

epistaxis, which occurs, according to the statistics of Grandidier,\* four times more often than hemorrhage from the gums, which comes next in frequency, then intestinal hæmorrhage, hæmoptysis, hæmaturia, hæmatemesis, etc., as named.

The blood escapes from the smallest capillaries, under very strong pressure, and persists obstinately, in spite of the most powerful means to arrest it, hours, days, and weeks together. The result is an extreme degree of anæmia—the skin pallid, the face drawn, lips retracted, the mucous membrane white and sticky, the pulse small, weak, or not to be felt at the wrist; a soft, systolic murmur at the base, and a venous hum over the great veins; or the action of the heart may be too feeble to be recognized. Consciousness may be lost, and death occur in syncope. Owing to the extreme cerebral anæmia, there may be illusions, hallucinations, or attacks of convulsions, as in animals bled to death (Kussmaul and Tenner†). In the syncope, a hemorrhage which could not be arrested may cease spontaneously. Notwithstanding the enormous losses of blood, its reproduction takes place quickly, and between the seizures the bleeders may present the rosy hue of health. The amount sometimes lost seems almost incredible—in one case (Coates) reaching the enormous loss of three gallons in eleven days. The state of the blood in bleeders varies with the conditions of health and after loss by hæmorrhage—that is, becomes more watery with loss—but otherwise there is no difference in composition as compared with healthy blood, except that the former contains somewhat more red globules and more fibrin than the latter, or is richer than ordinary normal blood. The interstitial bleedings occur chiefly in the skin and subcutaneous connective tissue, and when traumatic are observed in parts subject to injury, as the back, buttocks, trochanters, while the spontaneous are observed mostly on the scalp, the scrotum, and the legs. Very small extravasations are called *petechiæ*; larger ones, *ecchymoses*. The blood undergoes the usual changes of extravasated blood: at first a bluish red, then brownish, with green borders, then yellowish—several weeks being occupied in these transformations. Sometimes considerable accumulations of blood are formed, constituting blood-tumors, and are found about the false ribs, on the back, on the inner face of the thighs, in the popliteal space, and on the lower extremities. They vary in size from a hickory-nut to a goose-egg, and attain even larger proportions, and also vary in firmness according to their position. They are of a bluish-black color, and are surrounded by a rose-colored zone, tender to the touch, and signifying the formation of a limiting membrane. These tumors may undergo the usual preparatory changes and be slowly absorbed, or suppuration may occur, and discharge of pus and

\* Schmidt's "Jahrbücher," vol. cxvii, p. 329, "Bericht über die neuern Beobachtungen und Leistungen ein Gebiete der Hæmophilie seit, 1854."

† Sydenham Society edition.

shreds of tissue take place, with considerable hæmorrhage. The only changes to account for the phenomena of hæmophilia are abnormal disposition and arrangement of the superficial vessels of the body. The superficial vessels are abnormally large, the intima remarkably thin. On the other hand, the lumen of the large arteries (aorta and pulmonary) is found to be narrow. The intima of both classes of vessels is usually in a state of fatty degeneration. There has usually existed an hypertrophy of the left ventricle. These changes in the vascular system, and the condition of vascular fullness and congestion, which marks the healthy state of bleeders, together with the abnormal richness of the blood, serve in a measure to account for the extraordinary clinical history of this disease.

**Complications.**—In the bleeder families neuralgic and rheumatic affections seem common. Toothache and myalgia are said to be frequent. Rheumatic joint and muscular affections also occur.

**Duration and Termination.**—The duration of hæmophilia is the life of the individual. If the bleeder escape the accidents of childhood, there may be no manifestation of the diathesis until after adult life. A young woman died on her marriage-night, from hæmorrhage occasioned by rupture of the hymen. A single hæmorrhage may take life in a few hours, as in the case just narrated, or death may result from several weeks of bleeding. The usual result is death. Such small operations as extraction of teeth, circumcision, leeching, etc., are very apt to cause death, while vaccination is much less dangerous. Of 152 bleeder boys, 133 died before attaining twenty-one years of age.\* The hæmorrhagic disposition may disappear in middle life, but this has happened in nine cases only; and, when it does cease, rheumatic and gouty attacks are experienced.

