

With regard to internal remedies, I will merely make a few remarks concerning arsenic, atropine, pilocarpine, and a few other alkaloids.

The internal or hypodermic use of arsenic has been highly praised in the treatment of carcinoma of the skin, lupus, psoriasis, and lichen ruber.

There is no doubt that arsenious acid influences the nutrition of the skin, as is shown in arsenic eaters, and in horses to whom arsenic is given in order to make them fatter and the skin more glossy.

A number of alkaloids, particularly ergotine, pilocarpine, and atropine, have been recently used with success in the treatment of angioneuroses and neuroses of the skin.

Finally, a few words concerning the beautifying of the skin.

1. A healthy integument is not necessarily beautiful. Even if all requirements concerning diet, residence, atmospheric and climatic conditions, etc., are carried out, the complexion is often extremely bad. The general condition of health has no influence on the beauty of the complexion, though it has upon the health of the skin.

2. Cleanliness is a *sine qua non* of the beauty of the complexion, though it does not play a great part in the health of the skin.

3. Water is serviceable to the skin only in moderate amounts and at moderate temperatures. Very cold or warm baths, when used to excess, diminish the elasticity of the skin and its power of resistance to external irritants.

4. Distilled and so-called soft water are more suitable for washing and less irritating than hard water.

5. The hard soda soaps are usually preferable to the softer potash soaps for toilet purposes. The quality of soaps depends upon the quality of their constituents and the thoroughness of the saponification. Good soaps must not contain free alkali, or any foreign, irritating substance. The addition of moderate quantities of perfumes does not materially change the quality.

6. Simple, finely ground powders, such as starch, magnesia, etc., are entirely innocuous and often act as a useful protection against external irritants.

7. Frequent application of alcohol abstracts the water of the skin, makes it dry and brittle, and impairs its nutrition. This is also true of glycerin. All toilet washes containing alcohol to any considerable extent should be avoided.

8. This is true to a still greater extent of other additions to washes, such as corrosive sublimate, mineral acids, certain metallic salts, etc.

9. Camphor acts merely as a bleaching powder. This is also true of benzoic resin, sulphur flowers, and substances containing tannic acid.

10. The use of sweet smelling oils and fats should be employed to a greater extent than is now done for toilet purposes.

11. This is particularly true with regard to the growth of the hair. The nutrition of the scalp should be increased by the rational application of fat (for example, in the form of oil-baths by means of the application, at night, of a sponge soaked in oil upon the scalp), and the greater use of simple pomades; this should be applied to the roots of the hair, rather than the shafts.

12. Substances should be avoided or sparingly used which abstract water from the skin and the roots of the hair.

## HYPERÆMIÆ, ANÆMIÆ, AND HEMORRHAGES OF THE SKIN

BY

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### HYPERÆMIÆ.

By *hyperæmia* is meant that transient or continued condition of the entire system or of single parts, in which the blood-vessels present either an excessive accumulation of blood or its actual superabundance. Excess of blood in single parts is only a partial manifestation of general congestion; the former constitutes *hyperæmia* proper, the latter *plethora*. In both cases, an increased blood-pressure may result either from heightened vascular energy or from diminished resistance in the vessels. Increased blood-pressure causes an influx of arterial blood; diminished resistance produces accumulation of venous blood, and hence we distinguish between *arterial hyperæmia* or *hyperæmia from fluxion*, and *venous hyperæmia* or *hyperæmia from engorgement*.

*Cutaneous hyperæmia* is made known by visible alterations in the integument. The congestion extends to the vessels inclosed within the layers of the corium, and in some places to those of the subcutaneous connective tissue. It affects a larger or smaller area, according to the causal conditions, and leads to changes in the color of the skin.

These forms of congestion are also known as active and passive hyperæmia; *active*, when the blood-vessels undergo an enlargement, and their contents are propelled more rapidly; *passive*, when, in consequence of obstacles, the flow is retarded. These terms correspond to the mechanical conditions, though we regard the division of the hyperæmiæ into those from fluxion and those from engorgement as physiologically more correct, for strictly speaking, every congestion constitutes a passive condition, since only enlarged vessels are capable of containing a surplus of blood, while every contraction of arteries or veins produces an active condition, in which a diminished blood-supply always results from a shrinkage of the vascular lumen. Consequently, also, a precise distinction between hyperæmiæ arising from an increase of arterial blood, and those due to an incomplete emptying of congested veins, though warranted by science, is of little practical importance. In the majority of cases, however, the fluxion-hyperæmiæ are distinguished



from those of engorgement by certain signs. Arterial fluxion is accompanied by increased rapidity of circulation, which imparts a ruddier hue to the integument. In venous engorgement, the oxygen of the blood, by reason of retarded circulation, is absorbed in greater quantity, making the blood darker and giving to the skin a deep-red or bluish color. A quickened arterial current will communicate the specific heat of the blood, which probably is considerably increased by friction with the walls of the vessels, to the surrounding tissues, and hence the hyperæmic skin becomes warmer, while, in cases of engorgement, the slowly-flowing and imperfectly oxygenated blood loses its specific heat and causes the tissues to appear cooler.

