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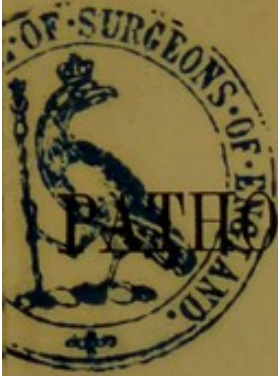
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THE



PATHOLOGY OF SCARLATINA,

AND THE RELATION BETWEEN

ENTERIC AND SCARLET FEVERS.

PRESENTED
BY THE
AUTHOR

BY

JOHN HARLEY, M.D. LOND.,

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AND LECTURER ON PHYSIOLOGY AT ST. THOMAS'S HOSPITAL.

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1872.

METHODS OF SCALING

ENTRANCE AND DEPARTURE

JOHN HANCOCK

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LONDON

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THE
PATHOLOGY OF SCARLATINA,
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THE pathology of scarlatina is so neglected a subject that no connected account of it exists in medical literature. The opinion of modern writers appears to be that the morbid anatomy of scarlatina is that common to febrile diseases. Here and there a statement with regard to a particular organ or condition may be found; but some of these statements, as may be inferred from the sequel, are not in accordance with the facts herein narrated. I propose, therefore, to give, in the first place, a description of the morbid appearances which I have observed in forty cases of scarlet fever. Of these I find that twenty-eight will be sufficient to illustrate the subject. The date of death is the only circumstance which has influenced me in the selection of these cases, my desire being to give a consecutive history

of the progress of the morbid changes from day to day. The most fatal period is from the third to the sixth day, and I have thought it desirable to use repetition in cases of death during this interval. The remaining cases, which are not recorded in this communication, agree in every particular with those adduced.

I know of no disease in which the morbid effects are more uniform, and I can truly say of all my cases "ex uno disce omnes," so invariable are the essential lesions. As will be seen from the sequel, scarlatina is essentially a disease of the lymphatic system; it is attended with inflammatory action of this system of glands, in which I include the spleen, the mesenteric glands, the tonsils, and the solitary and agminated glands of the intestines; and the essential lesions of scarlatina are those which result from this inflammatory action. Other, and it may be secondary lesions have reference to the condition of the blood and the bile.

The second part of this communication contains a record of those cases in which I have observed the primary inflammation of the intestinal, and sometimes of the other glands, pass into the ulcerative stage, and so lead to the development of enteric fever as a sequel to scarlatina.

It is to this first part of my subject, viz., the pathology of scarlet fever, that I first solicit attention. The facts are included in Cases 1 to 28, and only the necessary details are given.

CASE 1. Death on the third day of scarlatina; general inflammation of the mesenteric and Peyerian glands; psorentery.
—Elizabeth P—, æt. 22, died of delirium and diarrhœa. The scarlet rash appeared on the second day, and was copious and livid; the throat affection was severe, and the glandulæ concatenatæ of the neck swollen. A sister was ill of scarlatina at the same time, and recovered. The post-mortem examination was made a few hours after death. The right cavities of the heart were distended partly with dark fluid blood (temperature 98° Fahr.), but chiefly with large, firm, adherent, and entangled colourless clots, which passed into

the pulmonary artery and superior cava, and branched for a considerable distance within them, nearly obliterating their channels. The left ventricle contained a similar clot of moderate size, entangled with, and adherent to, the cordæ tendineæ. It was continued into the aorta, and branched into the arteries of the arch. The spleen and mesenteric glands were swollen and dark coloured. The agminated glands, as high as the duodenum, were swollen and purple; two of the larger patches, about eighteen inches from the valve, were much raised, of a blood-red colour, and appeared to be abraded. The solitary glands were swollen, prominent, and of a yellowish colour, so that the lower third of the ileum appeared as if uniformly sprinkled with grains of sago. "Psorenterie" is the term used by French writers to denote this condition. The mucous membrane of the small intestine was completely injected, and of a bright rose colour.

CASE 2. *Death on the third day of scarlatina; general inflammation of the mesenteric and intestinal glands.*—Caroline D—, æt. 6, sister to H. D— (see Case 7), died comatose. The body was well nourished, and blotched with a scarlet rash. The glands of the neck were a little swollen. Excepting the apex, the right lung was increpitant, fleshy, flabby, friable, and bound to the chest wall by old adhesions. The heart contained only soft blood clots; the gall-bladder was full of thick dark sap-green bile, neutral, sp. gr. 1032, giving with Pettenkofer's test a rich and permanent purple. 1000-gr. measures yielded, at 212° Fahr., eighty grains of almost black brittle extract of strong fatty odour. Spleen three and three quarter ounces, firm. Mesenteric glands swollen to the size of marbles, and making a heavy lobulated mass of the mesentery. The small intestine was in the same condition as that of her sister (Case 7), the agminated glands being vividly injected, and swollen from the jejunum downwards, and there was general psorentery. The mucous membrane of the colon was of a pale rose colour, and the solitary glandulæ, from the cæcum to the left bend of the colon, were enlarged, red, and prominent.

CASE 3. *Death on the fourth day of scarlatina; general inflammation of the mesenteric and Peyerian glands; psorentery.*—Emily H—, æt. 11, died comatose. There was diarrhœa on the second day. Glands of the neck enlarged. The right cavities of the heart, and the large vessels connected therewith, blocked with firm yellow clots, as in the preceding case. The gall-bladder full of pale, watery, orange-tinted bile. The spleen and mesenteric glands moderately swollen; some of the latter purple. The blood-vessels of the lower third of the ileum were completely injected, and the agminated glands of this portion of the bowel swollen and inflamed, those near the valve being furnished with cockscomb-like processes. The solitary glands were all swollen, forming white hardish eminences about the size of hemp-seeds; general psorentery.

CASE 4. *Death on the fourth day of scarlatina; general inflammation of the mesenteric and Peyerian glands; psorentery.*—John F—, æt. 5, died rather unexpectedly of oppressed breathing and failure of the heart's action. Autopsy three hours and a half after death. Skin discoloured with fine and coarse dark purple spots, almost confluent in the groins and on the sides of the body. Temperature, under the liver, 100·9° F. The right cavities of the heart contained colourless entangled clots branching into the lungs and neck. Bile abundant, watery, of a greenish-yellow tint. Spleen three ounces and a half. The mesenteric glands, and the agminated glands of the ileum, from the jejunum downwards, were purple and swollen; the solitary glands in the condition of general psorentery, and rough to the touch. The solitary glands of the large intestine were swollen and purple.

CASE 5. *Death on the fourth day of scarlatina; general inflammation of the mesenteric and Peyerian glands; psorentery.*—George B—, æt. 30, died delirious and prostrate; the body was fairly developed; the skin mottled with a lobster-red, becoming purple about the shoulders, and on the sides of the chest and loins. Heart-clots as in the previous case.

Gall-bladder collapsed, pale, and contained only a drachm of clear, watery, orange-coloured, non-alkaline bile. Spleen turgid and enlarged. Mesenteric glands turgid, many as large as French beans, generally pale. The lower part of the ileum was purple externally, pale internally. All the Peyerian glands were pale, swollen, abruptly prominent, and spongy-looking, and the whole of the solitary glands greatly enlarged, and in the condition described in the former case.

CASE 6. *Death on the fourth day of scarlatina; general inflammation of the mesenteric and intestinal glands; moderate psorentery.*—Charles S—, æt. $10\frac{1}{2}$, died of exhaustion on the fourth day of very severe scarlatina. The rash was very intense, the whole skin being of a fiery damask-red colour. The body was well nourished, and the skin discoloured with fine purple spots and blotches. The heart was not examined; the kidneys were congested; the gall-bladder contained two ounces and a quarter of dark greenish-brown bile, very slightly ropy, neutral; sp. gr. 1013·2, giving a reddish-purple colour with Pettenkofer's test 1000 grain measure yielded, at 212° Fahr., 36·4 grains of dark greenish-brown extract. Spleen four ounces and a half, almost as firm as liver. The mesenteric glands were turgid and purple, or pale, and greatly enlarged, so as to convert the mesentery into a large thickened lobulated mass, some of the glands being as large as a pigeon's egg. The lower portion of the ileum was purple, and Peyer's patches in the last six inches were greatly swollen and injected, forming cockscomb-like folds; above this they were merely swollen and spongy, as in the first stage of enteric fever. Besides this there was general psorentery, but the glands were not so much swollen as in the preceding two cases. The cæcum was severely congested, and the solitary glands of the colon were swollen and prominent, a portion being of a purple colour.