**Treatment.**—All injuries must be carefully guarded against. Bleeding from any abrasion or puncture should be restrained by pressure, if possible. Every form of astringent vegetable and mineral has been used. Epistaxis, which is the most usual form of hæmorrhage, is best arrested by plugging the nares and the application of ice, and by the administration of ergotin. Bleeding from the gums is more easily handled, in that the styptic preparations of iron, the actual cautery, and compression can be used. In hæmaturia, krameria, infusion of digitalis, ergotin, and gallic acid should be administered. Of the systemic remedies there can be no question as to the superiority of ergot and digitalis, and experience is in harmony with physiological experiment. Cures have apparently followed the use of ergot. The administration should never be subcutaneously, and the dose of the aqueous extract will range from two to five grains, as often as may be necessary. When attacks are impending, a brisk cathartic of Ep-

\* Grandidier, *op. cit.*, p. 333.

som salts should be administered to lower the blood-pressure, and the diet should consist of fruits and vegetables only. Sulphuric acid in dilute solution should be taken as a drink. Full doses of digitalis, the patient maintaining absolute recumbency, should then be administered, and when the hæmorrhage comes on the exhibition of ergotin, etc., should be practiced. This method is the best now known for arresting the attacks of bleeding.

#### SCORBUTUS—SCURVY.

**Definition.**—Scurvy is a disease of nutrition, in which the blood is so far impoverished that transudations occur, and large hæmorrhagic ecchymoses become visible in various places.

**Causes.**—This disease occurs more frequently in men, because their occupations expose them more to its causes, and in the feeble and cachectic, especially those who are debilitated by syphilis and mercurialism, and by marsh-miasm. Scurvy usually happens in bodies of men, as soldiers and sailors, who are under the same evil influences, and hence numbers are attacked nearly simultaneously—the cachectic falling victims before the robust. The chief factor is defective alimentation, not in respect to quantity so much as quality. The continued use of salted meat and fish and the absence of fresh meat and fresh vegetables for a long period from the diet are the great cause, and all other influences are merely adjuncts. When such fresh vegetables as potatoes, cabbage, and onions, are supplied, although the other components of the ration may consist of salted and dried meats, scurvy will not occur. So well is this fact understood now, that some one of these articles always enters into the diet of armies and prisons, and, if not attainable in a perfectly fresh state, are supplied in the form of “desiccated vegetables,” *sauerkraut*, etc. Garrod, and afterward Hammond, attempted to show that the constituent, the absence of which is the cause of scurvy, is potash; and that those vegetables most effective in preventing and curing scurvy are remarkable for the quantity of potash which they contain, and of these the potato stands at the head. Undoubtedly, bad hygienic influences exert an influence in the production of scurvy. Living in houses that are dark, damp, and confined, want of exercise, depression of spirits (defeat), *ennui*, all have more or less effect in depressing the bodily functions, and thus favor the ill effects of an improper diet.

**Pathological Anatomy.**—Cadaveric rigidity is slight; suggillations are extensive on the dependent parts; petechiæ and ecchymoses are found on the body and the extremities; the skin is muddy, inelastic, and scaly. The petechial spots are formed by an extravasation proceeding from the capillary network about the hair-follicles, while the larger ecchymoses come from the vessels of the derma. The indura-

