been a decided decrease in the prevalence of the disease, owing to its infective nature being better understood with consequent improved sanitation and hygiene.

The Bacillus.—This appears as a short fine rod, often slightly curved, with the length of one-half the diameter of a red blood corpuscle. Sometimes shows simple branches. Often presents a beaded appearance due to spores present or irregular staining. The bacillus from bone or scrofulous tuberculosis is less virulent than that from other sources. They are more numerous in the active than in the more chronic processes. Microscopic examination of sections from old chronic lesions may be negative and culture or inoculation may be necessary to demonstrate their presence.

Modes of Infection.—*Inhalation.*—The lungs and respiratory tract are in a great majority of cases the primary seat of the tuberculous lesions. Tuberculous patients with advanced pulmonary changes expectorate countless millions of bacilli daily. When the expectoration is allowed to dry the virulent sputum in the form of dust is scattered far and wide. "The consumptive in himself is almost harmless and only becomes dangerous through bad habits" (Cornet). Infection by inhalation thus becomes the most frequent source of tuberculosis. The closer the contact with the patient the greater the danger, *i. e.*, in case of husband and wife, in families, in prisons, cloisters, barracks and hospitals. Nurses and attendants in hospitals for tuberculosis are not necessarily in as great danger as others owing to the better sanitation therein. The less the attention paid to prophylaxis, ventilation and hygiene the greater the danger of infection. *The expired air* of the consumptive is not

infective but the moist *coughed* breath may be. Danger lies in handkerchiefs, beard, dusting, kissing, spitting, etc.

Milk and Meat.—Milk from tuberculous cows may contain the virus and thus communicate the disease to those who drink it. This danger is real and serious. The frequency of intestinal and mesenteric tuberculosis in children is thus explained. *Butter* may also convey it. The danger from eating tuberculous meat is rather remote though possible, the thorough cooking usually given, however, destroys the bacilli.

Inoculation.—Tuberculosis in man is rarely the result of inoculation and when so the resulting lesions are local. It sometimes occurs in those whose occupation leads to to the handling of dead bodies, dissecting room attendants, undertakers, butchers, tanners, or demonstrators of anatomy. Other sources of inoculation are circumcision, washing the clothes of tuberculous subjects, cuts from broken spit cups, the bite of tuberculous patients.

Hereditary transmission through a diseased mother, via blood through the placenta to the child. The great frequency of it in infancy and childhood and the localization of the lesions bears out this belief. Owing to the greater resistance of childhood the disease remains latent until the power of resistance is lowered by some other cause. Lymph glands, bones and joints are the usual site of the hereditary form. The pulmonary form is less common in infants and children. The possibility of infection in early life from tuberculous parents explains many cases supposed to be hereditary.

Conditions Favorable to Development. *Environment.*—Impure air, darkness, dampness, poor food, damp

and poorly drained soil. *Individual Predisposition.*—Delicate constitutions, scrofulous diathesis, and in certain families the "tendency."

Age. None are exempt. It is most prone to attack those from eighteen to thirty-five years. *Sex.* Shows little influence, though females are slightly more prone to the disease owing to their sedentary, indoor life. *Race.* Negroes and Irish are the most susceptible. Hebrews are relatively immune. *Occupation.* Whatever causes crowding together in a dust laden atmosphere, as in mills, factories, or mines, predisposes. Glass and stone workers are especially liable. *Local Conditions.* Neglected catarrhs of the respiratory tract favor lower resistance, as do also the infectious diseases, measles, pertussis, etc., and chronic diseases of the heart, kidneys or liver. *Trauma.*—Injury may be an exciting cause—to the chest to the pulmonary, to the knee to the arthritic, to the head to the meningeal forms respectively.

