this patient was undoubtedly August 13, twenty-one days after vaccination. This would probably indicate a late infection should one consider the vaccine virus the immediate and only cause. On the other hand, Anderson [2] has shown that in post-vaccination tetanus the average incubation period, measured from vaccination to the onset of symptoms is 20.7 days with the average mortality of 75.2%. This high mortality rate is similar to that in cases of tetanus with an incubation period of ten days or less. Therefore it is evident that if the onset of symptoms are more than ten days after vaccination, as in this patient, it is most probable and very possible that the infection was not received through the virus used in vaccination.

Summarizing the evidence gathered relative to this case, one could easily consider that the infection was due entirely to lack of care of the wound with a direct responsibility placed upon the parents of the child. The proximity of the stable is interesting. Therefore this case is a fair illustration of the fallacy of post-vaccination tetanus supposed to be due to direct contamination of the vaccine virus in its manufacture.

References.

1. "Accidents Following Vaccination." W. F. Elgin. American Journal of Public Health, Vol. 5, No. 9.
2. "Post-Vaccination Tetanus, Studies on Its Relation to Vaccine Virus," by John F. Anderson, Director, Hygienic Laboratory, U. S. P. H. S. Reprint No. 289, Public Health Reports, July 16, 1915.

DEATH DUE TO STATUS LYMPHATICUS FOLLOWING AN INJECTION OF DIPHTHERIA ANTITOXIN.

By WM. C. HASSLER, M. D., Health Officer, San Francisco.

On January 3, 1917, the San Francisco Department of Health was requested by the family physician of X. to administer a prophylactic dose of diphtheria antitoxin to Thomas X., age 7 years, who had been in contact with his sister who was at the time ill with diphtheria and who had been removed to the city's Isolation Hospital.

To comply with this request Sanitary Inspector Dr. C. of the Board of Health proceeded to the family residence of X., found Thomas to all appearances a normal, healthy child, and with the assistance of the mother, the inspector cleansed with warm water and soap the right scapular region of the boy's back, then painted the site of the injection with tincture of iodine and injected subcutaneously 1000 units of diphtheria antitoxin of a standard brand, the time of its potency guaranteed to November, 1917.

The sanitary inspector left the house some ten minutes after the injection. At the time of his leaving there were no symptoms of collapse. The child complained of pain at the site of the injection, and ten minutes later he was seized with violent cramps, had great difficulty of breathing and passed off in what the mother called a "severe convulsion."

A postmortem of the body was made by Dr. William Ophüls, Professor of Pathology in the Leland Stanford University Medical School, and the following were the necropsy findings:

Name, Thomas X. Age, 7 years. Died, January 3, 1917.

History: Died in 20 minutes after subcutaneous injection of 1000 units diphtheria antitoxin.

Examination: Strongly built, well nourished boy about 7 years. Plentiful, dark blonde hair; eyelid lashes, eyebrows darker. Marked cyanosis of face, neck, shoulders, upper part of arms and finger tips. Skin light, thin and few small freckles over nose. Cervicle lymph glands just palpable, also axillary and femoral glands. Teeth show two permanent incisors in upper jaw; large and widely separated permanent canines; four incisors in lower jaw. Teeth well preserved and kept. Large amount dark, venous blood in veins of neck. Moderate layer of subcutaneous fat; muscles well developed, natural color.

Peritoneum shows slight passive congestion, moist in character. Few drops of clear fluid in recto vesical pouch. Appendix long, twisted, otherwise normal. Considerable fat in omentum. Position of the abdominal organs is natural.

Lymph-glands in ligamentum gastro-colicum about the size of split peas. The glands of the mesentery are more definitely enlarged; about the size of small lima bean, light grayish red in color.

The chest wall is arched and symmetrical.

Diaphragm is attached at the level of the fifth rib on both sides. There is evidence of old adhesions between the anterior part of the right lung and sternum.

Thymus and Thyroid Glands: The thymus is attached to the anterior part of the right lung, which overlies it. It extends up in front of the trachea for a considerable distance, almost to the lower end of the thyroid gland. Dimensions 11.5 cm. by 6 cm. by 1 cm. Thyroid gland is of normal size and appearance.

Lungs: Both lungs are much inflated with air, and quite emphysematous at free margins, covering pericardium and thymus glands almost entirely. The left lung is excessively distended with air throughout. Marked cyanosis of bronchial tubes. The air does not escape as readily as usual from lung parenchyma. Posterior portions are much congested. There are no visible scars. Right pleura is entirely obliterated by easily broken adhesions. Right lung is similar to left.

Heart: There is about a tablespoonful of clear fluid in the pericardium. The left ventricle is in systole. The right is also collapsed. Heart contains small amount of fluid, dark, venous blood; no air. The pulmonary artery is filled with dark fluid blood; the blood is everywhere liquid and shows no sign of clotting. The heart-muscle on the right side thin and flabby. Left side normal thickness, pale, firm, slightly opaque. Valves normal save for a yellow spot on the large flap of the mitral. Aorta and coronaries normal.

Spleen: Normal in size; capsule wrinkled. Cut surface shows an enlargement of the Malpighian bodies, measuring about 2 mm. in diameter.

Kidneys and Adrenals: The left adrenal shows bright yellow cortex, rather small, otherwise normal. Kidney is of normal size; capsule strips easily. The cortex shows normal markings, pelvis normal. Right adrenal and kidney same as left.