The *symptoms* of cutaneous hyperæmia correspond at the outset with the indications just given; sometimes the earliest sign is the heightened color of the skin; sometimes this is combined with an elevation of temperature. Through continuous operation of the underlying causes, slight swelling occasionally develops, and there may be an unimportant functional disturbance. The phenomena, therefore, are in part analogous to those occurring in inflammation. Pain is often entirely absent, especially when the disease affects large cutaneous surfaces, and is frequently felt only as a sensation of pricking, burning, etc. All the symptoms mentioned may endure singly or in combination for a longer or shorter time, without giving rise to any important disturbances, although they serve as starting-points for the sequelæ of hyperæmia. To this class belong the exudative and hemorrhagic processes.

*Exudation* takes place when the hyperæmia is essentially increased by increased lateral pressure in the blood-vessels, and since the tension of the vascular walls is sometimes greater than their elasticity, the enlarged vessels, under this pressure, will permit an escape of plasma. This exudation, if the undue pressure be constantly maintained, may further lead to an increased growth of tissue, *i. e.*, to hypertrophy.

The hemorrhagic sequelæ of cutaneous hyperæmia are met with when, through peripheral influence, *i. e.*, without the action of the heart being directly concerned, laceration of the capillaries takes place, with escape of their contents. Hemorrhagic affections of the integument, which are brought about by increase of the central cardiac pressure, together with diminished vascular resistance, as in cases of the hemorrhagic diathesis, of pyæmia, scorbutus, etc., are altogether independent of cutaneous hyperæmia.

We find, therefore, that hyperæmia shows itself either as a merely transient condition or as the preliminary stages of long-lasting diseases, and that the cutaneous alterations clearly proceed either from repeated attacks of the complaint, or as results of its passage into other affections.

The blood-vessels, as is well known, are acted on by the *vaso-motor nerves*, which originate in the gray substance of the spinal cord (Vulpian), but which may be regarded as taking their departure from the sympathetic ganglia. Besides these, individual, isolated vascular nerve-centres exist (Eckhardt, Stricker), which give origin to similar branches of nerves. The innervation of the blood-vessels is a very extended one, their condition being affected not only by the sympathetic, but also by the brain and spinal cord.

Investigations concerning the points of exit of the vaso-motor nerves have chiefly resulted in explaining the *contractility* of the blood-vessels. Through them we know that all variations in the color and temperature of the skin are due solely to the agency of the vascular nerves. Further inquiry has shown that vascular innervation takes place in two directions, since the vaso-motors effect, not only contraction, but also dilatation

of the vessels, the *vaso-constrictors* acting in the former case, and the *vaso-dilators* in the latter.

The activity of the vaso-constrictors is essentially expended in maintaining the blood-vessels in that state of moderate contraction upon which depends their tonus, *i. e.*, that constant excitation in which the vascular apparatus normally exists, and which, by overcoming the slight resistances met with, permits an equable flow of its contents. The vaso-dilators, the function of which consists in enlarging the blood-vessels—an effect which many prefer attributing to paralysis of the constrictors—are opposed to the action of the latter; when the equilibrium between the action of the vaso-constrictors and that of the dilators is disturbed, and the influence of the latter preponderates, hyperæmic conditions and an erythematous discoloration are produced.

#### A. HYPERÆMIÆ FROM FLUXION OR ACTIVE HYPERÆMIÆ.

These are characterized by an increased flow of blood through the cutaneous vessels and more or less redness of the skin. The color varies from pale pink to blood-red, according to the thickness of the cutaneous layers over the affected part. Thus a hyperæmic scrotal integument presents a deeper redness than the sole of the foot when similarly affected, because in the former case a much smaller supply of blood is required by the enlarged vessels than is needed in the latter where the very minute vessels pass through dense and less yielding tissue. These hyperæmiæ may be either diffuse or circumscribed, and present definite clinical types; these may be enumerated as follows:

##### (a) *Erythema.* (b) *Roseola.*

(a) *Erythema, E. hyperæmicum* exhibits a pinkish or deep-red discoloration, distributed uniformly or in spots and momentarily disappearing under pressure. It runs its course as an acute affection and only assumes the chronic type by changing into some allied form associated with disorders of nutrition. The shape and extent of erythema are quite undefined and irregular; it is usual to include under this designation all spotty formations of the kind just described which are larger than a pea.