Evolution of the Tubercle.—The bacilli enter a given tissue or organs *via* of the blood, air or lymph current. They rapidly multiply and disseminate into the surrounding tissues with consequent irritation and the proliferation of connective tissue cells and the formation of epitheliod and giant cells with great increase of the leucocytes. The little induration thus formed constitutes the "tubercle." It degenerates in two ways: first, by Caseation. In the center the cells soften, lose their outline and the tubercle becomes a cheesy, homogeneous mass alive with bacilli. Second, by Sclerosis. After undergoing caseous degeneration, fibrous elements appear and multiply, usurping the place of the caseous

matter until the tubercle becomes a dense hard nodular structure.

Diffuse Inflammatory Tubercle exists in the form of a diffuse, cheesy infiltration affecting various organs, such as the lungs, kidneys, liver, meninges, testes, spleen, etc. It is merely a "tubercle" on a large scale, the result of coalescence of many foci of inflammation with breaking down of the inter-cellular walls. It is rich in cell products and inflammatory exudate. If in the lungs the air vesicles of the involved area break down and become filled with these various products. The result is a caseous extensive tuberculous mass. In the lungs any sized area from a small lobule to a whole lung may thus be involved. Suppuration in tuberculous lesions is the result of a mixed infection by pus-organisms.

Miliary Tuberculosis. Acute General Tuberculosis.—So-called from "milium," the millet. Is an acute general tuberculosis, running a rapid course and characterized by the diffuse distribution of miliary tubercles in the various tissues and organs of the body. It is due to an auto-infection by the tubercular bacilli, caused by the presence somewhere in the body of a caseous focus, sometimes unsuspected but often ascertainable; which ruptures into a vein or lymph vessel, more particularly the thoracic duct or the pulmonary veins. The bacilli are thus conveyed to the various tissues and a systemic infection running a rapid and malignant course ensues. The tissues most seriously affected are the lungs, pleuræ, peritoneum, cerebral meninges, lymph glands, spleen, liver and kidneys. The bacilli are unequally distributed to these different organs, hence the

symptoms vary greatly according to which organ is most involved. Three forms are most distinctly recognized.

The General or Typhoid form in which the symptoms are those of a general infection resembling typhoid fever. The Pulmonary form in which the case strongly resembles a catarrhal pneumonia and the Meningeal variety or tubercular meningitis.

Added to these forms of tuberculosis we have the infection of the lymphatic glands of a chronic type commonly known as "scrofula."

PULMONARY TUBERCULOSIS.

Pulmonary phthisis, pulmonary consumption. Phthisis, from the Greek, meaning "to waste," popularly known as "consumption."

Tuberculosis of the lungs is the most frequent, fatal and interesting of the various forms of tuberculosis. It here presents a great variety of lesions; some characteristic, some of mixed quality, some belonging in common to other diseases, but *all marked by the presence* of the *bacillus tuberculosis*.

There are three forms of pulmonary tuberculosis. 1st. Acute pneumonic phthisis. 2d. Chronic phthisis. 3d. Fibroid phthisis.

ACUTE PNEUMONIC PHTHISIS.

Definition.—"Phthisis Florida," "Galloping Consumption." Is an acute pneumonic tuberculosis running a rapid course and presenting symptoms that in some

cases resemble croupous pneumonia, in others broncho-pneumonia.

Symptoms.—The patient is seized with symptoms resembling pneumonia, chill or chilliness, fever, chest soreness or pains, cough, with expectoration, pulse rapid, respirations increased, areas of diminished resonance are discovered with dullness and bronchial breathing. In the *bronchial* form with various rales and scattered lobular consolidation; this is usual in children, especially after measles, and whooping cough. Or in the *croupous* form there may be rusty expectoration and consolidation of an entire lobe.

The patient may die in a few days from the intensity of the pneumonic process; may linger some weeks and die of exhaustion from hectic fever and general septic condition due to the local process, or at the end of four to six weeks may survive and apparently rally from the acute condition only to pass into a state of chronic phthisis.

