feet again financially, for he went to work at the bottom. Restraint was absolutely essential in compelling this young man's return to health, but as rapidly as possible motive was substituted, and today he is what he is because of the persistence of motives thus inculcated.

Compelling Health—The physician's task in assuming charge of his patient is a complex one. First, he must bring a character of worth and strength based on a life of ideals fairly lived. An attitude of firm, wholesome kindness must be his. He becomes a dangerous influence when the suggestion of his presence does not inspire hope and confidence. Most earnestly, thoroughly and wisely must he make the physical estimate of his patient's needs. He must consider the influence of the patient's environment, his work, his family, his associates, and, finally, with equal skill must determine the patient's attitude. This attitude will probably be abnormal, and the first step in modifying it is to shift one's own background of thought to the patient's, to see why and how he thinks and feels and does. Therein the physician finds his first real hold upon his patient, for he creates a common ground of sympathy. This is true tact. This done, the doctor must guide his charge away from his damaging position till the viewpoint has been changed to the normal. The physician who does things brings authority to his cases—the authority of skill, the authority of self-confidence—and he frequently wisely augments this by consultation. Weak, indeed, is the practitioner who does not control his patients. There is, unfortunately, a certain perverted class of sufferers who respect no will nor law but their own. Patients paralyzed by fear, by superstition, or bound by bonds of selfishness, viciousness or self-satisfaction, who must be compelled to return to the normal. In extreme cases legal authority is required to make possible the rescue of these otherwise hopeless sufferers.

Conclusion—The waste of unnecessary invalidism is appalling. From the social and economic standpoint it is criminal. To the family physician comes the unrivaled opportunity of determining the practical management of this host of unnecessary invalids. This he cannot do until he looks beyond the findings of the stethoscope, microscope and test tube. He must analyze his patient's mentality; he must recognize the large and increasing class of psychic sufferers, and he must match his mind, his character, his training with these devastating mental forces which are multiplying nervous invalids, and thus most perfectly fulfill his mission. Let us not forget that action is the whole expression of life, and that without productive activity humanity is simply a drifting derelict, without port or harbor,

a merace on the high seas of life, until some merciful gale puts it out of existence on the rocks of time.

DISCUSSION.

Dr. J. C. Walton, Richmond, Va.—I want to thank Dr. Carroll for his most excellent paper, which, I am sure, has been a source of pleasure and profit to us all.

As Dr. Carroll well says, health is fundamentally a mental state. Dr. Carroll is doing work strictly along original lines, and his system of exercise-and-work therapy is certainly unique and worthy of investigation. In a recent visit to Dr. Carroll's sanitarium I was very much impressed with the results the doctor is getting in his treatment of alcoholic and drug addiction, and was forcibly reminded of the advice that the able and eccentric Abernathy gave to one of his idle rich woman patients, "Madam," he said, "live on a sixpence a day and earn it." The doctor utilizes the forces of nature, the vis medicatrix nature. He teaches his patients the importance of right living, and, as Sam Jones says, to quit their meanness. Being familiar with this line of work, I have been very favorably impressed, not only with the doctor's results, but also with his rational system of therapeutics.

In conclusion, I feel sure that if anyone present can have the privilege of seeing Dr. Carroll's work that they will be amply repaid for their labor.

SYMPTOMS AND CLINICAL DIAGNOSIS OF BUBONIC PLAGUE.*

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Sydenham has given us the most accurate of the older descriptions of this disease. Writing of his own observations of the plague in London in 1665 and 1666, he says:

"The first attack is almost invariably ushered in by chills and rigors (such being also the accession of intermittent fevers), which are followed by violent vomiting, by pain in the region of the stomach like that of the pressure of a screw, burning fever and its usual crowd of concurrent symptoms. These affect the patient without intermission, until either death itself or else the favorable breaking out of buboes or of parotid abscesses. Hereby the morbid matter becomes eliminated and relieves them from the appalling crisis.

"Occasionally it happens that the disease lights

*Read at sixth annual meeting of the Southern Medical Association, Jacksonville, Fla., Nov. 12-14, 1912.

upon the patient without any premonitory signs of fever whatsoever, so that, even whilst engaged in his common business, a man may be suddenly struck down—an eruption of crimson blotches being the only forerunner of his quickly coming death. It is important, however, to remark that death thus suddenly rarely happens, except during the beginning of epidemics of more than ordinary severity. In years when the disease has been sporadic and during the remissions and decline, they have never been observed. It happens also that at times tumors may break out without either fever or any other important symptom as their precursors; although I suspect, for my own part, that chills or shivers, in some slight degree or other, and more or less perceptible, invariably precede. Those to whom this happens may walk about in public as usual, and attend to the common duties of life-like healthy men, taking no thought of regimen.*

The last description corresponds to a mild type of plague which occurs in most epidemics. It has been named *pestis minor*, but is of the greatest importance from the standpoint of public health; for as in the case of other infections alterations in virulence of the bacteria may occur in a comparatively short time and a suppurating bubo even in a case going on to recovery may be the means of widespread infection.

The classical disease picture which indeed furnishes the name to the disease is that of an acute septic lymphadenitis with extensive involvement of all lymph structures and general sepsis, chill, fever, depression, pains in head, limbs and back, anxiety and depression. The temperature rises gradually until the third or fourth day when a remission occurs and general enlargement of the superficial lymphatic glands takes place. Then a further rise of temperature ensues and the patient presents a picture of severe sepsis—fever, delirium or stupor, tongue dry and brown, teeth covered with sordes, twitching of muscles, etc.—except for the absence of emaciation similar to a badly treated and badly fed typhoid in the third week of the disease. Suppuration may occur at the point of original infection, oftenest on the legs, producing consecutively a vesicle, a pustule and perhaps finally a phlegmon; the phlegmon may occur in the glands in which the lymphatics of the region of original infection center or metastatically at any other point in the body.