(b) *Roseola (Rosalia, Rose-rash)* is allied to erythema, and consists of circular spots, varying in size from that of a hemp-seed to that of a lentil, and light or dark red in color. The rash follows the course of an acute affection, turning pale or momentarily disappearing under pressure, and like erythema appears either as a hyperæmic condition or as a long-lasting disorder resulting from consecutive alteration of tissue.

Erythema and roseola are, therefore, two closely related types, solely distinguishable by their different configurations; both, so long as they constitute hyperæmic conditions merely, are to be regarded as *symptoms*, and can only be spoken of as skin diseases inasmuch as they often recur persistently without discoverable cause, and without being developed as the result of direct action on the external integument. This explains why the erythemata have been considered as exhibiting both idiopathic or independent and symptomatic or secondary forms, although such a classification is forbidden by the actual nature of these cutaneous affections. When, however, we speak of the erythemata as symptoms, we are but returning to the views of the older dermatologists (Lorry, Bielt, Bateman) who never thought of dividing these diseases according to the principle laid down by Hebra.

The *duration* of erythema is very variable; it often lasts only a few hours, often again for some days, or even for weeks, in cases where the cutaneous hyperæmia recurs frequently, after its chief symptoms have repeatedly subsided.

The *locality* of erythema is important because the complaint, when a symptom of



certain diseases, often manifests a preference for particular parts of the body. Erythema generally shows itself on the trunk as a precursory symptom of severe febrile disorders (variola, morbilli); it occurs both on the trunk and limbs as an effect of certain drugs (quinine, belladonna, etc.), and on the face and other hairless regions, in consequence of emotional disturbances. Sometimes it displays itself more extensively, attacking almost the entire surface as "erythema universale."

The mode in which it makes its appearance forms another characteristic of erythema. The change of color always comes on quickly, often suddenly, and this peculiarity led the English writers to apply to it the term "rash," a designation which, rendered into scientific language, has been conferred especially upon the erythema of small-pox.

In the delineation here given, under the heads of *color*, *duration*, *locality*, and *mode of appearance*, of changes undergone by the general integument, may be traced a correct picture of *hyperæmic or congestive erythema*, which, as already shown, is characterized by active congestion and caused by disturbed innervation of the vaso-motors (dilatores).

The Vienna school has regarded these erythemas as congestive in their nature and has separated them from the chronic forms which Hebra considered due to exudation. The correctness of this distinction could only be made out from the standpoint of pathological anatomy—a standpoint which, in the light of our present knowledge of the function of the vascular nerves, no longer affords the same evidence. *The development of erythema is only to be completely explained through the action of the vaso-motor nerves.*

In accordance with the mode of classification adopted in the present work, we shall discuss the subject of *congestive erythema* in connection with the hyperæmiæ, instead of treating it as one of the neuroses (angioneuroses). Although our pathogenetic doctrine differs from that of the current manuals, yet this circumstance will in no wise interfere with an adequate presentation of our theme in its clinical aspect; and, our point of view being thus made plain, we proceed at once to describe the various forms under which hyperæmic erythema is encountered.

(a) *Erythema Caloricum*.—The elements that surround us may, by reason of their very high or low temperature, give rise to hyperæmic conditions attended perhaps by swelling of the cutis with more or less copious exudation. Hot or cold baths may produce such forms of erythema which quickly subside when their causes cease to operate. Another variety is *solar erythema*, a simple and brief hyperæmia, only dangerous when associated with insolation. It affects only those parts of the body which are habitually kept uncovered; it is dangerous when occurring in the scalp, as it is then accompanied by cerebral symptoms, resembling an acute and fatal attack of meningitis.

According to medical reports from tropical countries, erythema is often wanting even in the severest and most rapid cases of insolation; on the other hand, inflammatory erythema, erysipelas, etc., not seldom constitute its attendant cutaneous lesions. *Treatment* of erythema caloricum should be purely expectant. Should the symptoms seem disposed to linger, cold ablutions and the application of rice-powder or fresh grease may be of service. When accompanied by insolation with cerebral symptoms, antiphlogistics must be resorted to.