Diagnosis.—Is very difficult at first; these cases so closely resembling pneumonia, and often go on to the time when a pneumonia would be expected to terminate without their tuberculous nature being suspected A case of pneumonia ushered in or accompanied by hæmoptysis is very suspicious. If by the twelfth or fourteenth day in a case of supposed pneumonia resolution or improvement does not take place, but, instead, the fever shows wide variations between the morning and evening records, there are periods of chilliness, with sweats evening or at night, the pulse is rapid and weak, the patient is much exhausted, anæmic, with no returning appetite, there is rapid emaciation, night cough; the

expectoration muco-purulent and greenish in color, evidences of softening in spots previously dull, with many moist rales. All this should excite alarm and an examination of the sputum be made. If this reveals the presence of the tubercle bacilli the diagnosis of pneumonic tuberculosis may be conclusively made.

The broncho-pneumonic type is the most frequent, as acute tuberculosis is more prone to develop in children after measles or pertussis, those who are "run down," *i. e.*, such persons as are predisposed to the catarrhal type of pneumonia.

CHRONIC PULMONARY TUBERCULOSIS.

Chronic phthisis; Chronic Ulcerative Tuberculosis of the Lungs.

Under this designation is found the large majority of cases, presenting the great variety of symptoms and lesions which make up the well known and familiar picture of chronic phthisis.

Morbid Anatomy.—The disease process first attacks the apices of the lungs and thence extends downward, probably by inhalation of the virus. The right apex is more frequently affected than the left. (Osler—in 427 autopsies found 172 in the right, 130 in the left, and 111 in both.) From the apex the disease extends to the apex of the lower lobe of the same lung and then attacks the apex of the opposite lung.

The primary lesion is usually from one to one and one-half inches below the extreme summit of the lung and this is equally true when it attacks the apex of the lobe

below. Hence in physical examination the first evidence of the disease may usually be found in the supra-spinous fossa posteriorly, and just below the centre of the clavicle anteriorly. The primary lesion, when attacking the lower lobe, is first detected on the chest wall posteriorly at a spot opposite the *fifth* dorsal vertebræ. It is an axiom that "in a great majority of cases when the physical signs of disease at the apex are sufficiently definite to allow the diagnosis of phthisis to be made, the lower lobe is already affected." Hence, carefully examine this lower apex in suspicious cases.

It is interesting and important to remember that all the various processes and in every stage of development, may be found at one time in the same lung.

Lesions of Chronic Phthisis.—*Miliary Tubercles* are usually, but not invariably present. They develop in the alveolar walls or in the peri-vascular, peri-bronchial or sub-pleural connective tissue. They are found thickly grouped about the active lesions or distributed throughout the lungs.

Catarrhal or broncho pneumonia is most constantly present. Beginning in the terminal bronchioles it extends to the associated alveoli and both are soon filled with the products of inflammation in which the large flat aveolar epithelium predominate. In most cases there is a coincident pneumonic inflammation of the alveolar walls or frame work. These regions of inflammation and deposit constitute the

Areas of Consolidation.—These in a varying length of time undergo caseous degeneration. The process commencing at the centre of the area, gradually extending toward the periphery, encroaching more and more

through the inflamed tissues. This central caseous mass ultimately softens, becomes purulent and there is found the

Cavity or Vomica.—The presence and pressure of the purulent contents favor further ulceration and necrosis and the cavity steadily increases in size, intervening tissues are destroyed and contiguous cavities unite until a lobe or even a whole lung may be honeycombed with small cavities, or the intra-alveolar frame work may break down entirely and form one large excavation. Those cavities communicating with a bronchus may thus empty themselves and their contents be expectorated or otherwise they remain filled with purulent matter. In the more acute and rapid processes there is no lining membrane and the walls are of ragged necrotic tissue. In chronic phthisis the walls are firmer and lined with a smooth, well-defined limiting membrane which constantly secretes pus. Even this does not prevent the gradual enlargement of the cavity by disintegration of adjacent lung tissue.

