

Scientist" who has made some reputation by his delirious theories, was, according to a Boston physician, brought up on opium. His mother was a narcotic, and to protect herself, gave her son opium freely in early life. He grew up undersized, and with a highly sensitive brain, full of delusive dreams and fantasies. This was another form of opium diathesis.

The second fact that I would note is that opium in infancy acting on the most unstable organism, the brain cells and centers, not only retards but prevents healthy physiologic growth. In defective heredity this is permanent, although it may be concealed until later in life. This physiologic action of exaltation and depression, the latter being the principal stage, is manifestly toxic and injurious from the functional derangement which follows. Where no disturbance is recognized, the real danger is concealed. The cell growth and functions suffer, mechanically, nutritionally and psychically, by checking activity, diminishing nutrition and changing direction and purpose of action. This is true of opium in all cases. Sometimes one effect is more prominent than others. In DeQuincy the psychic action was prominent. In some cases the anemia shows in the disturbance of nutrition, and in others the depression and suppression of organic activity is apparent.

The third fact to be remembered is the concealed danger from opium-drugging in infancy. If only neurosis is present, if defects of growth and function exist, opium will of necessity increase this condition. Anemia, exhaustion and perversion of organic activity follow. If some temporary state is present, opium, by covering up the pain-signal is not curative, but may be destructive in many ways not easily recognized until later in life. No one can tell whether this danger begins with the first dose or only after a succession of doses.

Lastly, the magnitude of this danger is not recognized as it will be in the future. Neurotic disturbances, obscure and open, and toxic diseases of many forms, have an early history of opium drugging. The ignorant mother who uses soothing syrups freely, to suppress the irritation of the infant, is not the only offender. The routine, and often thoughtless, physician who uses opium freely in infantile prescriptions is responsible in many ways for the wrecks of later life. The toxic cases under my care are striking illustrations of this evil. Inquiry in others brings out this cause with great frequency. While it is difficult to narrow down the etiology to this one factor, it is clear that the danger from this source has been and is a potent and wide-spread cause. We need more clinical researches and clinical studies in this direction.

THE BUBONIC PLAGUE IN SAN FRANCISCO.*

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We have always regarded the plague as something very distant and impossible, and have read of its ravages in India and China with much the same feeling of composure and security that we read about an uprising of the natives in Madagascar. Or perhaps we have considered it as a matter of historic interest on account of the fearful epidemics which in pre-sanitary days used to sweep over Europe, devastating countries and hardly leaving enough people behind to keep up the archives and records of the state. Even now that it is among us, and in America for the first time, there seems to be a

tendency to underrate its importance and dismiss it without a thought, as a scare designed for base political motives.

While I do not believe in becoming unduly excited about it, or in publishing far and wide that there is plague in San Francisco, I do not think that we should try to deny among ourselves the very existence of it, but should accept the situation as it is and do our best to stamp it out while it is still within our power. It would be folly to ignore its presence and allow it to increase to such an extent that the national government would be compelled to step in and take from our hands the work of fighting it and perhaps quarantine the whole city with U. S. troops, thus advertising to the world that San Francisco was not only financially negligent in the face of an epidemic of a disease which is guarded against by the U. S. Marine-Hospital Service with more watchfulness and dread than any other.

San Francisco should look at the history of Oporto, and profit by her experience. The bacteriologist who announced the first case, in January, 1899, narrowly escaped being mobbed. The health authorities were hampered by the merchants and the press, who harped on the injury to trade caused by the announcement of the existence of plague which the laymen, in their infinite wisdom, declared did not exist. The health authorities were refused assistance until finally so many cases appeared that the government stepped in, surrounded the city with a cordon of soldiers, absolutely stopping all travel and business, and it was only after the lapse of one year, and after the experience of a partial famine, that the city was released and declared no longer infected. In the meantime its citizens had parted with the small sum of \$7,000,000, a good deal of money, but the probability is that by that time, even the omnipotent and scientifically wise press had arrived at the conclusion that their lives were more valuable than their business.

Just how the disease was introduced into this country is a mystery, as the first case discovered was in a Chinaman who had been in Chinatown sixteen years. The probability is that he was not the first, and this theory is strengthened by the fact that there had been an increased mortality in that district during the months of January and February. During those months there were 97 deaths reported from the Mongolian quarter, and of these 20 were ascribed to lobar pneumonia, 5 to bronchopneumonia, 4 to typhoid fever, and 7 to acute miliary tuberculosis. Now all of these diseases, in the beginning of an epidemic of plague, should be regarded with suspicion, and examined bacteriologically, for they are simulated very closely by the pest.