CASE 7.—*Death on the fourth day of scarlatina; general*

and severe inflammation of the mesenteric and intestinal glands.
—Henrietta D—, æt. 8, sister to C. D. (see Case 2), died of failure of the heart's action. The dead body was covered with a livid scarlet rash, and the glands of the neck were slightly swollen. The right cavities of the heart contained entangled, colourless, and soft dark clots. The bile was abundant, and had the same characters as that of her sister (see Case 2). The spleen weighed three ounces, and had a depressed white cicatrix, the size of a sixpence, on the centre of the outer surface. The mesenteric glands were much swollen, round, and purple, and the whole mesentery was completely injected, purple, and so greatly thickened as to resemble a large half-filled bag of large and small marbles. The intestines were empty; the mucous membrane of the lower third of the ileum was deeply injected, and covered with a dusky green adherent slimy ooze. The agminated and solitary glands throughout were greatly inflamed and swollen, of a purple-rose or deep claret colour, always darker than the surrounding mucous membrane, above which they were elevated one sixth of an inch. Those nearest the valve were most severely affected. The ascending and transverse portions of the colon were injected, and the glandulæ swollen and more deeply injected.

CASE 8.—*Death on the fifth day of scarlatina; general inflammation of the mesenteric and intestinal glands, with psorentery.*—Rosa B—, æt. $2\frac{1}{2}$, died of failure of the heart's action, with large buboes on either side of the neck. The dead body was covered with a dusky scarlet rash; the right cavities of the heart were distended with soft, chiefly colourless clots, which were continued into the larger vessels and their primary branches. The gall-bladder was full of greenish, watery bile. The spleen weighed two ounces and a half, and was of a firm consistence. The mesenteric glands in connection both with the large and small intestine were much swollen, some of those about the junction of the two tubes being as large as walnuts. The whole of the glands of the small intestine, from the jejunum downwards, were swollen

and prominent, the solitary glands being in the state of general psorentery (as in Case 1), giving the mucous membrane a roughly granular feeling; some of the latter were beginning to soften at the summits, and presented an abraded appearance. The agminated glands were much injected and angry looking, being raised the eighth of an inch above the pale mucous membrane surrounding them. One patch, a foot from the valve, was in a more advanced stage, and almost bleeding. The appearance of the open intestine was striking, the mucous membrane generally being everywhere naturally pale, and so bringing the red raised Peyer's patches into strong relief, and the intervals between these in the last three feet of the bowel being thickly strewn with the prominent straw-coloured solitary glandulæ.

CASE 9.—*Death on the fifth day of scarlatina; general but moderate inflammatory swelling of the mesenteric and intestinal glands.*—Walter N—, æt. 17, died delirious and prostrate. The body was well developed but spare, and the cutaneous affection had been so severe that the epidermis was abraded from the scrotum, elbows, and nates. The gall-bladder was full of ropy greenish-brown bile, muddy from epithelial *débris*. On standing it became clear, and of a pale glaucous colour, like some specimens of urine. It was neutral, of sp. gr. 1013·2. Pettenkofer's test gave the faintest brownish-purple tinge, which did not interfere with the transparency of the mixture and soon disappeared. 1000-grain measures yielded by the water-bath 31·2 grains of brittle residue of fatty odour and dingy gamboge colour. The spleen weighed twelve ounces; it was palish-purple, firm, and turgid. The mesenteric glands and mesentery generally were greatly congested, the glands being enlarged, spherical, and purple. The transverse colon contained healthy-looking fæces nearly formed; a few of its solitary glands were enlarged, and some of them purple. The mucous membrane of the ileum, excepting the last four inches, was of an uniformly dusky purple colour. There was general psorentery. Peyer's patches partook of the general and severe congestion, and were

slightly swollen. Those of the last four inches of the bowel were pale, like the mucous membrane.

CASE 10.—*Death on the fifth day of scarlatina; general inflammation of the mesenteric and ileal glands.*—Joseph S—, æt. 45, died of exhaustion. The body was finely developed, and the skin discoloured with dusky purple blotches and spots. The gall bladder was empty and contracted, the mucous lining injected and red, and moistened with a few drops of colourless, alkaline, mucous fluid. The spleen seven ounces, and soft. The mesenteric glands purple, turgid, and as large as filberts. The bowel contained a little light ochre-coloured fluffy fecal matter. The ileum was purplish externally and pale internally. The solitary glandulæ were in the state of general psorentery. Peyer's patches were not so much affected, being pale and only a little more prominent than in health, excepting, however, three within two feet from the valve, which were considerably raised and injected.

CASE 11.—*Death on the sixth day of scarlatina; general inflammation of the mesenteric and ileal glands.*—William S—, æt. 4, died from progressive failure of the heart's action. The abdomen was tympanitic before death. The body was well nourished. The right heart contained fluid blood and very firm colourless clots branching away into the great vessels. The gall bladder contained half an ounce of watery fluid, turbid from epithelial *débris*. On standing it had the appearance of pale urine. The spleen was swollen; the mesenteric glands large, turgid, and purple; the intestines were distended with air, and empty of solid matters. In the ileum there was general psorentery, and Peyer's patches were red and swollen, many raised the one eighth of an inch above the mucous membrane, with the paleness of which they were in strong contrast.

CASE 12.—*Scarlatina; death on the sixth day; severe inflammation of the mesenteric and ileal glands.*—William

C—, æt. 19, was admitted on the fourth day of a very severe attack. The rash was abundant and dusky; pulse 124, and very weak; tongue dry and brown; the throat affection moderate, and the glands of the neck only slightly swollen, and there was delirium. The skin was discoloured by a raddle-coloured patchy rash. The veins of the heart were enormously congested with very dark blood, and the *left* auricle was distended with equally dark, softly clotted blood. The left lung was collapsed, and adherent by old membranes to all parts of the chest walls. The right lung was congested; the kidneys were healthy; the spleen weighed ten ounces and a half; it was pale, and of natural consistence. The mesenteric glands were greatly enlarged, some the size of pigeons' eggs, and purple. The intestines were injected, Peyer's patches were very vascular, the turgid vessels having a whipcord appearance; the ridges were greatly swollen, producing a deep alveolation, and some ridges were raised into red tongues a quarter of an inch in length. This was the condition throughout the lower third of the ileum. A few of the solitary glands were swollen, and two of them formed bright damask-red, angry-looking elevations. The large intestine was healthy.

CASE 13. *Death on the seventh day of puerperal scarlatina; general inflammation of the mesenteric and ileal glands.*—Sarah L—, æt. 18, died the eighth day after delivery of a healthy child. Death was preceded by delirium, slight strabismus, scanty and foetid lochial discharge. The uterus weighed twenty ounces; the cavity was filled with viscid blood clot and a small portion of firmly adherent placenta. It exhaled a foetid odour. The mesenteric glands were slightly swollen. The intestines contained a moderate quantity of natural faecal matter. The mucous membrane of the ileum was pale. Peyer's patches throughout were raised above the level of the mucous membrane, their ridges were elevated and swollen, so as to give them a spongy appearance; those about the middle of the bowel were injected. The solitary

glands were more considerably swollen and many of them congested.