(b) *Erythema ex profluviis* (intertrigo).—The skin may be reddened and even inflamed by long contact with different secretions which are not in themselves injurious, but have been decomposed by exposure to the atmosphere and thus converted into cutaneous irritants, like urine, mucus (especially from the genitals), diarrhœic stools, etc. Women affected with leucorrhœa are very liable to be troubled in this way; likewise little girls who suffer from vaginal discharges, in which cases the symptoms are not to be

attributed to contagion, although they frequently include inflammation and swelling of the labia. Infants, in the earlier months of life, who are not carefully cleansed after evacuations of the bowels and bladder, frequently exhibit this form of erythema. In the case of older children with delicate constitutions, a thin skin of fine texture favors the development of these complaints. Cutaneous irritation and erythema are often produced around profusely suppurating wounds by the action of the discharges. That form of erythema, known as *intertrigo*, which is often called forth in adults by local perspiration, and in children and invalids by neglect of cleanliness, results primarily from constant contact of the irritating substance with too closely-apposed cutaneous surfaces.

Intertrigo frequently persists only a short time as an erythema, changing, if the perspiration which gave rise to it becomes constant and excessive, into an eczema. Atmospheric air being prevented from reaching the affected parts, their originally acid secretion becomes alkaline, and irritates the sensitive integument.

The cutaneous surfaces liable to intertrigo are: those at the angle formed by the ears and scalp; the inguinal region, especially in corpulent adults; the skin beneath the mammary glands in women, or a pendulous abdomen in either sex.

The *treatment* of this variety requires strict cleanliness, diligent washing with pure water, or, if this is not well borne, the application of zinc or lead ointment. Tillaux<sup>1</sup> remarks very correctly that even the use of simple cerate may give rise to inflammatory symptoms. The antiseptic dressings at present in vogue are also capable of exciting erythema. Attention must be paid to these circumstances, if we would understand the inveterate character of such forms of erythema, and their liability to pass into chronic maladies. In many cases, it will suffice to sprinkle the affected surfaces with pulv. amyli, pulv. oryzæ. Fomentations of aqua Goulardi, diluted with equal parts of water, are of great service. These, however, must be used perseveringly until the erythema has gradually but completely disappeared.

(c) *Erythema traumaticum* (Hebra) is that form which is produced by simple mechanical causes whenever the surface is subjected to constant pressure from sitting, lying, the wearing of tight garments, bandages, etc. The hyperæmia will continue so long as the irritation is kept up. If the latter becomes more intense and unintermitting, stasis and exudation will arise, and the hyperæmia from fluxion will be succeeded by a state of engorgement. To the same class belong those cutaneous discolorations which are caused by gravitation of the blood toward dependent parts, especially in severe and protracted complaints which compel confinement to a recumbent posture; the pressure then acts locally as a passive force, since the skin suffers injury wherever the patient's couch comes in contact with projecting points of his anatomy. Such erythemata may result in further disturbances of circulation, with production of bed-sores and gangrene.

Hebra rightly lays emphasis on the fact that those parts most commonly affected by erythema seem also very liable to the attacks of other cutaneous diseases. For instance, in shoemakers and tailors suffering from scabies, the greatest number of pustules and nodules, owing to the sedentary nature of their employment, are situated on the buttocks; in women with small-pox, the eruption is more abundant on the parts where their clothes are fastened, *i. e.*, about the waist and below the patella.

(d) *Erythema from Psychological Causes*.—This constitutes the type of a physiological angioneurosis. The hyperæmiæ due to such influences are denominated *erythema pudoris*, etc.; they include those sudden flushes that arise from joy, terror, and the like.

<sup>1</sup> Bulletin de Thérapeutique, t. 71, p. 273.



It must be supposed that the vascular centres, as a result of these mental impressions, effect, through their nervous connections, a rapid dilatation or contraction of the entire vaso-motor apparatus, which produces an extensive congestion of the cutaneous vessels (hyperæmia). Such conditions are of brief duration.

#### B. HYPERÆMIÆ FROM ENGORGEMENT OR VENOUS HYPERÆMIÆ.

*Congestions arising when any system of vessels becomes opposed to the regular flow of the blood-current by increasing the amount of resistance it has to overcome are called hyperæmiæ from engorgement.*<sup>1</sup> Such a vascular stasis results in a retardation of the blood-current in case no sufficient outlet for the impeded flow is provided by the collateral branches, and hence the fact of retardation is what distinguishes this species of hyperæmia from that produced by fluxion.