The assistant city physician, whose duty it is to inspect all dead Chinese who have died without attendance by a regular physician, is at a great disadvantage in arriving at the cause of death. He simply sees the body after death, and by questioning the relatives or undertaker, who are ignorant and use very broken English, he makes a guess at the cause of death, taking into account the appearance of the body. According to the Caucasian statistics of San Francisco, the number of deaths from pneumonia, typhoid, and miliary tuberculosis, to every 97 deaths, would be 12.3, whereas the assistant city physician, with the means at his command, has been forced to consider that there were 36 of these cases out of a total of 97 deaths for the two months. Since the plague can readily be mistaken for these diseases, we are justified in the suspicion that some of these cases were plague. Nor is the fact that we have not now a wide-

*Read before the San Francisco County Medical Society.

spread epidemic proof to the contrary, for it has been the history in other parts of the world that the plague gets a foothold very slowly and insidiously. There is a first case, and then it may be a couple of weeks before the second, and they may appear occasionally and at intervals of several days or weeks, until the houses and the quarter become infected, and then the real epidemic breaks out, and hundreds of cases occur. I will commence the account of the recent occurrences by history of the first case as supplied by the Chinese Consul. We have found that the only way we can get histories of these cases is by turning them over to the police department, and by means known to the detectives they find out a few items.

CASE 1.—Wing Chuc Ging, aged 41, in Chinatown sixteen years, died March 6, 1900, in the basement of 1001 Dupont Street. He worked in a woodyard on Pacific Street, and stated to Wing Ging, his brother, that he had been sick for six months. On February 7 he called at the office of Dr. Chung Bu Bing, 309 Dupont Street, complaining of headache, tired feeling, pain in the head, back and chest and fever. The symptoms and pain in urinating had been present in the bladder for two or three days. A diagnosis of inflammation of the bladder was made and medicine given for this. On February 14, the patient consulted Dr. Wong Wo, 766 Clay Street, and told him he had contracted gonorrhea. He had no fever and no pain except in the genitals, complained of a lump in the right groin and was somewhat lame on that side. He also stated that he had a urethral discharge, but would not allow a special examination. He was given some medicine to relieve the difficult and painful urination, and a plaster to apply to the lump. No surgery was instituted and no further medical treatment. He was in bed two weeks, but would not tell his brother of his trouble. A few days before he took some Chinese medicine which he obtained from Dr. Wong Wo. This caused vomiting, profuse diarrhea, and collapse, followed by death.

From the history this was evidently an ambulant case, in which an exacerbation occurred, marked by the vomiting, diarrhea, and collapse ending in death. I saw this patient with Dr. Wilson, in the basement of the Globe Hotel, on March 6. I observed that there was a swelling of the inguinal lymphatic glands on the right side. There was no suppuration and the skin was unbroken. The glands about the saphenous opening were enlarged, and in this situation there was an open sore, which was dried and partially healed over. As a mere matter of routine I removed some of the glandular tissue, not expecting to find anything in it. No autopsy was performed. Smear preparations from the interior of the gland showed large numbers of a small short bacillus resembling the bacillus of bubonic plague. Isolation of the organism was commenced by culture methods. The next day a rat, guinea-pig and monkey were inoculated with an emulsion made from the gland removed from the Chinaman. The following is the account of the results obtained:

(The municipal laboratory being short of animals, and short of funds, and as it was deemed unsafe to conduct experiments with plague inside the city limits, the invitation of Dr. Kinyoun to use his laboratory was accepted and the inoculation experiments detailed below were performed in the Government Laboratory at Angel Island, by Dr. Kinyoun of the U. S. Marine-Hospital Service, assisted by Dr. Agnes Walker and myself.)

March 7, 1900, 2 guinea-pigs—each 700 grams—1 half-grown white rat, and 1 monkey, were inoculated with an emulsion made from a piece of glandular tissue removed from the body of Wing Chuc Ging on March 6, 1900. The animals were

placed in appropriate cages, protected in the usual manner. Cover-slip preparations were made from the glandular tissue, in which were found a number of micro-organisms, suspiciously like the bacillus of plague both as to their morphology and staining. Cultures were made from a portion of the tissue. March 8, the animals were in good health. March 9 and 10, there was no change and the animals ate well. March 11, one guinea-pig was found dead at 8:30 A.M., the other quite sick, the white rat dying, the monkey dull, listless, and would not eat; at 11 a.m., both the rat and sick guinea-pig were dead.

