms and hands. The indurated skin was in all the cases slightly cyanotic, obviously from compression of the smaller cutaneous veins. The pathogenesis of scleroderma is still very obscure. In three cases examined by the author the internal organs were perfectly normal; in a fourth the patient suffered also from Addison's disease, as in another case observed by Rossbach. In a case of almost general scleroderma Heller found small fibroid tumours and largely dilated lymphatic vessels in the areolar tissue under the skin, and obliteration of the thoracic duct; this gives a certain amount of support to the theory that scleroderma depends on some disease of the lymphatic vessels by which the flow of lymph is impeded.