CASE 14. *Death on the eighth day of scarlatina; severe inflammation of the mesenteric and ileal glands.*—Francis S—, æt. 17, died in a typhous condition. The body was finely developed, the skin discoloured with a livid scarlet rash, and the epidermis separated from the parts exposed to friction, and in other parts raised into minute vesicles containing milky serum. The lungs were deeply congested, and there were points of ecchymosis on the pleural surface. Patches of ecchymosis were also present on the parietal pericardium. The right heart was enormously distended with colourless clots which branched far away into the lungs and neck. The gall-bladder was full of healthy-looking but watery bile. The spleen weighed twelve ounces, and was dark and soft. The mesenteric glands were swollen, turgid, and purple. The ileum contained some fluid, shining, dark-green, fæcal matter. The lower portion was severely congested, and there was general psorentery, and inflammatory swelling of all the Peyerian glands, some of which were prominent and almost bleeding.

CASE 15. *Death on the ninth day of scarlatina; general inflammation of the mesentery and glands of the ileum.*—Mary —, æt. 2, died of severe glandular and cellular inflammation of the neck. For some days before death deglutition was impossible from swelling of the tonsils and fauces. The deeper cervical glands and the left tonsil were in a state of suppuration; the follicular glands at the base of the tongue swollen. The spleen weighed two ounces and three quarters. The gall-bladder was injected and of a rosy tint; it contained half an ounce of watery fluid, resembling pale urine in appearance. The mesentery was everywhere greatly thickened and purple from the presence of dark, turgid, spherical glands, the average size of which was that of a hazel nut. The intestine contained some fluid fæcal matter of an ochre colour; the lower portion of the ileum

was injected and purple. Peyer's patches were all swollen and prominent; those in the upper part of the bowel, white and opaque, the inter-follicular ridges for the most part in contact and overlapping the follicles, as in the first stage of enteric fever, those in the lower portion of the ileum were beautifully injected, purple, and raised about the one eighth of an inch above the pale mucous membrane surrounding them. Just above the valve the injection was more vivid, and many of the solitary glands were swollen and ecchymosed. The large intestine was quite healthy.

CASE 16. *Death on the tenth day of scarlatina; general and severe inflammation of the mesenteric and intestinal glands.*—Jane Bradbrooke, æt. $1\frac{1}{2}$, died of exhaustion with a huge bubo on either side of the neck. The body was mottled with a dusky scarlet rash. The heart was free from clots. The liver pale, $18\frac{1}{2}$ ounces; the gall-bladder contained half an ounce of clear, watery fluid of the colour of pale urine; on a white plate it had a bright yellow tinge. Pettenkofer's test thrice applied and compared with similar testings of other bile, gave not the slightest colour reaction. 1000 grain measures yielded at 212° Fahr. 11.1 grains of brittle, bright, gamboge-yellow extract, destitute of fatty odour. The spleen weighed $3\frac{1}{4}$ ounces, and was turgid, firm, and of a dark liver colour. The whole of the mesenteric glands were greatly enlarged, being of the size of ordinary marbles, round, turgid, and purple. The intestines contained slimy mucus and one or two sulphur-coloured pellets of faecal matter. In the ileum there was general and severe psorentery, the glandulæ in the lower part being mostly white, and some of them twice and thrice the size of hemp-seeds. All the agminated glands were red, swollen, and elevated above the surrounding pale mucous membrane. This condition was as marked in the higher as in the lower parts of the ileum. A patch at the distance of four feet from the valve was abraded. The mucous membrane of the larger intestine was injected, and pink, and the solitary glands enlarged and congested.

CASE 17. *Death on the eleventh day of scarlatina; general inflammation of the mesentery and intestinal glands.*—John R—, æt. 13, died of exhaustion. The body was somewhat emaciated; the cervical glands swollen; the abdomen tympanitic. The gall-bladder was distended with clear watery fluid of the appearance of deep golden sherry by transmitted light, of an orange-yellow colour by reflected light; reaction decidedly alkaline; Pettenkofer's test gave only a faint, dull, purple colour; sp. gr. 1014; 1000 grain measures yielded 34·8 grains of brittle, deep-orange coloured extract. The spleen and mesenteric glands were swollen. The bowel contained some light ochre-coloured fæcal matter. The Peyerian glands at and just above the valve were swollen, wrinkled, and pale; the rest were injected and slightly swollen, the mucous membrane being generally pale; the solitary glands were equally swollen. There was a bloody ooze upon the mucous membrane of the middle of the ileum for the space of nine inches. The solitary glandulæ of the colon were red and moderately swollen.

CASE 18. *Death on the twelfth day of scarlatina; general inflammation of the mesenteric and ileal glands.*—Jane A—, æt. 3, died from failure of the heart's action. The rash was livid on the eleventh day, and the glands on both sides of the neck were considerably swollen. The right heart and its large vessels contained colourless clots as in the other cases. The spleen was turgid. The mesentery was purple and greatly thickened from swelling and congestion of its contained glands. In the ileum there was general and severe psorentery and every Peyerian gland was dark-red and swollen; many being raised one eighth of an inch above the pale mucous membrane surrounding them. The large intestine was healthy.

CASE 19. *Death on the thirteenth day of scarlatina; acute desquamation of the mucous membrane of the large intestine, with bloody exudation and general inflammation of the mesenteric and intestinal glands.*—Mary G—, æt. 4, died of sloughing of the left tonsil and ulcerative destruction of

the left pillars of the fauces, severe glandular inflammation on both sides of the neck, and hæmorrhage from the bowels from the eleventh to the thirteenth day. The body was well nourished; the sides of the neck occupied by large buboes. The mesenteric glands were greatly swollen; the spleen turgid; the agminated and solitary gland of the lower third of the ileum were injected and raised above the level of the surrounding mucous membrane. The large intestine contained a brownish-red, grumous fluid, and, excepting the first six inches of the ascending colon, the whole bowel from the orifice of the vermiform appendix to the rectum was greatly thickened by the formation of a bright-red villous exudation. Scarcely any portion of the mucous membrane presented a natural aspect. Lining the cæcum as far as the valve, the bloody membrane thinned away and left the next six inches of the mucous membrane of the colon bare; it then commenced again as a more wrinkled thickening of the injected mucous membrane, and increasing in development upwards attained its greatest thickness (the quarter of an inch) in the transverse and descending portions of the colon, thinning away again towards the rectum which was also lined with it. The membrane was readily detached by the edge of a knife, and the exposed surface of the bowel was then seen to be blotched and spotted with ecchymosis. The spots were circular and very numerous; some were mere points, but many were one quarter of an inch wide; all were raised and had a central depression. They were, in fact, the swollen and bleeding solitary glandulæ, and it was thus evident that these were the foci of the severe inflammatory action which had resulted in the above described exudation. This formed a thick compact membrane, for the most part blood-stained, and so wrinkled by the contractions of the bowel that its processes strongly resembled a cockscomb. It was composed of much molecular matter (coagulated fibrin), blood-corpuscles, a great quantity of well-formed columnar epithelium, numerous dark granular corpuscles varying in size from a blood-corpuscle to the $\frac{1}{1200}$ of an inch, and a few cells of squamous epithelium. In a word, the con-

stituents were those of acute desquamative colitis with exuded blood, a pathological condition completely agreeing with that which so frequently affects the kidneys in this disease.

CASE 20. *Death on the fifteenth day of scarlatina; moderate inflammation of the mesenteric and ileal glands.*—Isabella L—, æt. 12, died of diffuse suppuration of the glands and connective tissue of the neck, and purulent arthritis of the wrist, ankle, and shoulder, which came on the day before death. The mesentery was injected and the glands swollen. There was general but moderate psorentery, and Peyer's patches were injected and raised about one tenth of an inch above the paler mucous membrane. The large intestine was healthy.

CASE 21.—The brother of Charlotte B— (Case 25), a child æt. 4, was taken ill of a severe attack of scarlatina three days before his sister was affected and died on the fifteenth day. He, too, had complications of the lung, bowel and kidneys, and there was active pulmonary congestion, albuminuria, and towards the close, diarrhœa. The kidneys together weighed $12\frac{1}{2}$ ounces. There was also no affection of the solitary glands, but swelling and injection of the mesenteric and Peyerian glands.

