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With the compliments of the author.

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TWO CASES OF UNCLASSIFIED INFECTION.

By W. F. ARNOLD, M.D., Passed Assistant Surgeon, U. S. N.

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On March 11, 1894, I attended an autopsy at the request of Surgeon John W. Ross, U. S. N., the medical officer who had had charge of the patient; but as I had no intimation as to the nature of the illness of the deceased, and as the time and place were not favorable to this end, the autopsy was not a complete one, and the records that were made beside the table were not all preserved. The weights, for instance, of the various organs removed do not appear; but my impressions, confirmed by some of those present, are against any striking abnormalities in this direction.

The following account will embrace the material contents of the official records of the case, supplemented by the observations which its unusual features led me to make:

Rigor mortis was characteristically developed at the time of the autopsy, nearly 38 hours after death. There was much hypostatic congestion, giving a very deep, slaty-blue color in the dependent parts, particularly the ears and back of the neck. No overt putrefactive changes were observed, the odor being much less than ordinarily noticeable, and in no respect peculiar. The body was fairly nourished and bore, externally, no evidence of disease, save an almost inappreciable thickening from inflammation of the skin of the face just underneath the eyes.

There was a little fluid in the left pleural cavity, which showed some adhesions posteriorly; the right one was nearly obliterated by very firm adhesions of no great intrinsic thickness. The left lung showed a little vicarious emphysema about the fissure and its lower and anterior borders.

The heart and pericardium presented no abnormalities; but a paleness in color of the substance of the former with some friability was determined upon at the very close inspection demanded by the con-

dition of the intima of the arch of the aorta. This showed three whitish, irregularly oval-shaped patches, with raised, cord-like edges. There was no actual destruction of tissue; but appearances suggested beginning atheroma. They varied from 15 to 20 millimeters in length, their breadth being one-half their length, and their long axes were in the direction of the vessel. Near the origin of the left subclavian and carotid arteries there were several deeply reddened patches of somewhat larger size, two of which were covered with clot, which I thoughtlessly detached under the water tap. The blood in the large venous trunks was fluid and very dark in color.

The left cusp of the pulmonary valve at its anterior extremity showed a small papilliform enlargement that seemed of hemorrhagic origin. The larger cusp of the mitral valve was covered in its center for half its area by a whitish patch, which seemed to increase the opacity of the tissues without adding to their thickness. There were no evidences of endocarditis found after very careful search; certainly neither ulcerations nor vegetations.

The pathological appearances resolved themselves under the microscope into a somewhat intense capillary injection with very little inflammatory exudation, either corpuscular or fibrinous, even in places where the processes were most intense. The outlines of the elements were much obscured in what appeared like a mucoid degeneration. The bacilli hereinafter described were present in such numbers as to stain with Delafield's hematoxylin.

The stomach contained about a pint of fluid well mixed with partly digested food; it, with the rest of the intestinal tract and the other organs of digestion, appeared healthy in every respect. The liver was normal to naked eye appearances, except for an alteration in its color (more noticeable after hardening in alcohol) best described as leaden. The spleen was adherent to the anterior wall of the abdomen, and it ruptured under the force necessary to separate it. It appeared intensely injected.

The kidneys were normal in size and in all appearances, save for the high contrast afforded the too light colored pyramids by the cor-

tical substance. That this was too great was not admitted by all four of the medical men present at the time they were examined. There was no adhesion of the capsule of either. At the upper posterior part of the right one a small retention cyst was found. It was spheroidal, about 15 millimeters in diameter, and contained only sanious fluid. Some rather large vessels crossed over its inner wall. That part of the cortex limiting it posteriorly contained several small hemorrhages, and mounted sections of it show many small perforations, some of which have resulted upon the destruction of glomeruli and of structures contiguous to them.

So few microscopical evidences of disease were present in this kidney that it was doubted whether it would show much structural alteration by two observers, who had been asked, each independently of the other, to examine it, after it had been preserved in alcohol for some time. Unfortunately the urine in the bladder was not collected either for the estimation of its quantity, to determine in some measure the rate of excretion by these organs immediately prior to death, or for examination.

Microscopically the kidneys show a very intense nephritis, even the glomeruli participating, as their enormously proliferated nuclei show. There is some thickening of the smaller vessels, but few evidences of the existence of chronic endarteritis. Hemorrhages are rather numerous in the vicinity of the cyst mentioned. There is much degenerative change in the tubular epithelium. A few of the tubules contain hyaline casts, and some collecting tubes casts that seem made up of nuclei very little changed. No coagulation necrosis was found, and no albumin could be demonstrated in the capsule of Bowman in those sections in which a solution of it had not been used in the process of mounting the tissue (Mayer's method).

The brain was not examined. Every portion of the tissues examined, the kidney, liver, spleen, myocardium (left ventricular wall and the largest columna carnea of that ventricle), the mitral valve, the wall of the aorta, and the pulmonary artery and one cusp of its valve, was found to contain swarms of a bacillus that decolorized by Gram's method, but which stained readily with the usual aniline col-

ors and even with hematoxylin, as has been stated. The margins of some sections of kidney and liver and the adventitia of the large vessels, contain a bacillus that stains after Gram; it may be a *post-mortem* invader—possibly it is an associated infecting agent.