tions of the connective tissue, subcutaneous and deeper, are due to infiltration by coagulated blood. The subsequent changes in the clots are the explanation of the appearance presented by these indurations, and depend on the greater or less amount of red globules, and on the solution of the fibrin, or its organization. The fibrin may become organized to that extent in which muscular atrophy and contractions resulting in deformities must ensue. In a similar manner, an extravasation into the substance of a muscle may lead to atrophy, the muscular elements being supplanted by indurated connective tissue. These atrophic alterations and deformities are results of long-standing changes. Recent extravasations, in scorbutus, under appropriate management, undergo the same regressive changes as a blood-clot in the normal state, though somewhat slower, and nothing is found *post mortem* after the process is completed. The mucous membrane of the mouth is the seat of extensive hæmorrhagic infiltration, and is therefore swollen and spongy; but in old cases the gums may be thickened and indurated, due to the formation of new connective tissue. There is more or less effusion into the serous cavities of a straw-colored or sanguinolent serum; the membranes are injected, or coated with exudations, or stained by spots of hæmorrhagic extravasation. The heart is flabby, soft, pale, and hæmorrhages are found in its muscular substance. The lungs are somewhat œdematous, the posterior and dependent parts the seat of hypostatic alterations, and catarrhal and croupous inflammation products are found at the base and elsewhere. There may be extensive solidification from croupous pneumonia, or hæmorrhagic infarctions. There are numerous ecchymoses in the bronchi. The peritoneum is altered in the same manner as the pleura—the evidences of inflammation existing on the visceral and parietal layers in the form of exudations and extravasations. The intestinal mucous membrane is altered by hæmorrhagic spots and erosions, and sometimes by extensive losses of substance. The liver is not usually affected. The spleen, although often unchanged, is sometimes enlarged and softer than normal, and occasionally there are found hæmorrhagic infarctions. The kidneys may be healthy, but the mucous membrane of the pelves, ureters, and bladder contains erosions and ecchymoses. Important alterations occur in the blood—the number of red globules diminished; the white relatively increased; the iron, potassa, and albumen lessened.

**Symptoms.**—The onset of scurvy is so gradual that the patients do not know when it began. They become a little paler, and fatigue more readily, but after a time there is an appearance of anæmia, and such a degree of weakness that the least effort gives rise to exhaustion, and to a sense of præcordial oppression and weakness and palpitation of the heart. The increasing weakness is accompanied by a sense of soreness and fatigue in the muscles, like that induced by prolonged

hard work, but rest in bed relieves, as exercise increases, these sensations. These muscular pains are especially felt in the back and the calves of the legs, and have a rheumatic character, and are often supposed to be rheumatic. The scorbutic subjects become exceedingly sensitive to cold, and continually seek the fire or put on additional clothing. They are somnolent, apathetic, and indisposed to any effort, mental or physical; are dejected in mind, and wear an expression of sadness. The facies presents an unearthly aspect; the eyes are sunken and surrounded by livid aureola; the lips are thin, retracted, cyanosed; the skin sallow, pallid, dry, scaly, and earthy, and here and there may be found indistinct spots of bronze discoloration. The subcutaneous fat has diminished, the muscles are soft and small, and the body-weight is reduced. Such are the symptoms of the initial or prodromal stage. They indicate anæmia, and are suggestive of scorbutus only because of the surroundings, and the presence of other cases. The duration of this period is from a week to two or three months. This prodromal stage may be wanting, but in the cases observed by the author\* was always present.

The scorbutic stage first manifests itself in the gums, which become of a dark-bluish color on their margins, especially at the incisor teeth, and are swollen, projecting between the teeth, and bleeding with a touch. The gums are also quite painful, so that mastication and the mere contact of sapid substances are distressing; but those portions of the gums without teeth are free from these troubles, and hence the toothless, at the extremes of life, are exempt from scorbutus of the mouth. Again, it sometimes happens that these changes in the gums are entirely absent, and the first manifestation of trouble consists in suggillations and subcutaneous extravasations of blood and intestinal hæmorrhage. On the other hand, there are many instances in every collection of cases, in which the only manifestation has been in the mouth, coupled with anæmia and muscular feebleness. In the severer cases after the prodromal stage, the weakness increases to such an extent that they become unable to retain the upright posture, and will fall into syncope in the attempt to assume this position. The action of the heart becomes very feeble, and any exertion brings on severe palpitation, with a sense of extreme præcordial oppression. Fever now comes on, in many cases not as a necessary element in the disease, but a symptomatic expression of a local inflammation of a serous membrane or other inflammatory trouble. The characteristic *bruit* of anæmia is audible at the base of the heart and along the great vessels.