CASE 22. *Scarlatina; death on the seventeenth day; purulent infiltration of the areolar tissue of the neck; inflammation of the mesenteric glands.*—Sarah W—, æt. 4, was admitted with a very severe attack. The rash was patchy and dusky, a sero-purulent fluid flowed from the nose and eye; there were large glandular swellings on both sides of the neck. The tongue was dry and the pulse small. She died of failure of the heart's action. The right side of the neck was raised to the level of the ramus of the jaw by a thick brawny swelling, and the deeper portion of the connective tissue was infiltrated with pus; the glands being in the same condition as in Case 23. The mesenteric glands

were as large as marbles, turgid and purple. The spleen weighed 4 ounces, it was firm and of a dark colour. The intestines were pale, and the solitary and agminated glands also pale and only very slightly raised. There was a mass of stone-coloured, soft, unhealthy fæces in the descending colon. The liver weighed 21 ounces; the gall-bladder was distended with clear, pale orange-coloured, ropy bile. The kidneys were pale, and weighed $7\frac{1}{2}$ ounces. The lungs were adherent, but free from traces of recent inflammation. The heart and great vessels were obstructed by colourless clots.

CASE 23. *Scarlatina; death on the twentieth day; purulent arthritis and nephritis; general inflammation of the mesenteric and intestinal glands.*—Helen G—, æt. 6, admitted on the third day of a severe attack of scarlatina, with a vivid rash. Pulse 120; dry tongue, and glandular swellings on each side of the neck. On the fifteenth day there was slight albuminuria and swelling with great tenderness of the left ankle and knee and the right elbow, together with purulent infiltration of the connective tissue of the neck. Henceforward she gradually sank. The glands of the neck were as large as walnuts, some pale others purple, some with softened centres and all imbedded in a purulent connective tissue. The joints above mentioned were full of yellow pus, and the glands of the popliteal space were purple and turgid, and surrounded by purulent tissue as in the neck. The tonsils and solitary glands of the tongue were purple and greatly swollen. The mesentery was greatly enlarged, as in Case 6, and many of the glands were as large as pigeons' eggs and purple, standing out on each side of the mesentery. In the ileum there was general psorentery and the agminated glands were all prominent, and swollen as in the early stage of enteric fever. Many of them were deeply injected at the centre; the mucous membrane of the ileum was pale. The solitary glands of the large intestine were so swollen and prominent as to be readily felt on passing the finger over the surface of the bowel. The spleen weighed $5\frac{1}{4}$ ounces; it was turgid and friable. The liver $35\frac{1}{2}$ ounces.

The gall-bladder was full, containing about 3 drachms of clear watery bile of the colour of dark sherry. As it flowed along a white porcelain plate, it left a deep gamboge track. Pettenkofer's test produced a good purple tinge, but the mixture had very little depth of colour. All the cavities of the heart contained white gelatinous breaking-down clots which extended far into the great vessels, and fluid chocolate-coloured blood. There was no trace of inflammatory action in the lungs. The kidneys weighed together 10 ounces, they were highly congested and the cortex was studded with bright blood points.

CASE 24. *Death on the twenty-fourth day of scarlatina; inflammatory swelling of a portion of the mesenteric and ileal glands.*—Mary V—, æt. 5, died exhausted with glandular swelling and diffuse cellulitis of the neck, and profuse fœtid discharges from the nostrils and an ear. The kidneys were quite healthy, weighing together $5\frac{1}{2}$ ounces. The liver was enlarged and fatty, weighing 27 ounces. The gall-bladder full of green ropy bile. The spleen weighed $4\frac{1}{2}$ ounces, and was naturally firm. The mesenteric glands about the lower end of the ileum were swollen and purple. The intestines contained some pellets of natural fæces. The agminated glands of the ileum were all prominent. One of the largest of them, about a foot from the valve, was uniformly injected; others above and below partially so, and contrasted strongly with the paleness of the surrounding mucous membrane. There was no ulceration of the swollen glands, but the inter-follicular ridges were vividly injected, and the turgid vessels appeared bare. The valve itself was pale but as usual thickened by the swollen glands. The large intestine was healthy throughout.

CASE 25. *Scarlatina; death on the twenty-ninth day; diarrhœa from the eleventh to the twenty-ninth day; limited pleuro-pneumonia on the seventeenth day; albuminuria on the twenty-third day; ascites and slight œdema of some parts of the areolar tissue on the twenty-seventh day; general inflam-*

mation of the mesenteric and Peyerian glands.—Charlotte B—, æt. 5, was admitted on the second day of a severe attack of scarlatina. The rash was vivid on the fourth day, and there was glandular swelling of both sides of the neck. Pulse 120. On the eleventh day the rash had nearly disappeared, the glandular swellings were larger, pulse 124, and the bowels became loose, having previously acted rather freely. On the fourteenth day the bowels were very loose, and the abdomen distended; the angles of the mouth excoriated. The diarrhœa continued profuse, and the stools were light ochre coloured and flocculent. On the seventeenth day there was a short dry cough, the respirations were 50, the pulse 124; considerable elevation of temperature, and fine crepitation at the back of the left lung. She continued to have two or three loose stools a day; the pneumonic symptoms increased in intensity, the respirations being 64 and the pulse 130 to 140 on the twenty-seventh day, when the face became a little puffy, and the albumen of the urine increased. Death was preceded by a fluttering pulse and great orthopnœa. The diarrhœa continued unchecked. The body was well nourished, the face, ankle, and labiæ slightly œdematous, the skin desquamating, and slight glandular enlargement of the neck. There was half a pint of clear serum in the pleural cavities and about a pint in the abdominal cavity. The kidneys were pale and enlarged, weighing together $11\frac{1}{2}$ ounces, the cortical portion severely congested. The heart contained the usual firm entangled clots, branching for a considerable distance into the great vessels. The upper lobe of the left lung was covered with a layer of recent lymph, and it was in a state of simple pneumonic hepatization. The liver was severely congested and weighed $37\frac{1}{2}$ ounces; the bile was pale and watery; the spleen three ounces, firm; the mesenteric glands greatly enlarged, turgid and spherical; those about the junction of the intestines as large as a pigeon's egg. The whole mesentery formed a heavy lobulated mass. The intestines contained a small quantity of bright orange-coloured flocculent fœcal matter. The small intestine was pink from vascular injection, and the mucous membrane was covered with a thick adherent

layer of opaque white mucus. Some parts of the mucous membrane were vividly injected. Peyer's patches alone were much swollen, and for the most part pale. Some of the inter-follicular ridges were one eighth of an inch wide. One of the smaller glands appeared as if cicatrized at the centre.

CASE 26. *Death on the thirty-third day from the accession of scarlatina; swelling of the spleen and mesenteric glands, &c.*—Fanny L—, æt. 19, died of rheumatic fever and pericarditis, which supervened during convalescence from scarlatina. There was extreme orthopnœa during the two days preceding death. The pericardium was completely adherent. The heart greatly enlarged, weighing 16 ounces alone. There were large fibrinous clots in both ventricles, and a firm black clot in the right auricle. Kidneys slightly enlarged and fatty. The spleen weighed 10 ounces. The mesenteric glands were about twice their natural size and rather flabby. The intestinal glandulæ healthy.

CASE 27. *Death on the forty-first day from the accession of scarlatina; persistent enlargement of the spleen and mesenteric glands; disease of the kidneys.*—Harriet P—, æt. 17, died of exhaustion with albuminuria after a very severe attack of scarlet fever, during which, from the tenth to the fifteenth day, there had been diarrhœa. The liver was pale and fatty; the bile normal. The kidneys enlarged and pale, the right weighed $7\frac{1}{2}$ ounces, the left 7 ounces. The spleen weighed 10 ounces. The mesenteric glands were considerably enlarged, rose-coloured above, purple near the cæcum. The lower end of the ileum was injected and purple; a spot of ecchymosis in the mucous membrane existed just above the valve. The intestinal glands were healthy. The mucous membrane of the cæcum was injected.