Post-mortem examination of guinea-pig No. 1.—On section there was an extensive edematous area on the left side extending from the axilla to the groin, the center of which contained a large quantity of exudate. The tissues about the site of inoculation were necrosed. The inguinal glands were considerably enlarged and reddened. Cover-slip preparations made from the exudate, at the point of inoculation, showed almost a pure culture of a short bacillus with a tendency to bipolar staining. The groupings of these organisms was quite characteristic. The peritoneal cavity contained a small quantity of bloody serum. The spleen was enormously enlarged, fully three times its normal size; the surface was very much reddened and covered with small yellowish dots; the spleen was also very friable. Cover-slip preparations made from the spleen showed an enormous number of a short diplobacillus, quite rounded, with a marked tendency to bipolar staining. The liver was enlarged and contained several yellow spots similar to those observed on the spleen. The mesenteric glands were not appreciably enlarged. The pericardium contained a considerable quantity of pale, straw-colored serum. The heart's blood was fluid and contained large numbers of the same organism as that found in the spleen, and at the point of inoculation. The lungs showed no evidence of change. The pleura contained about 3 c.c. of bloody serum. Cultivations on agar and in bouillon tubes were made from the spleen and heart's blood.

Post-mortem examination of guinea-pig No. 2.—The body was well nourished. On section the whole left side of the abdominal wall was in a state of coagulation necrosis, more intense at the point of inoculation, and extending from the axilla to the groin. The axillary and inguinal glands were much enlarged and reddened. A small hemorrhage was noticed in the inguinal region. The peritoneal cavity contained a small quantity of bloody serum. The spleen was very much enlarged, fully as much as that observed in guinea-pig No. 1; it, however, did not contain the yellow spots. The liver was engorged and contained several yellow spots on its anterior surface. Cover-slip preparations made from the spleen showed the same short bacillus, with rounded ends, presenting the same poles as those found in the first pig. The pericardium contained a considerable quantity of bloody serum. The heart's blood was fluid, and contained great numbers of the same short bacillus, which took the characteristic stain. The lungs were to all appearances normal. The pleural cavity contained a small quantity of bloody serum. A cultivation on sugar and in bouillon was made from the spleen and heart's blood.

Post-mortem examination of white rat.—Dead about two hours. At the point of inoculation there was a small area of coagulation necrosis, surrounded by a considerable area of edema. The peritoneal cavity was dry. The spleen was enlarged to about four times its natural size, very dark in color, and friable. Cover-slip preparations made of splenic pulp and stained with aniline colors, particularly thionin, demonstrated enormous numbers of a short bacillus with rounded ends, staining more deeply at the poles. The heart's blood contained the same organism in large numbers.

Post-mortem examination of monkey (March 13).—It had been dead about six or eight hours, having been inoculated on March 7, with an emulsion made from a piece of glandular tissue removed from the groin of the dead Chinaman, and having died on the morning of the 13th, after showing signs of illness for two days. At the point of inoculation, which was in the left breast, there was considerable coagulation necrosis. Subcutaneous edema was well marked, especially on the left side over the abdomen. The axillary lymphatic glands on the left

side were enormously enlarged, forming a mass as large as a walnut. There was no enlargement on the opposite side. On section the gland showed congestion and hemorrhages into the gland substance. Cover-slip preparations were made from the interior of the gland and stained with thionin. They showed the presence, in large numbers, of a short coccobacillus, with rounded ends, staining more deeply at the poles. The spleen was greatly enlarged, dark and friable and contained the same organism in enormous numbers. The pericardium contained a considerable amount of turbid fluid. The heart's blood was fluid and contained great numbers of the organism described above. The lungs showed the presence of a well marked pneumonia.

The organism which was present in pure culture in the lymphatic gland of the Chinaman and which was the cause of death of these animals I have obtained in pure culture from all these sources, first from the gland of the Chinaman, and from the heart's blood and spleen of the inoculated animals. I found that it had the following characteristics and have compared it with a culture from Bombay isolated by Pozzi.

Bacillus Pestis, San Francisco.—A small, short, thick bacillus, with rounded ends, frequently occurring in pairs, and in agar and bouillon cultures in short chains. They are non-motile and no spore formation was observed. Colonies on agar plates, in seventy-two hours at 35 C., were .5 to 1 mm. in diameter, round, semitranslucent, with a bluish or opalescent tinge. The surface is rounded, smooth and moist looking, and the consistency in older cultures tough and stringy. The bacillus was a facultative anaerobe and did not liquify gelatin, and was pathogenic to white rats. It stains readily with the aniline dyes, frequently taking the stain more deeply at the ends, the so-called pole staining. This peculiarity was more marked with the carbol fuchsin, but thionin seemed to give the most satisfactory results. In old cultures there were many swollen and rounded forms, which showed the bipolar staining in an exaggerated manner, causing them to almost have the appearance of little circles and crescents. It deodorized by Gram's method. Bouillon was not clouded, and a film formed on the surface, and settled downward in a fine cloud when the tube was jarred. Bouillon cultures answered to Widal's test with Yersin's serum in a most typical and satisfactory manner.