Stomach: Stomach contains a large amount of partly digested food, in which there is considerable curdled milk. Mucous membrane covered with thin layer of mucous. Shows distinct of lymph follicles; numerous, the largest one 2 mm. in diameter.

Pancreas: Normal.

Gall Bladder: Contains thin usual bile, otherwise normal. Bile duct patent.

Liver: Liver normal size, and surface shows passive congestion, otherwise normal.

Genitalia: Both testes in scrotum of normal

size. Penis well developed shows marked phimosis; impossible to push gland through opening in the very long prepuce.

Intestines: Duodenum contains some turbid mucus. The small intestines contain a considerable amount turbid, bile-stained mucus. Small amount of normal soft stool in cecum. The rest of large intestines contain small amount of mucus. Some liquid stool in sigmoid flexure. Mucous membrane of jejunum slightly swollen, of light cream color, evidently due to a beginning absorption of chyle. Peyer's patches in lower small intestine slightly swollen and congested. There are many small lymph glands at the mesenteric insertion. Considerable enlargement of the lymph follicles of Peyer's patches, especially well marked in the region of the ileo-cecal valves.

Lymph follicles all through the large intestines are numerous, enlarged; largest being 3 mm. in diameter. There is a polypus about 3 mm. long by 1½ cm. in diameter in the region of the splenic flexure.

Lymph Glands: Bronchial lymph-nodes grayish red color, size of small beans; there are a few slightly enlarged lymph nodes at hilus of the spleen. Glands in the mesentery of transverse colon enlarged moderately. There are a few very large glands in the mesentery in the region of the ileo-cecal valve.

Retroperitoneal and mediastinal glands not enlarged. There are large grayish glands in both submaxilliary regions. The glands in the lower part of the neck only moderately enlarged and there is a marked enlargement of them at the base of the tongue and moderate enlargement of them in the anterior wall of the pharynx.

Tonsils: Moderate size; uvula markedly edematous. Larynx and trachea show passive congestion.

Aorta: Aorta normal.

Brain: The longitudinal sinus is normal, contains some fluid blood. The pia mater shows marked passive congestion. The large blood vessels at the base of the brain are normal. The brain substance is moist; shows passive congestion.

Diagnosis: Pathological—Status Lymphaticus.

From the above it will be noted that the enlargement of the lymph-glands throughout the body was general together with a persistent and markedly enlarge thymus gland.

The cause of the sudden death is attributed to the condition of status lymphaticus in this boy, one among thousands, and which could not stand antitoxin.

It is interesting to note that on the day previous the sister of this boy, who was the active case, had received intravenously 20,000 units of the same antitoxin and on the following day in the same manner an additional dose of 10,000 units, and made a complete recovery.

This unfortunate case has not deterred the department's use of antitoxin, either as a curative or prophylactic measure, but it has brought its lesson, which may be of value to other Health Departments, not in the prevention of death in such cases, but the avoidance of criticism.

The Board of Health now requires:

First, the written consent of parent or guardian to administer antitoxin.

Second, the Sanitary Inspector must remain with the patient or the contacts not less than one hour after its administration.

TYPHUS FEVER IN CALIFORNIA.*

By JAMES G. CUMMING, M. D.,
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Typhus, typhoid and relapsing fever were not differentiated until in Ireland in 1829 a distinction was made clinically between typhus and relapsing fever, and it was eight years later that Gerhard defined the clinical and pathological differentiation between typhus and typhoid. The discovery of the spirilium of relapsing fever by Obermeier in 1868 and the typhoid bacillus by Eberth in 1880 definitely established the etiological differentiation between these two diseases and their non-identity with typhus fever.

During early civilization typhus fever was the predominant disease; whereas typhoid was of secondary prevalence. With the advancement of civilization, however, and the adoption of higher standards of personal hygiene, typhus has receded. On the other hand, with the growth of large cities and the resulting contamination of food and water supplies, typhoid has become pandemic.

Except under war conditions, epidemics of typhus are now rare, although the disease is endemic on the Great Plateau of Mexico, in parts of Ireland, France and Russia, in Algeria, Egypt, Hungary and certain provinces of the Balkan States. As a result of war conditions the recent Servian epidemic, which for a time claimed as many as five hundred lives per day, is still fresh in our minds.

The three chief visitations of this disease to the United States were in New York in 1881 and 1882, and again in 1892 and 1893, and in Philadelphia in 1883. Sporadic cases have not been uncommon at our seaports. Furthermore, it has been recently shown that the symptom-complex known as Brill's disease is in reality typhus fever. In 1909 Dr. Nathan E. Brill reported two hundred cases of an acute infectious disease of unknown origin observed by him in the wards of the Mount Sinai Hospital. He had previously reported seventeen cases of the same disease. The important phases of the disease are summarized by Brill as follows:[1] "An acute infectious disease of unknown origin and of unknown pathology characterized by a short incubation period (four to five days), a period of continuous fever, accompanied by intense headache, apathy and prostration, and profuse and extensive erythematous maculo-papular eruption, all of about two weeks duration, whereupon the fever abruptly ceases either by crisis or by rapid lysis within three days, when all symptoms disappear."

When Brill's second paper appeared in 1910,

* Read before the Stanford Clinical Society, November 6, 1916.