CASE 28. *Death on the sixty-ninth day from the accession of scarlatina; slight tumidity of the mesenteric glands and Peyer's patches, congestion of the cæcum, disease of the kidneys.*—Harriet B—, æt. 19, died of pulmonary embolism and

albuminuria. The right cavities of the heart and the pulmonary artery and its branches were obstructed by a firm white clot; there was limited pericarditis. Liver fatty, 54 ounces; gall-bladder contained an ounce of healthy bile. Kidneys large, severely congested and the tubes stuffed with epithelial débris; the right weighed 10 ounces, the left $8\frac{1}{2}$. Spleen $6\frac{1}{2}$ ounces, normal in appearance. There was slight tumidity of the mesenteric glands and of Peyer's patches in the neighbourhood of the ileo-cæcal valve. The cæcum was severely congested, and there was extravasation of blood into the submucous tissue.

Upon analysis of the foregoing twenty-eight cases, it appears that the greater number died on days ranging consecutively from the third to the fifteenth day, and that the remainder died on the seventeenth, twentieth, twenty-ninth, thirty-third, forty-first and sixty-ninth days. More or less albuminoid or fatty degeneration of the kidneys existed in six cases, and in these death occurred on the fifteenth, seventeenth, twentieth, twenty-ninth, forty-first, and sixty-ninth days respectively. In the rest these organs were healthy. The pathological changes common, with a few exceptions (depending upon the time of the disease), to all, are as follows:

1. *The formation of fibrinous clots in the heart and great vessels during a pyrexial state, at any period of the disease.*—This is the commonest cause of death during the early stage of scarlatina, it is indicated during life by the reduction often sudden, of a full pulse of about 120, to a dribble of 150 or 160 almost imperceptible impulses. The failure of the heart's action is commonly attended with orthopnœa and delirium from obstruction to the pulmonary and cerebral circulations. On opening the body before it has lost a degree of temperature, and while the hot blood is still fluid, the right heart will be found distended, partly with dark fluid blood which coagulates on exposure; and partly, sometimes chiefly by a large, firm, white, bifid clot continuous through the auriculo-ventricular openings. Each portion is interlaced with, and firmly adherent to the tendinous cords and out-

standing muscular bands of the cavity in which it lies, and sends outwards a rope-like continuation, the one into the pulmonary artery, and the other into the superior cava. These processes not only occupy a large portion of the area of these tubes, but branch with their branches upwards, into the cranial cavity and outwards into the lungs, whence they may often be withdrawn in ramifications up to the eighth degree, and eight or nine inches long.

The left heart was generally empty and firmly contracted ; in one case (1) each cavity was occupied by a large fibrinous clot, that in the ventricle spreading into the brachio-cephalic vessels of the arch of the aorta, and that in the auricle sending large ramifying branches into the pulmonary veins. In another case (12) the auricle was distended with dark softly clotted blood.

In Case 26 there were fibrinous clots on both sides of the heart, but there was pericarditis in this case.

2. *Marked derangement of the hepatic function.*—The bile was examined in twenty cases. In five only were the characters of the secretion normal, and in these cases death occurred on the third, fourth, twenty-fourth, and sixty-ninth days respectively—periods probably too early in the two former cases for the development, and in the two latter too late for the persistence, of any notable derangement of the bile.

In the remaining fifteen cases the bile was in a very deteriorated condition. In two patients (Cases 10 and 15) there were evidences of decided inflammation of the gall-bladder, the viscus being injected and the mucous membrane rose-coloured ; and in one of these cases (10) there was a complete absence of bile, the mucous membrane being merely moistened with a few drops of a colourless alkaline fluid. In three other cases the bile had a natural greenish-brown colour, but it was greatly deficient, like that of the remaining ten cases, in solid matters, the specific gravity in not one of the thirteen cases exceeding 1014, and the amount of solid matter not more than 36·4 grains, in 1000 grain measures of the secretion, being less than one third of the normal amount. In one case (16) 1000 grain measures yielded only 11·1 grains

of solid matter. In the majority of the cases the bile was turbid from epithelial débris, but on settling it became clear and transparent, and resembled pale urine. In all the thirteen cases there was a notable deficiency in the biliary acids; in one case (16) this was complete, and in three others (6, 9, and 17) nearly complete, Pettenkofer's test indicating, upon several trials, a mere trace. The colouring matter was never absent, and the thin bile always left a more or less bright-gamboge-coloured track after flowing over a white surface. The intestinal contents agreed with this condition of the bile. If, as rarely happened, the bowel contained solid fæces, they were in some cases of a pale ochre or sulphur colour. The fæcal matters, however, were generally fluid, grumous, or flocculent, often stringy, and of a pale ochre colour. Such also were the characters of the stools before death in many of the cases.

3. *General inflammation of the lymphatic system of glands.* This, as far as *the ordinary lymphatic glands* are concerned, was usually confined to those of the head and neck; but in two cases (20 and 22) those of the extremities were affected, in connection with suppurative arthritis. The cervical glands were swollen in every case, in some slightly, in several severely; and in the two cases just quoted, to the formation of huge suppurating buboes. The suppurative action, however, affected the connective tissue more than the glands, which were for the most part purple and enlarged to the size of marbles or walnuts, only a few of them, in the worst cases, having softened and purulent centres.

The tonsils and solitary glands of the tongue were generally affected in every case.

The spleen.—Was not noted in one case. In four cases (death at the fourth, fifth, twenty-ninth, and sixty-ninth day) the gland was not enlarged. In the remaining twenty-three cases it was swollen; and in five of these (ninth, twelfth, fourteenth, twenty-fifth, and twenty-sixth) it weighed from ten to twelve ounces. In young children the texture was firm, in adults it was sometimes of normal consistence and sometimes soft.

The mesenteric glands were generally and severely inflamed

in every case, the whole mesentery being thickened, and the glands purple and swollen, in some cases to the size of a pigeon's egg. Even the small glands in the attached borders of the transverse and descending mesocola were often found turgid and purple.

The solitary glands of the ileum were in the condition known as "psorentery," *i. e.* forming white granular or papular, solid-feeling elevations, giving to the mucous membrane the appearance of being thickly sprinkled with grains of sago in fourteen cases. In others the solitary glands were only partially affected, the swelling being usually softer and more diffuse in these cases, and the glandulæ deeply injected, some occasionally had an abraded appearance. In three cases, in which death occurred on the eleventh, seventeenth, and sixty-ninth days, there was only very slight swelling of a few of the glandulæ; and in the four remaining cases in which death happened on the fifteenth, twenty-fourth, twenty-ninth and thirty-third days respectively, these glands were altogether unaffected.

The solitary glands of the large intestine were enlarged and inflamed in Cases 4, 6, 7, 9, 16, 17, 19, and 23. In one of these (19) there was acute desquamation of the mucous membrane of nearly the whole of the large intestine. In another case (28) the cæcum was severely congested. In those of the remaining cases (about one half) in which the large intestine was examined, the mucous membrane and its contained glandulæ were quite healthy.

The agminated glands were more or less swollen and inflamed in every case but one (26), that in which death occurred on the thirty-third day. In Case 22 (death on the seventeenth day, from suppuration of the cellular tissue and glands of the neck) there was only slight swelling. In the other cases the inflammation was decided and in many severe.

The glands were commonly raised one-eighth of an inch above the surrounding mucous membrane, than which they were always more deeply injected, and in the greater number of cases the difference was very striking, the mucous membrane

generally being pale, and the swollen glands of a vivid red or claret colour.

The inflammatory action was usually confined to the glands in the lower third of the ileum, but in four or five cases the whole of the patches from the jejunum downwards were affected. The inter-follicular ridges were often one-eighth of an inch wide, giving to the paler glands a spongy appearance; but the ridges were more often vascular, and fine hairlike turgid vessels were occasionally very conspicuous. In some cases the vascular ridges were prolonged into folds a quarter of an inch in length (see Cases 3, 6, 7, and 12, in which death took place on the fourth and sixth days). In some of the larger glands isolated foci of inflammatory action were occasionally seen and sometimes the whole gland was in an almost bleeding state and appeared softened and abraded.