The bronchi and blood vessels resist the ulcerative process longest and they are frequently found exposed in these cavities. Blood vessels thus weakened by the destruction of thin supporting tissues, dilate and often rupture, thus causing frequent hæmorrhages, sometimes severe or even fatal.

Sclerosis.—May take place in a tubercular-pneumonic area that has been checked by treatment or favorable conditions before the stage of softening. This occurs by the development of fibrous tissue around the area, encapsulating it, or distributed throughout the mass. The slower the tuberculous process from restraint by medical,

hygienic or climatic treatment, the greater the tendency and opportunity for healing by fibrosis.

Aside from the local processes above described there are changes in other organs and tissues as follows:

The Pleura is almost always involved. Inflammation may be simple, but is usually tubercular, showing adhesions of varying density and often with serous, purulent or hæmorrhagic effusion and with miliary tubercle or caseous masses in the thickened membrane.

The Bronchi are constantly affected with chronic catarrhal inflammation and the smaller tubes often show bronchiectatic cavities.

The Bronchial Glands are inflamed, swollen, and show caseous masses or purulent foci.

The Larynx is often involved and ulceration and distruction of the vocal chords and epiglottis is frequent.

Other Organs.—The brain, liver, spleen, kidneys, endo- and peri-cardium and the intestinal tract are usually involved in secondary tuberculous processes. The latter accounts for the troublesome diarrhœa often present late in the disease.

Variations in Onset.—A typical case setting in with fever, night sweats, cough, emaciation, anorexia, etc., is usually soon recognized, but there are many cases commencing in an atypical manner; they may be thus classified:

Fever group, in which there is fever of intermittent, remittent or continuous type with prostration and anorexia —symptoms not distinctly pulmonary but suggesting malarial infection.

Pleurisy group, with repeated attacks of pleurisy, usually the dry form but may be with effusion and retarded

recovery, gradually developing hectic symptoms pointing to the lungs.

Laryngeal group, showing huskiness, swelling, congestion and even ulceration of the laryngeal structures. These symptoms may be the first to excite suspicion but will be found secondary to established lesions in the apex of the lung.

Hæmoptysis group. In some cases a hæmorrhage is the first symptom to attract attention to the lungs, after which other pulmonary symptoms develop rapidly. Carefully examine and subsequently observe every case of hæmoptysis.

Bronchitis group, so often seen, so often overlooked until too late. A neglected or repeated "cold," receiving but little or irregular attention because seemingly of trifling import until a hæmorrhage, unusual loss of strength or weight, suddenly awakens to the true situation.

Symptoms.—These are divided for convenience of study into local and general.

Local Symptoms.—*Pain*. This may be present early and prove very distressing or may be absent altogether. It is usually due to the associated pleurisy and when so is some indication as to the locality of the lesions. There are often myalgic and neuralgic pains in various parts of the chest and soreness due to the strain of coughing.

Cough is almost universally present and remains throughout the course of the disease. At first it is dry and hacking, but later becomes hoarser and more paroxysmal with marked nocturnal aggravation. Laryngeal involvement gives a hoarse or husky quality to the voice or even aphonia. In a few cases cough is absent. By

its nocturnal aggravation preventing sleep and its severity inducing vomiting of food, it becomes an important factor in increasing exhaustion and malnutrition.

Expectoration is quite constantly present. At first is catarrhal in character. When softening occurs, it becomes more free and muco-purulent in character. Later when cavities have formed it is profuse, greyish or greenish yellow and purulent. Sweetish in odor or fœtid from decomposition. Most profuse in the morning from the night's accumulation. It now assumes the so-called "nummular" form, *i. e.*, isolated flattened masses, greenish grey in color, airless and sinking when spat in water. The presence of greenish gray purulent masses in the sputum, with other suspicious symptoms, should warrant the making of a microscopical examination. If such reveals the presence of the tubercle bacilli the diagnosis of pulmonary tuberculosis may be conclusively made. If in addition elastic tissue is found, it indicates that degeneration and softening has taken place. *Blood* is not infrequently present in the expectoration. It may vary from a mere trace, tinging or streaking the sputum, to a severe hæmorrhage of clear blood. When present in minute quantities so that the sputum is only tinged or streaked with it, it is due to bronchial hyperæmia. When there is free expectoration of blood it comes from an eroded vessel. Copious or fatal hæmorrhage is due to the rupture of a dilated or weakened vessel exposed in a cavity.

