to be practically obliterated by hemorrhage and there was softening of the whole substance of the cord in this region of enlargement.

On sagittal sections of the bodies of the vertebrae a comminuted fracture of the right part of the body of the fifth accompanied by a transverse fracture of the disk between the fourth and fifth were found present.

Some of the organs (lungs, kidneys, spleen, heart and aorta, piece of stomach) were submitted to Dr. William Ophitils for examination who reports as follows:

Pathologic Report.—Some irregular areas of collapse in both lower lobes; no scars of apices. Very slight pigmentation with coal dust. Aorta small, moderate hypertrophy of left ventricle (athletic). Few small slightly elevated yellow spots in aorta and on large flap of mitral valve. Hemorrhagic erosions in stomach. Marked fetal lobulation of kidneys. Marked passive congestion of spleen and kidneys. Emphysematous inflation of asthmatic lungs. Sections of lungs show hypertrophy of involuntary muscle in small bronchi. Much contracted and lumen of bronchi very narrow. Lung tissue hyperemic, air-spaces partly dilated, partly collapsed. Few areas of cellular thickening and fatty degeneration in intima of aorta; some fibrosis in media and adventitia. Kidneys show desquamation in small tubules, few hyaline glomeruli, no arteriosclerosis in larger arteries. Marked hyperemia of venous capillaries in spleen. Mucous membrane of stomach normal. Asthmatic lung, partial collapse of lung tissue, passive congestion of kidneys and spleen; beginning arteriosclerosis of aorta.

ANAPHYLAXIS AND THE TOXIC SUBSTANCE FROM VIRULENT PNEUMOCOCCI *

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From a study of the action of autolytic extracts in NaCl solution of virulent pneumococci, it has been learned that they become very toxic to normal guinea-pigs at a certain period during autolysis. Intravenous or intracardiac injections of from 3 to 7 c.c. produce symptoms and post-mortem changes in every way typical of anaphylactic shock obtained in sensitized pigs following the second injection of protein. The symptoms usually begin before the injection is completed and death occurs in from two to ten minutes. Thus far, eight strains of virulent pneumococci have yielded this highly toxic substance. Early the extracts are only slightly toxic to normal animals, but very toxic to animals sensitized with extracts of pneumococci. At the end of from twenty-four to forty-eight hours at 37 C. (especially if ether has been added) or from four to ten days in the ice-box (without ether) they are very toxic to normal animals, but only moderately or not at all to sensitized animals, while still later they become quite harmless to both normal and sensitized animals. It makes no difference whether the cocci are washed or not, whether grown in broth or on blood-agar slants. Non-virulent pneumococci, which as a rule contain little or no autolytic ferment, heated virulent pneumococci and pneumococci killed with formaldehyde solution or bichlorid of mercury fail to yield any toxic substance for normal guinea-pigs. The toxic property of extracts of virulent pneumococci is destroyed largely on heating to 60 C. for half an hour and wholly on boiling for ten minutes. Digestion with serum, with leukocytes or with trypsin at 37 C. for eighteen to ninety-six hours also destroys the toxic power. A similar toxic substance is obtained at a certain period in broth, and especially in serum broth, cultures of virulent pneumococci. Here

especially and less so in the NaCl solution extracts, the toxicity is greatest when proteolysis as determined by the formalin titration method has reached a definite point.

From consideration of the results and from a comparative study of the effect of extracts in NaCl solution and of the anaphylotoxic substance obtained by the interaction of pneumococci (antigen), immune serum (amboceptor), and normal serum (complement), and by normal serum alone on pneumococci it seems certain, first, that pneumococci, and hence probably other bacteria furnish at least a part of the anaphylotoxic substance when treated with amboceptor and complement *in vitro*, as well as *in vivo* when injected into previously sensitized animals, and second, that the symptoms in pneumococcus infections may be due to this highly toxic substance. The finding of this toxic property of extracts of pneumococci has another important bearing. Based on studies of anaphylaxis a number of investigators conclude that bacterial intoxication is possible only after certain antibodies have been formed which now attack the infecting bacteria and convert their relatively harmless bacterial proteins into highly toxic products. That this may be the case in many infections is supported by clinical observations. But in view of my results and other facts, it seems certain that at least some strains of virulent pneumococci possess all the essential properties to produce disease forthwith.

A fuller report of this study will appear in a forthcoming number of the *Journal of Infectious Diseases*.
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EMPHYSEMA OF THE SKIN OCCURRING DURING LABOR

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Emphysema of the skin is of rare occurrence, especially as a result of violent straining during labor. It has been known to occur from excessive vomiting or paroxysmal attacks of coughing, which caused a rupture of the pulmonary alveoli with the escape of air into the subcutaneous tissues. The case here reported is the only accidental complication of its kind that has occurred in the Sydenham Hospital.

The patient is a primipara, 20 years of age, a shop-worker by trade, admitted in labor into the maternity wards of Sydenham Hospital at 7 a. m., March 21, 1911. There was a three-finger dilatation of the cervix, head engaged (R. O. A.), membranes unruptured, heart sounds audible in the right lower quadrant anteriorly. A vaginal septum $\frac{1}{4}$ of an inch thick, extending from a point just below the meatus urethrae and disappearing into the fourchette, completely divided the orifice. The pelvic diameters were normal, measuring respectively, external conjugate, 20 cm.; diagonal conjugate, 10.5 cm.; interspinal, 22 cm.; intercrystal, 20 cm.; anteroposterior at the outlet, 9.5 cm.; transverse at the outlet, 7.5 cm. The temperature was normal; catheterized specimen of urine negative.

At 2 p. m. the same day the membranes ruptured, pains became more frequent and as the presenting part was dilating the vulvovaginal orifice and stretching the septum in advance of it, the patient made excessive efforts to overcome this obstruction. Spontaneously with her straining a swelling suddenly appeared on the right side of her neck and around the angle of the lower jaw, gradually covering the face on that side, distorting it and closing the eye completely. By the time the septum had been broken through and delivery of the child was accomplished, the swelling had extended to the root of the neck and upper part of the chest with a distinct line of

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