The general mucous surface of the ileum was severely inflamed in a few of the cases (1, 7, 8, 9, &c.). In some others it was covered over by a thick adhesive layer of opaque white or slimy mucus, the membrane itself being severely injected (see Cases 7 and 25).

If we now take the pathological conditions into one general view it will appear that *febris lymphatica is the appropriate scientific definition of scarlatina*; that death is very likely to occur during the first week of the disease from the formation of fibrinous clots in the heart and great vessels; that the condition of the biliary function is such as to lead to an outbreak of diarrhœa; that mesenteritis, and enteritis sometimes general but usually confined to the solitary and agminated glands, exist from the third day and onwards during an attack of scarlet fever, both being at their acme during the height of the fever, *i. e.* from the third to the seventh day; that the enteritis is usually latent, but ready to declare its presence upon slight provocation; and that this inflammatory condition of the mesenteric and intestinal glands may persist to the sixty-ninth day (see Case 28).

From this view *one general conclusion as to the connection of scarlet fever and enteric fever is inevitable, viz., that the pathological changes accompanying an attack of scarlatina*

include all those of the first stage of enteric fever, and are so far identical with them. And it follows therefore that the transition from the former disease to the latter is nothing more than a natural pathological sequence, readily determined by any cause which may increase the intestinal irritation.

Having arrived at this point of the inquiry, I now proceed to show that this transition is, under circumstances even favorable for its prevention, no uncommon event; that it is often very insidious in its progress, and complete in its results.

CASE 29. Scarlatina; convalescence on the thirteenth day; relapse during sojourn in the hospital with scarlet rash on the twenty-eighth day; fully developed enteric fever on the thirty-second day; convalescence on the fiftieth day. — George W—, æt. 30, was sent into the London Fever Hospital by a distinguished authority on scarlet and enteric fevers as a case of scarlatina, on the 23rd of July, 1869.

This was the second day of the disease. The rash was well developed and the throat was sore and congested; the pulse was 120. The tongue moist, and its papillæ prominent. The bowels had not been open for two days. He was ordered a dose of house mixture, and chlorine draught.

On the fourth day the rash was still present, the pulse 72. Tongue moist and furred. There was some desire for food, and fish diet was ordered.

On the sixth day the bowels were confined, and two compound rhubarb pills were prescribed.

On the twelfth day the pulse was 60, tongue moist and cleaner, the rash faded and the skin cool and rough, the throat nearly well; the bowels acting naturally.

Next day he was ordered full diet. He continued well, with rather a defective appetite, but regular action of the bowels, up to the twenty-eighth day, when, without any apparent cause, he suffered a severe relapse of pyrexia, pulse 132, with headache, anorexia, vomiting, the eruption of a general scarlet rash, and sore throat with redness and swell-

ing of the fauces. In the evening the pulse was 122, the temperature $103\cdot8^{\circ}$.

Next day 104, temperature 103° ; the thirtieth 106 and 105° .

On the thirty-first day 100 and $103\cdot8^{\circ}$; the above-mentioned symptoms continued, the vomiting had not been completely checked, and to-day purging set in, the stools being very frequent, watery and greenish.

On the thirty-second day there were three loose stools, two rose papules on the abdomen, and tenderness and gurgling in the right iliac fossa.

On the thirty-third day there were three watery light coloured stools, and twenty fresh bright rose papules on the abdomen. The vomiting had ceased and the pyrexia had slightly declined.

On the thirty-fourth day, pulse 100, temperature $100\cdot6^{\circ}$, four loose stools, numerous fresh spots, vomited thrice.

On the thirty-fifth day fresh spots continued to appear, and the rash was very bright, diarrhœa moderate, vomiting ceased.

On the thirty-seventh day there was decided improvement; the bowels continued to act three or four times in twenty-four hours, and the stools were characteristic of enteric fever; the abdomen and chest were freely spotted with old and new papules. During the next week the diarrhœa partially declined, convalescence began on the forty-fifth day, and the patient left the hospital well on the sixtieth day. During the latter part of the time he was under Dr. Murchison's care.

CASE 30. *Scarlatina; convalescence on the nineteenth day; sojourn in the convalescent ward till the thirty-first day, when there was a relapse of pyrexia; on the next day diarrhœa, and during the following nine days fully developed enteric fever, with some peritonitis; convalescence on the sixty-fourth day.*—Amy A—, æt. 14, was taken ill with rigors, sore throat, and pain in the back, and on the following day the scarlet rash appeared. She was admitted into the London

Fever Hospital on the fourth day, when the pulse was 120, the fauces and tonsils moderately swollen and congested, the conjunctivæ injected, and the body covered with a well-developed scarlet rash.

5th day.—Pulse 130, rash, dark and patchy. From this date the pyrexia declined. Desquamation began on the ninth day, and the bowels continued to act naturally. On the tenth day she took fish, and was ordered full diet on the nineteenth day. The appetite, however, continued defective, and for some days preceeding the thirty-first she did not eat the whole of her dinner. On the thirty-first day there was complete anorexia, and next day she complained of pain in the belly and had two relaxed yellow stools. In the afternoon the abdomen was full and tender, the pulse 130, and the tongue moist and covered with a white fur, and the skin rough, dry, and hot.

During the next nine days, she suffered from fully developed enteric fever, the abdomen being tympanitic, and extremely tender, the bowels acting three or four times a day, and the stools copious, liquid, containing yellow mucous flocculi, and of a pale ochre colour; the cheeks deeply flushed, the tongue dry, with a white hairy fur on the dorsum, and red tip and edges; the pulse ranging from 134 to 120, and the temperature between 105° and 100° Fahr. On the forty-second day she began to improve, and on the forty-fifth the pulse was 124, and of better power; the tongue moist and almost clean; the abdomen free from distension, and only slightly tender to the touch; a softer cooler skin, and one soft stool in the day. The improvement continued, and, excepting a recurrence of diarrhœa on the fifty-second day, she progressively though slowly convalesced. She left her bed on the sixty-fourth day, and was discharged well and hearty on the one hundred and tenth.

CASE 31. *Scarlatina; convalescence on the thirteenth day; discharge from the hospital on the twenty-third day; super-vention of enteric symptoms on the thirty-seventh day; re-admission in a typhous condition, suffering from enteric fever on*

the fifty-eighth day ; convalescence on the eighty-first day.— Rebecca K—, æt. 26, had a characteristic attack of scarlatina in the London Fever Hospital. On *the eighth day*, the rash had not entirely disappeared, and the throat was still red and slightly swollen. She resumed ordinary diet on the thirteenth day, and left the hospital apparently quite well on the twenty-third day. The bowels had acted naturally throughout. She was readmitted and again came under my care thirty-five days afterwards (*the fifty-eighth day*). On inquiry it was found that she had lost appetite shortly after leaving the hospital, and that for the three weeks previous to her readmission, that is, from about the thirty-seventh day, she had been in bed suffering from fever and diarrhœa, and had been gradually getting worse. Her condition was indeed critical ; she was delirious, with a fluttering pulse of 144, a dry brown shriveled tongue, and there was sordes on the teeth. The pupils were dilated, the face pale, with a circumscribed dusky flush on either cheek, the abdomen full, tender, gurgling on pressure, and marked with numerous rose papules, and there were frequent pale ochre-coloured, flocculent stools. The thick cuticle of the soles of the feet was separating. Fresh spots continued to appear during the next three days, and the pulse continued very high. The diarrhœa, which had been excessive, was soon completely checked, otherwise she continued in the same critical state until the sixty-ninth day, when an eruption of sudamina over the chest and abdomen, the reappearance of moisture in the mouth, and a diminution of temperature indicated an improvement. The pulse was 120. Next day the sordes began to clear away, there was slight epistaxis, and the pulse was reduced to 112. The bowels were now constipated. On the seventy-eighth day the bowels acted naturally, and the motion was formed ; pulse 104 ; tongue moist but furred ; appetite returning. Henceforward she slowly convalesced, the bowels continuing sluggish. She had fish diet on the eighty-first day. She left her bed on the ninety-seventh, and was discharged well on the one hundred and twelfth day from

the accession of the scarlet fever, and the seventy-fifth from the commencement of the enteric.