In the further progress of the case the gums become much swollen,

\* The author saw some cases of scurvy when serving in the regular army as medical officer in 1857, during the winter spent in Utah, the command being on half rations, without any fresh vegetables. The description above is, in the main, based on these observations.

rise up to a level with the teeth, are horribly painful, and undergo ultimately an "ichorous disintegration," or diphtheritic sloughs form; in either case, fetid, decomposing sloughs are cast off, leaving the teeth bare or loose. Serious deformities are necessarily produced by these losses of substance when cicatrization occurs. Extensive hæmorrhagic extravasations take place in the skin, chiefly of the lower extremities and body, but rarely on the head or face. There may be purpuric petechiæ, the size of a hemp-seed, or vesicular or papular efflorescences, or large hæmorrhagic spots of irregular size, or vesicles of large size filled with a bloody serum. The least injury or contusion is followed by a suggillation. The skin, too, may become the seat of extensive ulcerations, gangrenous sloughs and hæmorrhage. The subcutaneous tissue may either suddenly or gradually become affected by indurations often of great extent. They are at first red, and tender, but presently become brownish, and the epidermis peels off, leaving a discoloration; or, in severer cases, an acute inflammation is set up, the skin gives way, and a great quantity of blood with shreds of tissue, often gangreneous, is discharged, leaving a more or less extensive foul ulcer. The muscles undergo similar changes—are occupied by indurations, the result of extravasation of blood into their substance, and either acutely inflame, there being great local tenderness and heat, and symptomatic fever, or the process goes on more slowly without fever. Hæmorrhages take place from various mucous surfaces: epistaxis; hæmatemesis; intestinal hæmorrhage; hæmaturia. Fortunately, hæmorrhage from the broncho-pulmonary mucous membrane is not common, except in cases of incipient phthisis. Hæmorrhages take place also on the serous surfaces, and hæmorrhagic effusions, the result of inflammation, are not infrequent in the pleura, pericardium, and peritoneum. Enlargement of the spleen, often to a considerable extent, occurs in a portion of the cases. Albuminuria is present in the severer cases very often, and the urine is otherwise changed in character and composition. The most notable change besides the albuminuria, is the diminution, not only in the amount of urine secreted, but in the relative amount of its solids.

Complications.—The periosteum, cartilages, and joints are affected in the worst cases. Extravasations take place under the periosteum, causing a painful swelling, which may take on an inflammatory character if the extravasation be large. The epiphyses of the long bones become swollen, soften somewhat, and may be detached even. Hæmorrhagic effusions occur in the articulations, causing painful swelling, inflammation, and fever. Meningeal hæmorrhage is a very rare accident, but hæmorrhage into the substance of the brain never occurs. Extravasations of blood also take place in the anterior chamber of the eye and under the conjunctiva. Severe inflammation may be the result. Hemeralopia, or night-blindness, has long been associated with

scurvy, but cases of scurvy are without it, and it often exists quite apart from scurvy. The profound alteration in the fluids and solids of the body caused by scorbutus invites attacks of other maladies. A frequent complication is croupous pneumonia, and a cause of death in many cases. Hæmorrhagic infarctions, usually several, sometimes are also found in the lungs. Ulcerative endocarditis and hæmorrhagic pericarditis are complications which quickly cause a fatal result.

**Diagnosis.**—Until the characteristic change has occurred in the gums, on the skin, etc., the anæmia of scorbutus is not distinguishable from other diseases characterized by this state. When, however, the gums swell, and there are petechiæ on the skin, and indurations beneath, it is impossible to confound it with any other malady.

**Course, Duration, and Termination.**—The usual course of scorbutus consists in the prodromal period, the fully developed attack characterized by the swollen and sloughing gums, the hæmorrhagic affections of the skin, the extravasations into the subcutaneous areolar tissue and muscles, the inflammatory hæmorrhagic exudations of the serous membranes, the profound cachexia, and the period of restoration. The duration is usually protracted, and is influenced by the hygienic surroundings. When the disease is fully developed, the continuance of the causes will keep it in action and increase the morbid process, while recovery, even in an apparently hopeless condition, takes place promptly when the proper aliment is supplied. The earlier the appropriate means of cure are applied, the more perfect the restoration. Serious deformities may result from the inflammations of the muscles, bones and joints, and death quickly follows the lighting up of pleuritis, endocarditis, peritonitis, etc. These evil results only occur when the disease has been unusually protracted and severe. Death usually results from hæmorrhages, from exhaustion, from a serous inflammation, or from pneumonia, but the mortality depends almost wholly on the failure of the necessary supplies, and not on the virulence of the disease. With the progress of knowledge, scorbutus is becoming much less common. No longer are witnessed the frightful cases in armies, on shipboard, and in prisons, such as were very common only a century ago.