There is considerable variation in the distribution of the primary bubo. Von Russell in 2,700 cases examined, found 69.7 per cent on lower limbs; 21.5 per cent in axillae and 8.8 per cent in the cervical region. It is a matter of considerable prognostic import where the primary bubo is located.

Enormous secondary lymphatic involvements may cause death through pressure on surrounding structures. This is much more apt to occur when the primary bubo is in the cervical region. Cervical bubo may be followed by mediastinal bubo causing bronchial or tracheal pressure. These may be located by percussion. Tonsillar secondary bubo may block the pharynx and necessitate tracheotomy. Abdominal glands may become secondarily enlarged and produce tender masses which are palpable through the abdominal wall and may give symptoms of acute abdomen.

The legs being the most frequent point of original infection, the femoral group of glands is most often first involved, primary bubo. Infection quickly extends to the inguinal glands, secondary bubo; and surrounding tissues become swollen and infiltrated and painful. Subsequently all lymph nodes in the body may become enlarged and tender from an extension of the infection, tertiary buboes. These where superficial may be palpated and aspirated for diagnostic purposes.

The spleen is palpable often as early as the first day of the disease. It is soft and smooth at the edges and extends two or three fingers' breadth below the costal border.

In few other acute infections is there such rapidity of involvement of heart muscle and vessel walls. The pulse becomes weak and rapid.

Hemorrhages are general into the skin and under serous membranes. These occurring at the height of the disease, usually after four or five days, often precede death, and give an appearance to the body suggesting the name, "black death." The tendency to skin hemorrhages varies in different epidemics.

The recent outbreak of plague in Manchuria has been characterized by great preponderance of cases of the pneumonic type. The lungs seem to become the seat of the primary infection. The pneumonia is of the lobular type. The physical signs are identical with *Pneumococcus pneumonia*. The sputum is more bloody and less tenacious and smears show *B. pestis* in enormous numbers. As a rule the respirations are more rapid, usually over fifty, and the pulse weakness develops immediately. This type of the disease is usually fatal in three days. The mortality is nearly 100 per cent. Pneumonia may be primary as above described or occur later in the disease as a metastatic process. The symptoms and prognosis of the case from the time of the development of a secondary pneumonia are like those of the primary type.

The septicemic type of the plague Sydenham has graphically described. In this type of infection neither buboes nor pneumonia are developed. Death occurs

*Reference Handbook of the Medical Sciences, Vol. 2, page 509.

before the lymphatic glands are to any extent enlarged. This septicemic type of plague fortunately is not common.

The appearance of the patient sick with bubonic plague is somewhat similar to that of one under the influence of alcohol. The face is swollen, the eyes injected. There is a general loss of co-ordination, staggering gait, thick and stammering speech. This speech disturbance frequently extends into convalescence and with persistence of lymphatic enlargement and recent scars of suppurating buboes, may furnish the clue to identification of a previously unreported case.

The recognition of cases of bubonic plague where it is known to exist presents small difficulty to the physician. It is the identification of the first cases, especially if they are of mild type, which will present the severe problem in diagnosis. In a sus-

membered that in epidemics cases do occur in which the cervical glands only are involved without enlargement of the salivary glands themselves. Malarial fever and typhoid may be confused with plague. However, absence of lymphatic enlargement and careful blood examinations would serve to exclude these.

Finally, let this be emphasized, the early identification beyond any doubt of bubonic plague depends upon the microscope. It is the duty of the attending physician to submit to the bacteriological laboratory slides made from the fluid aspirated from every suspicious bubo and from sputum in every case of pneumonia showing more than ordinary depression at the outset with a bright red sputum instead of the typical rusty sputum of ordinary pneumonia. The services of the public bacteriologist should be available. Possibly it might be wise to require the specimens to be submitted.

The only hope of limiting an outbreak of plague is that of a prompt diagnosis of the disease. Today every seaport of the world is menaced by plague and the menace will be still further increased by the opening of the Panama Canal. It, therefore, becomes the duty of every one who practices medicine in a seaport to keep constantly in mind the possibility of encountering the disease. To this end examination of the superficial lymphatic glands during the progress of every acute febrile case becomes a matter of necessary routine.

THE DIAGNOSIS OF PLAGUE.*

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Plague Bacilli. Smear from Lymphatic Gland of Man. (Cut from Photograph of Author's Slide.)

picious case careful and continuous observation of the superficial lymphatic glands should be maintained and puncture with the needle and examination of aspirated fluid made by smears and culture methods.

Veneral buboes should present little difficulty of diagnosis. There is usually the original focus infection in evidence. The bubo is more superficial than the bubo of plague.

Mumps, with extensive cervical enlargement, may be confused with cervical plague bubo. However, the involvement of the salivary glands would serve to point the way to the proper diagnosis. In considering the difficulties from mumps it must be re-

Plague was recorded even as far back as ancient times. Before the time of Christ reference is made in the Bible to a disease that killed the mice of the field. (Castellani and Chalmers: *Manual of Tropical Medicine*, 1910.) Numerous epidemics overran Europe from the early centuries in the Christian era until the seventeenth century. The "black death" of the fourteenth century is said to have destroyed one-fourth of the whole population of Europe. (Osler, *Practice of Medicine*, 6th Ed., 1906.) This disease is not only of interest to us in history from its widespread epidemics and heavy mortality, but it still appeals to us through its present-day world-wide dissemination, a veritable pandemic, with thousands of fatal cases daily. Of course, the heaviest death toll is in countries where little of sanitary science is carried out. For instance, there were more than