CASE 31. *Severe attack of scarlatina; convalescence on the twenty-seventh day; slight relapse with a trace of albumen in the urine on the thirty-second day; a second renewal of pyrexia on the forty-first day; diarrhœa and pneumonia on the forty-third; continuance of the symptoms; hæmorrhage from the bowels on the forty-seventh and fifty-first day, when she died.*—Sophia N—, æt. 12, was admitted on the second day of a severe attack of scarlet fever. Pulse 140, great prostration, sordes, and a general scarlet rash. The rash persisted for six days and was followed by free desquamation. On the ninth day the glands at the right angle of the jaw began to swell, abscess formed, and pus was evacuated by three successive incisions, a free discharge continuing for twenty days. There was also slight swelling of the glands on the left side of the neck, and for some days ashy mucous ulcers of the tongue. During the first week the bowels were constipated, and one or two doses of house medicine were required; during the fifteenth and sixteenth days there was diarrhœa. The fever continued high until the twenty-second day, the pulse ranging from 128 to 140. From this time she began to improve. On the twenty-fifth day she enjoyed fish diet, and was soon afterwards allowed full diet. Her appetite was moderate and the bowels were rather sluggish. On the thirty-second day the temperature rose 2° , and there was a trace of albumen in the urine. This disappeared by the forty-first day. On the evening of this day there was a renewal of the pyrexia with nausea and vomiting. On the forty-third day, pneumonia of the right lung was declared, and the bowels were very loose. The pneumonia increased, and the diarrhœa continued, accompanied by moderate hæmorrhage from the bowel on the forty-seventh and again on the fifty-first day, when she died, the event being chiefly determined by the pulmonary mischief. No post-mortem examination was made.

CASE 32. *Scarlatina; convalescence on the twentieth day; discharge on the thirty-first day; readmission with fully developed enteric fever on the fifty-sixth day; death, ulceration of Peyer's patches.*—Rebeca S—, æt. 22, was admitted into the London Fever Hospital during the decline of a moderate attack of scarlatina. On the twelfth day, the pulse was 112; the tongue red, and dryish at the centre; the fauces still red and swollen; the rash, which had been general and conspicuous, faded; and the skin desquamating. On the fourteenth day, pulse 96; tongue as before. On the sixteenth day, improvement continued; fish diet. Excepting that the appetite continued somewhat defective, she convalesced without interruption, and was discharged apparently well on the thirty-first day. The bowels had acted regularly throughout the attack. She was readmitted under the care of my colleague, Dr. Broadbent, on the fifty-sixth, suffering from enteric fever and having the characteristic rose rash. She stated that she took to her bed the day after she left the hospital (the thirty-second), feeling weak and having no appetite, and that she had not left it since. On the forty-eighth day, diarrhœa came on, and had continued ever since. On admission she had the characteristic symptoms of fully developed enteric fever, including distinct rose papules. The rash continued to appear until the sixtieth day, the diarrhœa of loose, light coloured stools persisted; the urine was albuminous, and she sank on the sixty-fourth day. The post-mortem examination revealed the characteristic lesions of scarlet and enteric fevers. The kidneys weighed each nine ounces, and were soft and congested. The spleen, thirteen ounces, was friable; and there was extensive ulceration of Peyer's patches, and the solitary glands. I am indebted to Dr. Broadbent for this account of the enteric attack and its result.

CASE 33. *Moderate attack of scarlatina; convalescence established, and resumption of solid food on the twelfth day; sojourn in the convalescent ward until the twenty-seventh day, when a relapse of pyrexia occurred; symptoms of enteric fever on the thirty-second day. Full development of the same on the*

thirty-ninth day; pneumonia and persistence of the enteric symptoms on the forty-sixth day; death on the fiftieth day; ulceration of the solitary and agminated glands of the intestines.—Jane M—, æt. 11, was admitted into the London Fever Hospital on the second day of an attack of scarlet fever of ordinary severity. The rash was well developed and the fauces and tonsils were congested and swollen, the cervical glands slightly swollen, the pulse 100. The rash and sore throat persisted on the eighth day. On the twelfth she was convalescent. On the twenty-seventh day she was ordered to bed on low diet, on account of a slight relapse of pyrexia with anorexia. Up to the thirty-second day there were no particular symptoms, the bowels had continued to act naturally, and the tongue was commonly moist and coated, the pulse and temperature under 100. On this day, however, there was an increase of the pyrexia, and the child became flushed and stupid, the skin pungently hot, the pulse 108. From this time the bowels gradually became irregular and the stools loose. On the thirty-ninth day, there were four dark yellow watery stools, a full and tender abdomen, and two obscure rose spots, a dusky circumscribed flush on each cheek, a hot, dry, harsh and still desquamating skin, pulse 116, a clean red tongue inclined to become dry and to fissure in the centre. The mind was dull and the body rapidly emaciating. On the forty-first day she lay in the same state, the abdomen a little more tense, the tongue dry and wrinkled, the angles of the mouth and orifices of the nares excoriated and bleeding, diarrhœa moderate, and the stools characteristic of enteric fever.

On the forty-sixth day, the pulse rose to 120, and symptoms of pneumonia appeared. On the forty-eighth day, there was marked consolidation of the lower portion of the right lung, and the respirations were 34. The diarrhœa continued, and the patient died on the fiftieth day from the accession of the scarlatina.

The body was greatly emaciated, a large gland overlaid the right mastoid process, and there was a chain of enlarged glands on the left side of the neck. The left pleura were

healthy, but there was a patch of hardened fleshy lung, which sank in water, about two inches across in both the upper and lower lobe of the lung of this side. There was pleuropneumonia of the right side, and the lower lobe was in a state of red hepatization and sank in water. The right cavities of the heart, the cavæ and pulmonary artery, and their primary branches were obstructed by firm colourless clots; the liver pale and fatty, forty-nine ounces: the gall bladder full of watery grumous, pale orange-coloured bile, bright and clear on standing, feebly alkaline, sp. gr. 1012.5. Pettenkofer's test gave only a faint, dirty purplish-brown tinge; 1000 gr. measures yielded, at 212° Fahr., nineteen grains of brittle yellow extract; the kidneys were healthy, weighing together nine and a half ounces; the spleen, five ounces, was firm and flabby; the mesenteric glands enlarged, flabby, and of a chocolate-brown colour; the intestines were moderately distended with air, and contained soft pale ochre coloured masses of fæcal matter; the mucous membrane of the small intestines was moderately injected. The last two feet of the ileum was the seat of twenty rounded ulcers, varying from a quarter to three quarters of an inch across. The ulcers occupied the sites of the agminated glands, and the large Peyer's patch, which is placed about two inches above the valve, contained within its area four of these ulcers; they were generally pale and smooth, and the edges even and rounded. The edges of a few were thicker, very vascular and angry-looking. Some of the ulcers lay so near the peritoneal coat that their situation was marked externally by a vascular area. All were in process of healing, and three or four Peyer's patches presented a smooth, injected, rose-coloured cicatrix effacing a considerable portion of the glandular structure. The mucous membrane of the large intestine was considerably injected, and the solitary glandulæ of the transverse colon were swollen, and many of these ulcerated, the ulcers ranging in size from a slight abrasion of the central depression of the gland, to half an inch across the widest part. The edges of these ulcers were slightly raised; some were dark and vascular, others had an ashy appearance. The glandulæ

of the other portion of the large intestine were swollen, and of a darker colour than the mucous membrane surrounding them.