**Treatment.**—The prophylaxis as well as treatment of scurvy, above all things, necessitates the use of anti-scorbutic food, fresh vegetables of all kinds, especially the potato and sauerkraut, and lime-juice. In the English navy, lime-juice is most depended on; but ships and bodies of troops are also supplied with "desiccated vegetables," the ordinary vegetables, including cabbage, onions, potatoes, etc., compressed into tablets and carefully dried. Desiccated or condensed milk is also utilized for the same purpose. Whenever attainable, fresh meats are extremely serviceable, and, in their absence, canned meats, beef-juice, and similar preparations, can be made to

supply their place. Yeast has been found by Neumann\* to be highly beneficial, and also the barm of beer. Medicines play a secondary part in the treatment of scurvy. In accordance with Garrod's and Hammond's potassa theory, we may prescribe cream-of-tartar lemonade, to be drunk freely. Quinine and sulphuric acid, either alone or in combination, are used to diminish transudations and to improve the tone of the system in general. Tincture of the chloride of iron and ergot are given to arrest hæmorrhage. There can be no doubt, if the author can depend on his own observation, of the value of whisky as a remedy for the scorbutic state, and to lessen or prevent the extravasations of blood. An ounce of whisky every four hours is generally the most useful amount. Turpentine is a highly efficient stimulant and hæmostatic under the same conditions, and is the best dressing for the ulcers in the skin. Alum, tannin, subsulphate of iron, and chloride of iron, are the most useful local styptic applications for arresting epistaxis, and hæmorrhage from superficial wounds, or ulcers of the skin. Ergotin can, at the same time, be administered by the stomach. Red cinchona-bark in powder is an excellent dressing for the ulcers of the skin. As the various manifestations and localizations of the disease are due to the cachexia, no time should be wasted in treating them, but every effort put forth to improve the condition of the body in general.

#### PURPURA—PURPURA HÆMORRHAGICA—MORBUS MACULOSUS.

**Definition.**—The term *purpura* means a bluish-red or purplish discoloration, produced by extravasation of blood; *purpura simplex* is applied to the simplest form of this malady, in which there are only minute extravasations in the skin (petechiæ), and no hæmorrhages into other parts; *purpura hæmorrhagica* indicates a condition of things in which not only petechiæ appear in the skin, but ecchymoses, vibices, and hæmorrhages occur. Besides the variations in intensity as expressed in the names applied to the disease, there are differences in character. Although a very large proportion of cases of purpura, whether simple or hæmorrhagic, are entirely free from fever, there are cases of both forms in which fever is present—the febrile form (*purpura febrilis*). There are other cases, complicated with rheumatism, one or several joints being affected—rheumatic purpura (*purpura rheumatica*).

**Causes and Symptoms.**—Purpura is not limited by climate, race, sex, or social condition, but it occurs more frequently in females, and is more common from fifteen to twenty than at any other age. It appears to be strictly sporadic. Convalescents from fever seem to be