The venous hyperæmiæ present spots of *dark-blue, grayish-blue, and even reddish-black*, which turn pale, but do not always completely disappear on pressure. Usually these spots soon fade away, yet they frequently give rise to more profound disturbances with sequelæ in the shape of exudations and hemorrhages. The hyperæmiæ from engorgement do not occur in the same way as the active hyperæmiæ, nevertheless it is not always possible to distinguish precisely between the two conditions.

We therefore classify as venous hyperæmiæ those forms in which, through disturbances in the cutaneous circulation, the venous anastomoses experience an accumulation of blood which becomes outwardly apparent. Such engorgements may result from mechanical or from cosmical influences. Among the former are included the symptoms produced by long-continued pressure or friction; among the latter, those due to the surrounding elements, water and air.

(a) *Venous Hyperæmia from Mechanical Causes.*—Whenever continuous pressure is made upon the skin, whether by a tight bandage or closely-fitting garments, we find in the underlying integument a turgescence of the veins, sometimes with partial œdema. This is observed with especial frequency on the lower extremities, where the force of gravitation exerts no inconsiderable influence over the distribution of the blood. If the reflux of venous blood is persistently impeded, the veins become enlarged, and show through the skin like more or less twisted cords, as in persons who are obliged to stand continually (cooks, bakers, turners, etc.). Individuals of sedentary habits, as clerks, literary men, etc., exhibit a similar telangiectasia of the pelvic organs (hemorrhoids).

Auspitz<sup>2</sup> has investigated very thoroughly the subject of the discoloration which takes place in passive hyperæmia. His numerous experiments resulted in reproducing the various deeper shades, from the cyanotic to cinnabar-red. They proved that these dark hues are owing to the escape of the coloring matter of the blood along with its pressed-out serum. The coloring matter is forced out at the edges of the compressed part, while the centre of the later becomes paler, because at the same time individual blood-vessels filled with serum are prevented from circulating.

In some diseases (typhus, severe pneumonia, fracture, etc.) in which patients scarcely change their positions during long periods, the blood likewise accumulates in the most dependent parts. This is more likely to occur where the skin lies close to the

<sup>1</sup>In cases of impediment to the blood-current, we know that the arteries which pursue a peripheral course are better enabled, through their *collateral* connections, to compensate for all irregularities of resistance than are the veins which run directly to their centre, the heart.

<sup>2</sup>“On Venous Engorgement,” *Vierteljahrsschrift f. Dermatolog.*, 1874.

bones in consequence of loss of fat or muscular atrophy, as over the sacrum and the scapulæ, in which situations bluish-red or dark-blue spots will be presented. These gravitation hyperæmiæ are named hypostases. They constitute another cause of decubitus with subsequent destruction of the soft parts.

(b) *Hyperæmia from Cosmical Influences.*—These include cutaneous discolorations due to the action of cold water or cold air. When the skin is subject to such influences, a contraction of the minute vessels takes place, and prevents here and there the emptying of the capillaries. If the cold continues to operate, but with less energy, signs of engorgement become apparent, and the skin remains cool and blue until the temperature of the medium has become high enough to produce an equilibrium between the internal and external conditions. The next result is an enlargement of the vessels, which enables the retarded blood to pass off more easily, and the skin resumes its normal appearance. If the cold is sufficiently intense, the parts lose their sensibility, and local inflammatory symptoms set in, which may terminate in mortification and sloughing.

(c) *Venous Hyperæmia from Pathological Causes.*—Under this head, we include all states of engorgement from diseased conditions which are characterized by a dark or cyanotic color of the skin. As already remarked, this dark hue is produced by an excess of carbonic acid in the blood, which again is the result of a retarded circulation from pathological obstacles. The more distant the affected part from the heart, and the slower the passage of blood, the deeper is the cyanosis and the larger the extent of surface involved. Sometimes only the tips of the fingers and toes, sometimes also the nose, cheeks, and eyelids exhibit this deep-blue appearance. This variety of hyperæmia forms an essential symptom of *local asphyxia*, the precursor of the so-called *symmetrical gangrene of the extremities*.

These cyanotic alterations of the skin occur most speedily in diseases where, as in croup and œdema of the glottis, the entrance of air is greatly obstructed. When exudation takes place in the respiratory organs, as in pneumonia, pleurisy, and tuberculosis, the same hyperæmic condition is developed much less rapidly. Diseases of the heart sometimes give rise to cyanotic phenomena, though likewise by slow degrees, the retardation of the circulation being manifested by sanguineous engorgement in the great vessels.