Dyspnœa. Is not a marked feature unless there are pleuritic pains, large pleuritic effusion or rapid and extreme consolidation. The absence of it in these cases with their greatly diminished lung capacity is explained

by the anæmia, or lack of corpuscular elements in the blood and the waste of tissue explains the lessened demand for oxygen.

Physical Examination.—It is well to remember that all signs may be present at one time in the same lung.

Inspection reveals "phthisical thorax," *i. e.*, unusual length, contraction, flatness and increased width of intercostal spaces. Lack of expansion and unusual flatness of supra- and infra-clavicular regions with projection of scapulæ, like wings, behind.

Palpation. Increased vocal fremitus and lack of expansion, particularly of supra- and infra-clavicular region.

Percussion. Degree of impaired pulmonary resonance varies with the stage and extent of the disease process. A flat and high pitched note over the diseased area, especially in clavicular region anteriorly, the supra-spinous fossa and inter-scapular region posteriorly with the arms folded. Compare the diseased with the sound side. An area of consolidation centrally located and surrounded by normal or emphysematous tissue may seem resonant.

Auscultation. Voluntary increased force of respiration is often necessary to demonstrate clearly. Feebleness of respiration, impaired expansion over diseased area. Do not confuse with the general feebleness due to muscular weakness and debility from other causes. Prolonged expiration which is of higher pitch than inspiration and separated from it by an interval. Both are higher in pitch and harsher than on the normal side. "*Cog-wheel*" respiration consisting of localized interruption of inspiration, when associated with other signs, is of value and is most frequently heard in infra-clavicular region anteriorly.

Bronchial rales when localized and with localized pleuritic friction sounds when associated with other signs are strongly corroborative.

Cavities. The various signs thereof are best demonstrated with the patient's mouth open. They are shown by persistent bronchial breathing and absence of dulness over a limited area. Tympanitic percussion note over limited region surrounded by dulness is the most characteristic. "Cracked pot" sound is present when a cavity communicates with a bronchus. A well developed cavity shows bronchophony, amphoric breathing and gurgling rales. Percussion note of a cavity varies with the amount of superimposed dull or resonant tissue.

General Symptoms.—*Fever.*—A daily afternoon or evening rise of temperature without apparent cause should excite suspicion of phthisis. Fever is the most important symptom. It is usually remittent or intermittent and frequent observations should be made during the day. Incipient tuberculosis with fever of an intermittent type may be mistaken for malarial fever in regions where malaria abounds. The temperature curve shows great variation in different cases, but its usual form is an afternoon or evening rise reaching a maximum (102° to 105°) between two and six P. M., and a morning fall reaching a minimum between two and six A. M. In the early part of the disease the fever is of the remittent type, but with the breaking down and suppuration of lung tissue and the consequent systemic contamination the fever becomes more hectic in character, *i. e.*, intermittent. The morning hours will show a normal or subnormal temperature, but late in the forenoon there will be a gradual rise, reaching a maximum from 6 to 10

P. M. Chills or chilliness may usher in the fever at any stage of the disease, but are most constant after destructive changes have taken place. A continuous fever with a variation of not more than 1° occurring during the course of chronic phthisis is of serious import, indicating the presence of acute pneumonia.

Sweat.—Drenching sweats are a most common and distressing feature and may occur at any stage of chronic phthisis, but are most frequent and severe after cavities have formed. They usually follow the fever paroxysm and consequently appear during the night or early morning hours. Late in the disease a sweat may appear after sleep during any hour of the day.