\* Immermann, *op. cit.*

specially liable to it. The disease usually begins abruptly, the first manifestation being epistaxis. In a few cases there is a prodromal period, of a few days, possibly a week, in which there are some languor and inaptitude for exertion of any kind, sometimes with feverishness, sometimes with rheumatic pains, and slight swelling of the joints, usually the ankles and knees. The next symptom is the occurrence of petechiæ on the lower extremities and body, less on the arms, and rarely on the face. These petechiæ or bluish-red spots, vary in size from a pin's-head to a pea, and change in color successively from bluish-red to greenish, brown, and yellow. As successive crops come out, the appearance of the skin is peculiar, the different colors of different ages being curiously intermingled. Slight injuries, blows and contusions, are followed by extravasations, bluish-red spots of irregular size making their appearance. So long as the disease is limited to these manifestations, it is entitled purpura simplex; but hæmorrhage from the mucous surfaces is very common. The mucous membrane of the mouth is a not unusual source of hæmorrhage, but the spongy and sloughing gums of scurvy are entirely wanting, as also the diphtheritic and inflammatory exudations. Hæmorrhages may also occur in the subcutaneous areolar tissue, in the serous cavities, from the cerebral meninges, but these are exceptional; whereas the hæmorrhages from the mucous surfaces is the special feature, and may be the only condition present. It has been observed a few times that the hæmorrhages have come on suddenly, without any other symptoms, in apparently healthy and vigorous subjects, and without impairing the general health; usually, however, the repeated losses of blood cause an extreme degree of anæmia, manifested by pallor, emaciation, weakness and breathlessness on slight exertion, faintness on assuming the erect posture, swollen ankles, etc. Before hæmorrhages occur, the condition of the blood seems normal; but in the further progress of the cases the blood becomes watery, the white corpuscles increase in number relatively, and the red corpuscles decrease, but the coagulability of the blood is at no period lost. Besides the presence of blood on the mucous surfaces and on some of the serous membranes, there are *post-mortem* changes to be noted. The hæmorrhages are mere extravasations, and under no circumstances inflammatory. The disease may therefore be regarded as a "*transitory hæmorrhagic diathesis*" (Immermann). An important result of the disease, due directly to the hæmorrhages, but persisting after they have ceased, is anæmia. It is in a high degree probable that the anæmia, which is increased by the hæmorrhage, is also a principal factor in their causation. Urticaria is another complication, and seems to be associated with stomach derangement. A much more rare accident is the occurrence of sloughing and perforation of the intestines, produced by hæmorrhagic extravasations into the tunics of the bowel.

**Course, Duration, and Termination.**—The whole course of the disease includes the prodromal period, the purpura simplex, the period of hæmorrhage, and the subsequent anæmia. The duration is influenced materially by the number and amount of the hæmorrhages. An ordinary case will last two or three weeks, but when there are repeated hæmorrhages the disease may continue for several months. Although most cases recover, death sometimes happens from exhaustion, from internal hæmorrhage, from some intercurrent malady, and from perforation of the bowel.

**Diagnosis.**—Purpura may be confounded with scorbutus, hæmophilia, progressive pernicious anæmia, leucocythemia, and cerebro-spinal meningitis. From scurvy it is differentiated by the absence of changes in the gums, of the indurations of the subcutaneous areolar tissue and of the muscles, of the hæmorrhagic inflammation of the serous membranes, etc. From hæmophilia the distinction is made by reference to the history, especially the heredity, by the period of life, by the bleeding from trivial wounds, so characteristic of hæmophilia, and not of purpura. The distinction of purpura from progressive pernicious anæmia rests on the fact that in the former the anæmia is produced by the bleeding, in the latter the bleeding comes on afterward and is due to the poverty of blood. From leucocythemia the distinction is made by the enlarged spleen and enlarged lymphatics, with the growth of which a marked degree of anæmia is coincident, and to which the hæmorrhagic tendency succeeds. The initial symptoms of cerebro-spinal meningitis may be almost identical with those of purpura: purplish spots, pains in the joints, with some slight feverishness, but in a day or two the occurrence of nervous phenomena decides the question.

**Prognosis.**—Most of the cases terminate in recovery. A guarded opinion must be expressed when the hæmorrhages recur again and again, and when the disease occurs in broken-down subjects.

**Treatment.**—The usual treatment consists in the administration of the mineral acids, especially the sulphuric, and of the preparations of iron, especially the tincture of the chloride. With these remedies must be conjoined a suitable dietary, fresh air, sunshine, and moderate exercise. If constipation be present, the most appropriate laxative is sulphate of magnesia with dilute sulphuric acid. If hæmorrhages that are threatening come on with a strong pulse, flushed face, headache, and excitement, digitalis, quinia, and ergotin are the appropriate medicaments. If there be weakness and debility, quinine and alcoholic stimulants moderately should be prescribed. The local means for arresting bleeding consist in subsulphate of iron, tannin, alcohol, ice, or it may be hot water, which is sometimes more effective than cold. For the after-anæmia iron should be pushed.