patient may die in convulsions. Mental symptoms are common, manifested sometimes in a preliminary delirium, but more commonly, in the chronic poisoning, as melancholia or dementia. Posterior spinal sclerosis occurs in chronic ergotism. In the interesting group of 29 cases studied by Tuczek and Siemens, nine died at various periods after the infection, and four post-mortems showed degeneration of the posterior columns. A condition similar to tabes dorsalis is gradually produced by this slow degeneration in the spinal cord.

(2) **Lathyrism** (*Lupinosis*).—An affection produced by the use of meal from varieties of vetches, chiefly the *Lathyrus sativus* and *L. cicera.* The grain is popularly known as the chick-pea. The grains are usually powdered and mixed with the meal from other cereals in the preparation of bread. As early as the seventeenth century it was noticed that the use of flour with which the seeds of the *Lathyrus* were mixed caused stiffness of the legs. The subject did not, however, attract much attention until the studies of James Irving, in India, who between 1859 and 1868 published several important communications, describing a form of spastic paraplegia affecting large numbers of the inhabitants in certain regions of India and due to the use of meal made from the *Lathyrus* seeds. It also produces a spastic paraplegia in animals. The Italian observers describe a similar form of paraplegia, and it has been observed in Algiers by the French physicians. The condition is that of a spastic paralysis, involving chiefly the legs, which may proceed to complete paraplegia. The arms are rarely, if ever, affected. It is evidently a slow sclerosis induced under the influence of this toxic agent. The precise anatomical condition, so far as I can ascertain, has not yet been determined.

(3) **Pellagra.**—This is a nutritional disturbance due to the use of altered maize. The disease occurs extensively in parts of Italy, in the south of France, and in Spain. It has not been observed in this country. It prevails extensively among the poorer classes, particularly in the country districts, and appears to be associated in some way with the use of maize which (according to most authorities) is fermented or diseased. In the early stage the symptoms are indefinite, characterized by debility, pains in the spine, insomnia, digestive disturbances, more rarely diarrhœa. The first clear manifestation of the disease is the pellagral erythema, which almost invariably appears in the spring. This is followed by desiccation and exfoliation of the epidermis, which becomes very rough and dry, and occasionally crusts form, beneath which there is suppuration. With these cutaneous manifestations there are digestive troubles—salivation, dyspepsia, and diarrhœa—which may be of a dysenteric nature. After lasting for a few months improvement occurs in the milder cases and convalescence is gradually established. In the more severe and chronic forms there are pronounced nervous symptoms—headache, backache, spasms, and finally paralysis and mental disturbance. The paralytic condition affects the legs and leads gradually to paraplegia. The mental manifestations, which

are rarely met with until the third or fourth attack, are melancholia or suicidal mania. Finally, there may be a condition of the most pronounced cachexia.

The anatomical changes are indefinite. Chronic degenerative changes have been found, particularly fatty degeneration and a peculiar pigmentation in the viscera. The measures to be employed are change in diet, removal from the infected district, and, as a prophylaxis, proper preservation of the maize.*

VII. SUNSTROKE

(*Heat Exhaustion; Insolation; Thermic Fever; Heat-stroke; Coup de Soleil*).

Definition.—A condition produced by exposure to excessive heat.

It is one of the oldest of recognized diseases; two instances are mentioned in the Bible. It was long confounded with apoplexy. The Anglo-Indian surgeons gave admirable descriptions of it. In this country the most important contributions have come from the New York Hospital and the Pennsylvania Hospital; from the former, the studies of Swift and Darrach, from the latter, the papers of Gerhard, George B. Wood, the elder Pepper, and Levick. In New Orleans, Bennett Dowler studied the disease and recognized the difference between heat exhaustion and sunstroke. Very little has been added to our knowledge of the disease since the publication of a monograph by H. C. Wood. Two forms are recognized, heat exhaustion and heat-stroke.

Heat Exhaustion.—Prolonged exposure to high temperatures, particularly when combined with physical exertion, is liable to be followed by extreme prostration, collapse, restlessness, and in severe cases by delirium. The surface is usually cool, the pulse small and rapid, and the temperature may be subnormal—as low as 95° or 96°. The individual need not necessarily be exposed to the direct rays of the sun, but the condition may come on when working in close, confined rooms during midsummer. It may also follow exposure to great artificial heat; thus the stokers in the Atlantic steamships sometimes succumb to the effect of the great heat in the engine rooms.

Sunstroke or Thermic Fever.—The cases are chiefly found in persons who, while working very hard, are exposed to the sun. Soldiers on the march with their heavy accoutrements are particularly liable to attack. In the larger cities of this country the cases are almost exclusively confined to workmen who are much exposed and, at the same time, have been drinking beer and whisky.

Morbid Anatomy and Pathology.—*Rigor mortis* occurs early. Putrefactive changes develop with great rapidity. The venous engorge-

* The most elaborate discussion of the subject is by Jules Arnould in the Dictionnaire Encyclopédique des Sciences Médicales, tome xxii, 1886.

ment is extreme, particularly in the cerebrum. The left ventricle is contracted (Wood), and the right chamber dilated. The blood is usually fluid; the lungs are intensely congested. Parenchymatous changes occur in the liver and kidneys.