The Pulse.—Is feeble, rapid, and easily compressible. This rapid, compressible and easily accelerated pulse is regarded as an early diagnostic sign of phthisis when associated with other suspicious symptoms.

Emaciation.—Progressive anæmia and loss of flesh is a characteristic and prominent symptom of chronic phthisis. Do not mistake the brilliant eye, scarlet lips and flushed cheeks of the hectic fever for health. The loss of weight is an indication as to the progress of the disease. An arrest of loss or a gain, is a favorable sign. The great emaciation of the later stages of phthisis is seldom equalled in any other disease.

Larynx.—Laryngitis is a very frequent complication and follows the pulmonary development of the disease. The various tissues of the larynx are inflamed, œdematous, ulcerate and may be destroyed by extensive necrosis. Huskiness of the voice is the first indication, followed by aphonia with intense pain upon speaking, coughing and swallowing. Important because of its serious effect upon nutrition.

Nervous System.—Variously affected, but the most serious complication is cerebro-spinal meningitis. The mind is usually clear throughout the disease in spite of months of fever, pain and exhaustion. The consumptive is proverbially hopeful. This is characteristic.

Pleura.—Pleuritis is usually present. It is most often the dry form, but may be purulent. Pneumo-thorax results from the rupture of a cavity into the pleural sac, leading to hydro- or pyo-pneumo-thorax.

Gastro-Intestinal Tract. — The buccal cavity often shows aphthous ulceration, and the soft palate, tongue, tonsils or pharyngeal walls may be the site of tuberculous ulceration. If associated with laryngeal ulceration these become serious factors by their interference with deglutition and nutrition. Anorexia is common, especially in the later stages. Nausea and vomiting are often present, due to reflex causes, gastric weakness or violent fits of coughing. Indigestion is frequent from various influences upon the stomach and its secretions. Diarrhœa, due to tuberculous ulceration of the ileum or colon, is a most distressing and exhausting complication, especially in the later stages of the disease.

Other Organs.—In protracted cases the terminal phalanges become clubbed and the nails markedly curved over their ends. The *skin*, especially over the chest, shows the stains of pityriasis versicolor. Œdema of the lower extremities is present late in the disease from cardiac weakness. *Endo-carditis*, *nephritis* and *femoral thrombosis* may occur as complications.

Diagnosis.—A careful and thorough physical examination, with a close investigation of the symptoms and clinical history, supplemented by a microscopical ex-

amination of the sputum, will establish the diagnosis. The early discovery of the disease is of the greatest importance to the patient and this fact emphasizes the necessity of thoroughness of examination in suspicious cases. The earliest signs are discoverable by auscultation of the apices where evidences of bronchial breathing and the rales of localized bronchitis are dangerously suggestive. The presence of elastic tissue in the sputum proves distruction of lung tissue.

Prognosis.—Many factors enter into the prognosis. In general it is unfavorable, though well defined cases may be cured as shown by the fibrous cicatricial tissue and evidences of former cavities found post-mortem. Some of these doubtless underwent the so-called "spontaneous cure," *i. e.*, without special treatment, and in some cases without the disease being suspected, nature by the formation of fibrous tissue isolated or filled the diseased area with scar tissue. Perfect recovery from well advanced pulmonary phthisis never occurs. The extent and stage of the lesions and especially the patient's persistence in treatment and ability to secure the benefit of proper diet, hygiene, climate and treatment all influence the prognosis. Tubercular meningitis, hæmoptysis and pneumo-thorax may bring on a fatal termination at any time. Laryngeal and gastro-intestinal complications are most unfavorable. Rapid emaciation and feeble digestion are especially unfavorable. In acute pneumonic phthisis the prognosis is always bad. The average duration of the disease is from two to three years.