Finally, we have to mention a disease that is characterized by a dark-blue color of the entire cutaneous surface—*cardiac cyanosis, morbus cœruleus*. The more common causes of this disorder are patency of the foramen ovale; absence or incomplete closure of the septum ventriculorum; origin of the aorta in the right ventricle; origin of the aorta in the right ventricle, while the pulmonary artery springs from the left ventricle. Occasionally, however, cyanosis does not result, despite the existence of the anatomical anomalies; they are then first brought to light by an autopsy.

It is unquestionable, therefore, that cyanosis is not caused by a mingling of arterial and venous blood, but can only exist when, in addition to the influences just mentioned, a venous stasis takes place into the capillaries. This explains why cardiac cyanosis occurs under precisely the same conditions as all other venous hyperæmiæ.

The *treatment* of hyperæmiæ from engorgement must usually be directed to the removal of the obstacles to circulation. Medical skill is helpless in cases of congenital malformation of the heart; yet *hypertrophy* of the right ventricle, in individual instances, is Nature's own contrivance for the alleviation of cyanosis. Notwithstanding congenital defects in the cardiac structure, cyanosis frequently does not show itself on the skin until the later years of life. Thus Peter Frank relates that he saw a case of



cyanosis in a man which did not come on till he was fifty-seven years of age. I know a girl fifteen years old, of healthy parentage, in whom the symptoms of cyanosis first appeared in her fifth year. The slightest emotional excitement causes the skin of her face to turn deep-blue, while at all other times only the end of the fingers and toes, the tip of the nose, and borders of the lips are discolored. Examination of the heart reveals no valvular defects nor any disturbance of its chief normal relations.

Forster' long ago attempted to improve the condition of the highly carbonized blood in this disease by supplying it with an increased amount of oxygen through the administration of chlorate of potash, and he claims to have effected considerable amelioration in individual cases. He obtained still better results from the prolonged use of *hyperoxide of hydrogen*, 8 drops in cod-liver oil, three times daily.

## ANÆMIÆ OF THE SKIN.

This title includes those disorders of the integument which result from a diminution in the entire volume of the circulating fluid. Strictly speaking, it would be more correct to use the name oligæmia in this connection, since anæmia properly signifies an absolute poverty of the blood, whereas we are here concerned merely with a lessening of its amount, which may be either partial or extensive. Virchow first denominated the former condition *ischæmia*, a term which has undergone the same transformation as anæmia. The latter we shall employ as denoting a decrease in the quantity of blood, since such decrease exerts a special influence on the bodily relations and on the color of the skin.

The lessened quantity of blood may either be the direct result of frequent losses (hemorrhages), or it may occur indirectly as a consequence of insufficient formation of blood. The blood-corpuscles may either be actually reduced in number (oligocythæmia), or they may undergo such a change that the relative number of white corpuscles is considerably increased (leucocythæmia). The immediate result of all these alterations is the insufficient nourishment of the vessels and a morbid change in the tone of the general system, which manifests itself on the *outer integument*. The pale, earthy complexion, the yellowish hue of the skin, the loss of color in those parts, as the lips and cheeks, which, in a state of health, are marked out by their roseate tinge—are all characteristic signs of cutaneous anæmia.

Cutaneous anæmia impairs the nourishment of the tissues and lowers the physiological condition of the skin, and it is easily perceived that a continuous decrease in the elements essential to the normal functional activity must be followed by further deviations from a healthy standard, as well as by various incidental disturbances. Such conditions arising from anæmia lead to decay of the tissues, to partial *atrophy*, and if the supply of blood be entirely cut off, to local death—*necrosis*. Hence it follows that, although anæmia may occasion destruction of tissue, yet, since a negative idea is included in its very definition, it cannot give rise to any series of abnormal phenomena more important than those just mentioned. *Consequently, also, cutaneous anæmia produces no diseases of the skin*; it presents itself only as a symptom of general disturbances of nutrition.

Any deficiency in the quantum of blood required for the maintenance of functional activity lessens the supply of nutritive material to the layers of the cutis, so that the

<sup>1</sup> Dublin Med. Journ., 1863, p. 112.

restoration of their wasted substance is very imperfectly accomplished. The immediate results are a dry and brittle state of the epidermic layers, and if the abnormal influences continue, the detachment of thin transparent lamellæ which can be rubbed into a fine powder or into bran-like particles between the fingers. The surface of the skin affected in this way has a dead, lustreless appearance, and when the hand is passed over it, imparts a sensation like that caused by stroking cloth "against the grain." These alterations occur on all parts of the body, but most conspicuously on the extremities; one such morbid condition, characterized by deposits of thin scales, is called *pityriasis*. Besides *palleness* of the skin, its *reduced temperature* is an essential symptom of anæmia.