According to Wood, "heat exhaustion with lowered temperature represents a sudden vaso-motor palsy, i. e., a condition in which the existing effect of the heat paralyzes the centre in the medulla." On the other hand, thermic fever is held to be due to paralysis under the influence of the extreme external heat of the centre in the medulla which regulates the disposition of the bodily heat. Owing to this disturbance, more heat is produced and less given off than normally.

Symptoms.—The patient may be struck down and die within an hour with symptoms of heart failure, dyspnœa, and coma. This form, sometimes known as the asphyxial, occurs chiefly in soldiers and is graphically described by Parkes. Death indeed may be almost instantaneous, the victims falling as if struck upon the head. The usual form in this latitude comes on during exposure, with pain in the head, dizziness, a feeling of oppression, and sometimes nausea and vomiting. Visual disturbances are common, and a patient may have colored vision. Diarrhœa or frequent micturition may supervene. Insensibility follows, which may be transient or which deepens into a profound coma. The patients are usually admitted to hospital in an unconscious state, with the face flushed, the skin pungent, the pulse rapid and full, and the temperature ranging from 107° to 110°, or even higher. F. A. Packard states that of the 31 cases admitted to the Pennsylvania Hospital in the summer of 1887, in a majority of them the temperature was between 110° and 111°. In one case the temperature was 112°. The breathing is labored and deep, sometimes stertorous. Usually there is complete relaxation of the muscles, but twitchings, jactitation, or very rarely convulsions may occur. The pupils may at first be dilated, but by the time the cases are admitted to hospital they are (in a majority) extremely contracted. Petechiæ may be present upon the skin. In the fatal cases the coma deepens, the cardiac pulsations become more rapid and feeble, the breathing becomes hurried and shallow and of the Cheyne-Stokes type. The fatal termination may occur within twenty-four or thirty-six hours. Favorable indications are the recovery of consciousness and a fall in the fever. The recovery in these cases may be complete. In other instances there are remarkable after-effects, the most constant of which is a permanent inability to bear high temperatures. Such patients become very uneasy when the thermometer reaches 80° F. in the shade. An extraordinary instance came under my notice in which the patient was subsequently so sensitive to temperatures in the neighborhood of 75° F. that at such times he lived comfortably only in the cellar, and finally sought refuge in Alaska. Loss of the power of mental concentration and failure of memory are more constant and very troublesome sequelæ. Such patients are always worse

in the hot weather. Occasionally convulsions and marked mental disturbance may develop. H. C. Wood states that in a case of this kind chronic meningitis was found.

Guitéras has called attention to a form of fever occurring in the South, known in Florida as "Florida fever," in the Carolinas as "country fever," and in tropical countries as *fièvre inflammatoire* The cases last for a variable time, and are mistaken for malaria or typhoid; but he believes them to be entirely distinct and due to a prolonged action of the high temperatures. He has called the condition a "continued thermic fever."

The diagnosis of heat exhaustion from thermic fever is readily made, as the difference between the two conditions is striking. "In solar exhaustion the skin is moist, pale, and cool; the breathing is easy though hurried; the pulse is small and soft; the vital forces fall into a temporary collapse; the senses remain entire" (Dowler); whereas in sunstroke or heat apoplexy there is usually unconsciousness and pyrexia.

The mode of onset, together with the circumstances under which it occurs and the high temperature, permits thermic fever to be readily differentiated from apoplexy, and coma from other conditions.

Treatment.—In heat exhaustion stimulants should be given freely, and if the temperature is below normal the hot bath should be used Ammonia may be given if necessary. In thermic fever the indications are to reduce the temperature as rapidly as possible. This may be done by placing the patient in a bath at 70°. Rubbing the body with ice was practised at the New York Hospital by Darrach in 1857, and is an excellent procedure to lower the temperature rapidly. Ice-water enemata may also be employed. At the Pennsylvania Hospital in the summer of 1887 the ice-pack was used with great advantage. Of 31 cases only 12 died, a result probably as satisfactory as can be obtained, considering that many of the patients are almost moribund when brought to hospital. It should be compared with Swift's statistics, in which of 150 cases 78 died. In the cases in which the symptoms are those of intense asphyxia, and in which death may take place in a few minutes, free bleeding should be practised, a procedure which saved Weir Mitchell when a young man. Of other remedies, the antipyretics have been employed, and may be given when there is any special objection to hydrotherapy, for which, however, they cannot be substituted.

VIII. OBESITY.

Corpulence, an excessive development of the bodily fat, is a condition for which the physician is frequently consulted, and for which much may be done by a judicious arrangement of the diet. The tendency to polysarcia or obesity is often hereditary, and is particularly apt to be manifest after the middle period of life. It may, however, be seen early, and in this country it is not very uncommon in young girls and young boys.