Prophylaxis.—The danger of infection is practically only through the sputum. The latter should be caught

in a proper receptacle and burned and not spat about upon the floor, street, or in handkerchiefs, where it may dry and be distributed and inhaled by others. The patient should sleep alone and the tuberculous should not marry. Infants and young children are most susceptible to infection. Hence a mother with tuberculosis should not suckle her infant and a child of tuberculous parents or of a family prone to phthisis should be most carefully watched and every attention given to its hygiene, diet, exercise, and minor ailments. Give special attention to the nose and throat and remove adenoids and hypertrophied tonsils. A family or the young persons in a family, so predisposed, should remove to a suitable climate before trouble develops. The milk and meat supply should be carefully inspected by skilled experts for the good of the whole community.

Treatment.—*General Measures.*—Nutrition controls the situation; as Osler aptly says, "make the patient grow fat and the local disease may be left to take care of itself." There are three indications in treatment. First, secure maximum degree of nutrition. Second, use such local and general measures as favorably influence the tubercular process. Third, alleviate symptoms.

Fresh Air.—Secure pure air, equable temperature and maximum amount of sunshine. A patient with a temperature of 100° or over should be at rest in bed. When the temperature remains below 100° the patient may take moderate exercise and gradually increase it with growing strength and endurance, but not to the point of fatigue or sufficient to cause a rise of temperature. Unless the weather is rainy or blustering the windows of the patient's room may be opened freely, avoiding a

draught, or the patient, well protected, may sit, recline, or be carried on a cot to the veranda or lawn, and thus left exposed to the fresh air and sunshine for the greater part of the day. Low atmospheric temperature nor the cough, fever, sweats or hæmoptysis do not contra-indicate this exposure to the air and sun, both of which inhibit and destroy the bacilli. At night the sleeping room should be well ventilated.

Climate.—A patient with well developed cavities, hectic fever, sweats, and emaciation should not be sent from home. The question of change of climate and where to send such patients is a matter for careful individualization and judgment. Briefly stated, cases with moderate, unilateral disease, limited to the apical region, and without much cavity formation or emaciation and in fair physical condition, do well, and stand a good chance of recovery from outdoor life anywhere, but especially in high or moderate altitudes, whether warm or cold, *i. e.*, Colorado, Arizona, New Mexico, Northern Maine and the mountains of Virginia or the Adirondack region.

In patients with bilateral disease and cavity formation there is little hope of permanent cure, and these do best in warm, low altitudes, *i. e.*, Southern California, Florida, South Carolina and Georgia (Aiken, Thomasville or Summerville).

Nervousness, emphysema, cardiac or kidney disease contra-indicate high altitudes.

Hygiene. — Phthisical patients should wear woolen underclothing, varying the weight to suit the season. They should, unless very feeble, resort to well directed exercise, carry the shoulders well thrown back and constantly think to take full, deep respirations and twice or

thrice daily take breathing exercises. Warm bathing often enough to insure cleanliness and cold sponging of the throat and chest accompanied by deep breathing with friction and massage of the upper chest to aid in nutrition and expansion of the apices.

Diet.—This should receive special attention as it is most important. Each case must be studied as to personal idiosyncrasies and the digestive power and the diet varied or modified to suit the situation. Generally speaking, a liberal meal of the various articles of food is most suitable at the usual meal hours, while between meals and at bedtime a portion of some liquid or concentrated nourishment should be given, *i. e.*, milk, egg in milk, koumyss, broth, gruel, grapes or grape juice or one of the various predigested foods. Cream, butter, fat meat and oil are of value when they can be taken and are tolerated by the stomach. Malt beverages may whet the appetite and increase weight.

The stomach must be catered to and when it is weak or there are intestinal complications the diet must be modified to suit the individual case.

Stimulation.—Judgment should be used in the employment of stimulants. The routine administration of alcoholics is of no particular benefit. A little good red wine with meals may aid digestion and improve nutrition. Port, sherry or tokay wine may be taken alone or with an egg between meals. The indications for the stronger alcoholics are in the later stages when there is great prostration, weak heart, anorexia, emaciation and general feebleness. They are particularly required in the early morning hours during the period of subnormal temperature and exhaustion following the sweat. Whiskey or