The size of the former bacillus (1 to 1.1 micromillimeters broad, and 3 to 6 micromillimeters long), its tendency to occur in chains of from 3 to 6 end to end, and its staining reaction, suggest forcibly the bacillus of malignant edema, whose pathogenetic attributes vary between somewhat widely separated limits. Welch has shown the accountability of another microörganism for much mischief formerly ascribed to the bacillus under consideration, and, as I remember, in the only case directly attributed to the latter in American literature (Hoegh's case: *Medical News*, v. 57, p. 310), the presence of the organism in the tissues was not ascertained.

The following clinical history affords little information as to the nature of this infection, or the source whence it arose:

X——, sailmaker, American, aged 60½ years, a most methodical man, of correct habits and well ordered life. His dwelling in Vallejo, Cal., where he spent his time when off duty, was regarded by his medical attendant as insalubrious from general considerations merely. I have been told by a former physician of his that he had been much troubled by facial erysipelas of late years; but none of these attacks seem to have incapacitated him from carrying on his comparatively light duties as officer of the deck aboard a receiving-ship. For two months before his death he had considered himself out of health and had lost ten pounds in weight.

On March 8th, both cheeks below the eyes were swollen only a very little, being reddened and slightly brawny. The heart was acting feebly; pulse at the wrist, 36 per minute. Urine scanty, showing no albumin by heat nor by Heller's nitric acid test. Tonics and cardiac stimulants, with an ichthyol ointment locally, were prescribed. He strongly demurred to going on the sick-list, and at length was ordered to go to his home by Surgeon Ross, who impressed upon him the necessity of good care, nourishing food,

and rest. He was seen there on the next day by the doctor. His heart was acting feebly and badly, and he is noted as appearing bloodless. Further attempts at cardiac stimulation were made throughout the day. About 8:30 P. M., after a fairly hearty supper, he complained of some indefinite uneasiness, and, in the absence of his companion, who had gone for assistance, he fell from the sofa lounge, where he had been lying partly dressed, to the floor, on which he was found lifeless.

No one can regret more deeply than I the incompleteness of the work on this case, for which I had no opportunity to prepare in any way. When I found the Gram-decolorizing bacillus, I inoculated a rabbit with a bit of tissue out of 80 per cent. alcohol, in the hope that some spores might survive; and I still have the animal under observation, showing a fibrous nodule under his skin that encloses the fragment of aorta. I am sensible of many grave sins against science in detailing at such length a case open to the inclusion of so many fallacies; but I shall plead in extenuation the importance of the serious kidney lesion, which was entirely without symptoms in the life of the patient, and the presence of a bacillus that may not have been an agent of decomposition.

This indiscretion recalls the experience of an enthusiastic bacteriologist, who had found what appeared to him like anthrax bacilli in the kidney of a woman dead of puerperal septicemia. After many triumphant demonstrations, he showed it to a very eminent pathologist, who said, impressively: "Young man, you can't fool me. That's a piece of rotten kidney." My sections may show only a little of that same; if so, things seem to me to have rotted very interestingly.

The second case is that of a Chinese servant, who presented slight thickening and swelling of the right cheek. I have seen a good deal of erysipelas in mulattoes and in the Alaska Indians, who are in many particulars much like Mongolians; and I doubted at the outset if this were an attack of that disease. He had a temperature of 102° F. for the first day only; afterward it did not exceed 99° F. Small vesicles, closely resembling those of zoster, appeared on the second

day; but I was unable to satisfy myself as to the presence of micro-organisms in the serum from them, being unable to exclude extraneous matter, and to make cultivation experiments. There was slight malaise and some pain in the limbs, but no nausea. The urine was normal in all respects. A medium-sized rabbit was inoculated with serum from a vesicle and with blood and serum from the actively inflamed border of the patch of affected surface, in the peritoneal cavity, in the vein of the ear, and in the subcutaneous connective tissue. No appreciable disturbance of its health resulted.

On the third day there was noticeable abatement of the inflammation under the use of a moist dressing; on the fourth the trouble had extended posteriorly, involving the right ear and the skin over the mastoid process, extending as high as the temporal ridge. It appeared to be much less violent in character, and no other vesicles formed. This is noted to exclude drug eruptions, as the treatment was not changed from the beginning; some vesicles, moreover, were seen where the disinfectant was not applied, *e. g.*, over the right nasal bone. There was only very slight tenderness, no spontaneous pain, and hardly any lymphatic involvement.

A second inoculation of the rabbit was made as thoroughly as possible on the fourth day, but without positive result of any kind. At this stage of the case the patient refused to take any more tincture of iron, although he yielded to my professional solicitations to the extent of continuing the local application. As he was obviously convalescing, I consented to his consulting his Chinese physician, and I helped him to get leave of absence for that purpose.

He returned, well, at the expiration of his leave, and he amazed me almost beyond expression with his pidgin English account of the consultation. His respected adviser, he gave me to understand, like myself, was not quite clear in his own mind as to the exact nature of the disorder; he considered that it was unnecessary for him to prescribe, as he was convalescent, and no honorarium was desired. He was well-disposed enough to add that the man-of-war's doctor

had done very well for him, difference of race considered. I disclaim the personal compliment implied in choosing to ascribe the impressive nature of the medical services rendered to the presence of the rabbit in the case. Great is bacteriology, even in its failures!

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