The *pallor* always proceeds from deficient injection of the cutaneous capillaries. It is often distinctly marked only on isolated parts, and shows more plainly when the local relations give rise to a partial retention of the blood. Similar ischæmic conditions may originate from diseases of single portions of the vascular walls, since, through mechanical pressure, as from bandaging, a narrowing of their calibre may take place, with paleness of the skin only in particular localities.

*Local pallor* is often witnessed as a result of profound destruction of the general integument, with subsequent cicatricial growth (lupus, scrofulosis, syphilis); the skin becomes pale and bloodless, since the cicatricial changes in the connective tissue produce here and there obliteration of the vessels; the latter, however, more frequently disappear completely, and minute veins become visible on the newly-formed epidermic surfaces—signs of a partial new-formation and restored communication with the surrounding capillary plexuses; the pallor is also frequently influenced by the coloring-matter of the blood. When the latter is deficient, the anæmic skin assumes a yellowish-white appearance; where it is more abundant, a darker shade is produced.

The duration of cutaneous paleness varies greatly. When the anæmia is caused by loss of blood, the pallor is extreme and persistent; when vascular nutrition is imperfect, as in oligocythemia and leucocythemia, the skin is pale, but not as yellow as in the former case; carcinomatous and tuberculous subjects present a waxen hue; and all these different abnormal appearances remain so long as the original disease continues.

Cutaneous pallor is not only to be regarded as a diagnostic indication, it also constitutes an *aid to prognosis*. In this respect, the cutaneous symptoms belonging to the acute exanthemata (scarlatina, measles, and the first stage of variola) are of no small value, and we are frequently admonished of **severe internal complications** by the pallor which attends the progress of these complaints. The same remark applies to other diseases, as typhoid fever and cholera. In all these cases, the supply of blood which should normally be retained by the integument is withdrawn from it for the support of morbid processes in the system at large, and as the condition of the latter deteriorates, the small vessels which nourish the skin collapse, and visible anæmia is the result. Hence, the more decided this collapse, during the course of eruptive or other infectious maladies, the more unfavorable is the prognosis, and in this way the state of the skin alone may serve to measure the intensity of diseased conditions.

The *fall of temperature*, that other constant symptom of cutaneous anæmia, is rendered evident in various ways. As a subjective sensation of cold it is perceived most plainly on the parts furthest from the heart. The ears, the nose, and the ends of the fingers and toes become pale and cold. Anæmic patients frequently complain of chilliness in the skin, and the latter in this case becomes shrunken, owing to contraction of the smooth muscular fibres; in like manner, the cold stage of ague is accompanied by transient cutaneous anæmia. Disturbed innervation from emotions of indignation or of joy, or in consequence of insufficient assimilation, as through hunger or fatigue, pro-



duces not only pallor, but a sensation of coldness in the skin. Sometimes this is accompanied by a diminution of tactile sensibility, which may even amount to positive anæsthesia.

The *treatment* of cutaneous anæmia must always be conducted with reference to causal conditions. If we can succeed in compensating for the loss of blood, or in improving the insufficient hæmatisis, we shall be enabled to remove both the internal symptoms of anæmia and its superficial manifestations. The indications for the management of the general affection belong to the department of special pathology; as to cutaneous anæmia, we will merely observe that the best means of arousing the blood-vessels to renewed activity is by *friction with pure water or alcoholic solutions*. If the blood-supply is impeded through predominance of vascular contraction, moist heat in the form of cataplasms, baths, etc., will prove most effective in relieving the circulation and restoring the natural color and temperature of the skin.

## HEMORRHAGES OF THE SKIN.

The term *hemorrhage* is used, in a general sense to denote any condition of the vessels accompanied by an escape of their contents. In consequence of the well-known firmness and elasticity of the vascular apparatus, hemorrhage is impossible except through some alteration or defect in the structure of the vessels. The bleeding may be either *internal* or *external*. The former class includes hemorrhages of the internal organs and cavities; the latter those proceeding from visible mucous surfaces or from the general integument.

Extravasation into the cutaneous tissue assumes several forms, which have been named as follows:

1. *Petechiæ*, when the effused spots are as large as poppy or hemp seeds or as peas, and of a red or dark-blue or bluish-red color; *stigmata*, when they are the size of a millet or of a lentil.
2. *Vibices*, when they appear in streaks.
3. *Ecchymoses*, when they form blotches varying from the size of a pea to that of the palm of the hand; and
4. *Ecchymomata* (boils), when the hemorrhage at the cutaneous surface gives rise to a tumefaction.