In addition to the above-described case, I have assisted Dr. Wilson in the post-mortem examination of three other Chinese, two of whom I feel positive were plague cases, but I have been unable to prove this for the following reasons:

The cases were in such an advanced state of decomposition when I saw them that there were many organisms present in the blood and organs in addition to one which resembled the bacillus pestis. The animals which were inoculated from the tissues of these cases all died, but of a mixed infection. I succeeded in obtaining a tube of nearly a pure culture of what was morphologically the bacillus pestis from Case 3, and a rat was given the entire tube at one dose, with the result that it died in thirty-six hours. The post-mortem did not show sufficient bacilli in the organs to clinch the diagnosis of plague. My theory is that there were enough toxins present in the culture to kill the rat before the organism had time to multiply in its body. A guinea-pig was inoculated from this rat, but it died of pneumococcus infection, the plague organism having totally disappeared in the passage through the bodies of the two animals. As I have no more material nor cultures from this case I will never be able to prove it was plague, by inoculation experiments, although the post-mortem appearances and the presence of the organism in the blood would ordinarily be considered sufficient evidence. The results obtained in the other two cases were practically the same as in the one just described.

I am of the opinion that the thorough disinfection and cleaning up of the Mongolian quarter, which the San Francisco Board of Health has been carrying out with considerable vigor, has been of invaluable service in checking the spread of the disease before it had fairly gained a foothold. Vigilance should not yet be relaxed in the least, for it would not be surprising if other cases were discovered in the near future. In such event the measures taken will have to be most radical, for the re-appearance of the pest will be evidence that a focus of infection has been established which nothing short of fire will obliterate.

VESICORECTAL ANASTOMOSIS.

WITH SPECIAL REFERENCE TO THE TREATMENT OF EX-STROPHY OF THE BLADDER.

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EXPERIMENT 4.—A male pug cur, weight 22 pounds, was operated on May 6, 1899, and killed May 21. At the post-mortem the abdominal incision was found firmly united. The omentum was partly adherent around the site of the anastomosis. The bladder was empty and greatly contracted. On opening the bladder no appreciable changes were noticed, and the opening between the bladder and rectum admitted the tip of a finger. The rectal mucosa below and a slight distance above the fistulous opening was reddened, probably by the urine. Both kidneys looked bluish, not enlarged, nor thickened; the capsule stripped easily and was not thickened. On cut section the pelvis was found undilated, perfectly smooth and to all appearances normal. The proportion of cortex to medulla was normal. All other organs were found to be perfectly healthy.

Bacteriologic Examination.—A blood-serum and a glycerin-agar tube were inoculated from the pelvis of each kidney. Of these four culture-media, three remained permanently sterile. One blood-serum tube on the third day showed a moist, shiny, whitish growth which liquefied the culture-soil. The growth consisted of very small bacilli, the character of which was not studied any further. They were not colon bacilli, and their appearance was probably due to contamination. At the site where the anastomosis was made the tissue appeared perfectly smooth and normal. No redness nor swelling was noticeable to the naked eye. Microscopic sections made from this part included both the bladder and rectum.

Microscopic Examination. (Figs. 5 and 6.)—In the rectum the following conditions were noted: The intestinal and bladder walls were completely united, and blended in such a manner that the two tissues formed an acute angle of about 80 degrees, which projected into the bladder. The intestinal surface was lined by mucous membrane, the bladder surface by stratified epithelium. Both these tissues presented a normal appearance. They did not come completely together. On one side the intestinal mucous membrane was thinned out; on the other, layers of epithelial cells lining the bladder were gradually reduced to a single layer. It appeared as if from here the epithelial cells were in the act of growing over to reach the rectal mucous membrane, although a small strip of tissue had not yet been covered by epithelial cells. Here connective tissue laid free to the surface. This tissue consisted of cells of an embryonal type and of fibroblasts. The union between the bladder and rectal walls was complete throughout its entire thickness. One could not distinguish—at the line of the union—what was originally bladder and what was intestinal tissue. The mucous membrane of the rectum, and the epithelial lining of the bladder entirely disappeared at the line of