Having now traced the relation which subsists between scarlatina and enteric fever to its extreme results, I will, with the view of giving more completeness to my account, narrate a few instances in which symptoms of the two diseases coexisted. And, as an appropriate introduction to these examples, I will briefly indicate the points where the outward symptoms of the two diseases meet and overlap one another. In the early stages of scarlatina and enteric fever the bowels are usually confined; in the latter stage of scarlatina they are occasionally loose, and the stools have the same character as those of enteric fever. Rose papules are not to be observed in many cases of enteric fever; and they may, if carefully sought for, be occasionally found in scarlatina. But such papulæ as usually occur in enteric fever—I mean the few, often indistinct rose spots which mark the pallid skin, and which we may properly regard as diagnostic of the disease—such papulæ, I say, can hardly, or not at all, be discovered amongst the rough and vivid rash of scarlatina. It is only, therefore, when the rose papules are very distinct and well developed that we can expect to distinguish them positively in scarlatina; yet this may be done in no inconsiderable number of cases. But if the scarlet rash be fading, as is usually the case when the papulæ appear, then they are sufficiently distinct; and if we should see the patient for the first time at this stage of the disease, and particularly if the bowels happen to be loose, we should conclude that he was suffering from enteric fever, and such would surely be the correct diagnosis; but we must not, on that account, ignore the fact that a few days before, the disease was well marked scarlatina. A large number of cases of enteric fever may thus be traced back to their origin in scarlatina; and it is as incorrect as it is unscientific to divide the train of outward symptoms which constitute the phases of one morbid condition into two sets indicative respectively of two specifically distinct diseases—so regarded. All such classification puts an artificial line of demarcation where no

real limit exists, and, for a time at least, effectually bars the advance of truth.

Excepting perhaps the flushed cheek, the mark of persistent abdominal irritation, there is no feature of enteric fever, which may not be observed in many cases of scarlatina; and conversely, a large number of patients who come under our notice for the first time suffering from enteric fever, will present the pallid face, the excoriated nostrils, the large red lingual papillæ and tonsils, the moniliform glands, and, occasionally, the aural discharge of a declining attack of scarlatina.

Again, some albuminuria is a common associate of scarlatina, but it may occur at any period of an attack of enteric fever. The urine of one of my patients who died of frightful sloughing of Peyer's patches on the 20th day, was loaded with albumen for four successive days before her death; and at page 571, vol. 1, of 'Reynolds' System of Medicine,' I have given the history of another case in which albuminuria and general anasarca immediately followed an attack of enteric fever.

To proceed with examples of the concurrence or inter-currence of scarlet and enteric fevers:—

CASE 34. *Mixed scarlet and enteric fevers; convalescence on the thirty-fifth day.*—Betsy D—, æt. 24, was taken ill with rigors, headache, and sore throat. A well-developed scarlet rash appeared on the second day, when she was admitted into the hospital.

3rd day.—P. 120; skin hot, and covered with a moderate typical scarlet rash; tongue moist, with a yellow fur.

4th day.—P. 124; tongue dryish; still a general scarlet rash with a copious eruption of distinct rose papules over the chest and abdomen; bowels sluggish; ordered ℞ss Olei Ricini cum ℥x Tr. Opii.

5th day.—Pyrexia increased; tongue dry; delirium; one costive stool.

6th day.—P. 120; tongue dry; quiet delirious; no action of the bowels. The oil and opium were repeated.

7th day.—The general scarlet and papular rose rashes persisted; the oil acted twice.

8th day.—P. 108; scarlet rash paler; the rose papules continued of a bright colour; two natural stools.

9th day.—P. 108; tongue parched; cheeks flushed.

10th day.—Delirium continued; bowels confined; slight bronchitis.

During the next five days the rash disappeared, the cough became troublesome, with frothy expectoration, the bowels acted regularly without medicine, the pulse ranged from 120 to 100, and there was a general improvement, the expression becoming more lively and the intellect clear.

From the fifteenth to the twenty-fifth day the bowels were occasionally loose, and solid food, for which she had a desire, provoked diarrhœa. A small slough formed on the nates, otherwise she progressed favorably.

On the thirtieth day she was able to take fish, and thenceforward she convalesced without any drawback.

CASE 35. *Mixed scarlet and enteric fevers; convalescence on the twenty-eighth day.*—Harriet B—, æt. 21, one of a family in which several children were ill of scarlatina. Her illness commenced with rigors, sore throat, and general scarlet rash.

She was admitted on the fourth day, when the pulse was 120, the skin moist and covered with a faint scarlet rash; the tonsils and fauces congested and swollen.

On the fifth day the skin was perspiring and the rash gone; the tongue moist with a silvery fur; the bowels as yet acting quite naturally.

On the evening of the sixth day she had three loose ochre-coloured stools, and there was slight delirium.

On the eighth day the diarrhœa had ceased; pulse 104; the tongue moist, with elevated papillæ.

On the eleventh day the bowels were again loose, and there was slight sordes on the teeth; pulse 100.

On the thirteenth day continuance of the diarrhœa; abdomen a little full and tympanitic; a single rose papule.

Pulse 108 ; tongue brown, parched ; cheeks flushed ; a little dry cough ; in a word, the typical appearance and symptoms of enteric fever.

The diarrhœa decreased, and the condition of the patient improved, and on the twentieth day there was but one lax motion in the day ; pulse 100 ; tongue moist, and rather red, with a scattered white fur.

She had fish on the twenty-third day, a chop on the twenty-eighth day, and thenceforward convalesced rapidly.

CASE 36. *Mixed scarlet and enteric fevers ; convalescence on the forty-fifth day.*—Sophia A—, æt. 26, engaged as night nurse in one of the scarlet-fever wards of the London Fever Hospital.

After ailing for three days was taken with rigors, sore throat, and the eruption of a scarlet rash and general pains ; pulse 132 ; tongue moist, and slightly coated.

During the next four days the throat continued slightly swollen and sore, the bowels remained constipated, and she had two doses of house medicine ; the pulse ranged from 128 to 116.

On the ninth day the cheeks were deeply flushed, and the bowels became loose, and in the evening there were five distinct rose papules on the abdomen : pulse 120.

The diarrhœa and a copious eruption of rose papules continued until the twenty-first day, and she became reduced to a critical condition, the pulse ranging from 120 to 130.

On the twenty-second day the pulse was 132, and there were sordes on the teeth, and a dry brown tongue.

On the twenty-fifth day the stools were improved ; the pulse was 120, and stronger.

From this time she gradually improved, and was convalescent on the forty-fifth day.

The intercurrence and sequence of scarlet and enteric fevers has been noted by several authors, and attributed to accidental coincidence. I believe that I have now adduced sufficient evidence to satisfy an unprejudiced mind that it is

due to a most intimate pathological relationship; in a word, that the pathology of scarlatina is precisely that of the first stage of enteric fever. In my article on "Enteric Fever," in Reynold's 'System of Medicine,' I have already expressed my convictions on this matter, and so strong were they at the time that work was publishing that I find I have in the proof sheet applied the term "Abdominal Scarlatina" to the contagious variety of enteric fever. I abandoned the use of the term at that time because it seemed to me that the evidence which I had adduced to show the connection implied by it was insufficient to convince those whose opportunities for examining the question in detail are rare, and whose scholastic principles would be shocked by such confusion of two diseases so universally regarded as specifically distinct. Now, however, that I am enabled to lay before the Society the full and complete evidence contained in the foregoing observations I will submit this term "Abdominal Scarlatina" to the profession as the appropriate definition of a disease which every intelligent practitioner will sooner or later meet with. Nor will I allow the opportunity to slip me, but in the interests of truth, as opposed to dogmas worthy of the dark ages, will ask my fellow labourers to go one step further with me, and discarding those transcendental ideas of enteric fever which make of it a specific disease dependent on one particular poison, open their minds to receive what experience will then soon teach them—that enteric fever, and all its attendant phenomena, may occasionally become a part of almost any other general inflammatory condition, specific or simple.

In conclusion, I desire to record my obligations to Dr. William Henderson, the resident medical officer of the London Fever Hospital, in charge of my cases, for the ready and efficient help which he has given me in the wards and mortuary in following out my observations on the foregoing cases.