These various effusions into the cutaneous tissue are characterized by the fact that, with the exception of the boil, *they do not rise above the level of the skin; they turn pale, but do not disappear under pressure; and fade away by degrees, the skin resuming its natural appearance.*

The *hemorrhagic papule* and the *hemorrhagic vesicle* are examples of hemorrhage combined with exudation, rather than true extravasations. That variety of hemorrhage must also be mentioned in which pure blood is effused upon the surface, without lesion of the vessels themselves. This peculiar condition, known as *hæmidrosis*, being merely a sanguineous effusion which takes place through the excretory ducts of the sudoriparous glands, belongs to the anomalies of perspiration.

*Condition and Symptoms of Cutaneous Hemorrhage.*—The causes of hemorrhages of the skin are of various kinds, yet these accidents can only take place as results of the following changes within the vascular system:

1. *Through Rupture of the Vessels* (extravasatio per rhexin).—This occurs either

from external violence, or through some internal influence which gives rise to a considerable increase of blood-pressure and an effusion into the integument (suffusion and suggillation).

2. *Through Vascular Degeneration* (extravasatio per diabrosin).—This causal condition operates in cases of internal hemorrhage from atheromatous or other diseases of the vascular system, even more frequently than when it results in cutaneous hemorrhages; moreover, a similar state of the vascular walls is produced by a loss of cutaneous tissue substance due to scrofulous, syphilitic, and other forms of ulcers.

3. *Through Transudation through the Vascular Walls* (extravasatio per diapedesin).—This occurrence was recognized by some of the older authors, who supposed that an actual secretion of blood took place through the vascular walls, but this idea was afterward rejected as unsusceptible of proof.

Stricker<sup>1</sup> was the first to demonstrate the passage of blood-corpuscles through the capillary walls, and his conclusions were soon fully confirmed. The occurrence itself was accurately studied on the nictitating and web-membranes of the frog; it arises from the manner in which the corpuscles of the capillaries sometimes adhere to the walls of the latter, and here and there penetrate their finely porous structure; vascular contractility, likewise, occasionally contributing to the same effect. Such a process, obviously, can take place only in capillaries provided with very delicate adventitia.

Extravasations of the above-named descriptions into the cutaneous tissue give rise to various alterations of color (spots), owing to a deposition within the cutis either of the blood itself or of its individual elements. In the former case, the color of the corpuscles will predominate, and the spots will appear of a light or dark red (purplish) tinge; in the latter, however, and also if a certain length of time has elapsed since the occurrence of the hemorrhage, the discoloration will be produced by pigmentary material which has been separated from the blood. Thus, from the *hæmatin* originate those variously colored crystals—viz., the yellow or ruby-red (*hæmatoidin*), the dark-brown (*hæmin*), and the bright-red (*hæmatocrystallin*)—which impart the familiar hues displayed upon the skin as a consequence of contusions.

## HISTORY.

Werlhof was the first<sup>2</sup> who made cutaneous hemorrhages the subject of a special delineation. Werlhof separated the hemorrhagic spots appearing in the course of typhoid and other dangerous febrile conditions, and called *petechiæ*, *febris petechialis*, from another, non-febrile form of purpura which he denominated *morbus maculosus hemorrhagicus*. Werlhof's classical edifice was almost completed by Wichmann on its diagnostic and therapeutical sides; and in like manner his views were partly accepted, partly modified by many later authorities,<sup>3</sup> until the English dermatogists, Bateman, Willan, and their followers gave them the form which, until quite lately, they have since retained. More recently, Schwediaur<sup>4</sup> substituted for "purpura" the term *veliosis*, which was employed in the same sense by Alibert and Schönlein.

This conception almost universally prevailed, and the distinction between *petechiæ*

<sup>1</sup> Sitzungsbericht d. Kais. Akademie, Bd. 52. Prussak, Sitzungerber., Bd. 56. Hering, *ibid.*, Bd. 57.

<sup>2</sup> Werlhof, *Opera Medica*, Hannoveræ, 1775, and Wichman: "Ideen zur Diagnostic," 1800, I., S. 98.

<sup>3</sup> Gauthier Bellefonds: "Essai sur la maladie tachetée hémorrhagique de Werlhof," Paris, 1811.

<sup>4</sup> Alibert: "Vorlesungen über die Krankheiten der Haut," 1837, II., S. 432.