

whether the inability to detect formalin after certain intervals of time was accompanied by any loss of preservative power as shown by excess of lactic acid. The acidity was determined by titration with one-tenth normal caustic potash using phenol-phthallein as an indicator and calculated as lactic acid. The figures for unpreserved milk are given as a control. At the time of purchase the milk exhibited an acidity of 0.099 per cent. calculated as lactic acid.

TABLE III.

	Percentage of acidity calculated as lactic acid.		
	After 5 hours.	After 24 hours.	After 48 hours.
Unpreserved milk	0.198	0.688	0.720
Milk 0.005 per cent. formaldehyde ...	0.144	0.184	0.697
Milk 0.0025 per cent. formaldehyde ...	0.144	0.261	0.810
Milk 0.001 per cent. formaldehyde ...	0.135	0.693	0.738

On comparing Tables II. and III. it will be found that when formaldehyde is present it checks the development of the lactic acid. Thus, after 24 hours 0.005 per cent. formaldehyde becomes 0.00375 per cent. and is associated with 0.184 per cent. lactic acid, but on the further reduction of the formaldehyde at the end of 48 hours to 0.00025 per cent. the lactic acid is increased to 0.697 per cent. This shows that after a lapse of time formalin in milk not only ceases to respond to chemical tests but also loses its preservative powers, thus indicating that in all probability it undergoes some fundamental change.

Southwark, S.E.

TWO CASES OF POISONING BY MUSSELS—ONE FATAL.

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On the afternoon of July 13th two sailors, one aged 57 years and the other aged 70 years, gathered some mussels from a dock gate. It was known that the water was polluted by sewage but in spite of this the inhabitants of the place often ate shell-fish gathered from this situation. The mussels were carefully washed and cooked thoroughly in several changes of water. They were then eaten, flavoured with salt and vinegar. About four hours after the meal both men were seized with giddiness. They described the feeling as like that of gradually wading into water out of their depth. Their legs became unsteady and they felt as if "they could fly." They were soon unable to stand and were taken below and medical aid was summoned. The first-named patient vomited several times. When first seen the signs and symptoms were much alike in both cases. The patients complained of giddiness and were unable to sit up in bed. They had slight abdominal pain. There was mental excitement and the condition resembled closely the early stages of alcoholism. The pulse was full and bounding but not increased in rapidity, being 76 in one case and 80 in the other. The heart sounds were clear and loud. The temperature was normal. There was numbness of the extremities, especially the hands, and sensation was much diminished. The elbow and knee reflexes were present and not exaggerated. The pupils were dilated but reacted to light. In both cases the abdomen was distended and tympanitic but there was only very slight tenderness on firm palpation in the epigastric region. As it was now five hours after the eating of the mussels the stomachs were not washed out but a moderate dose, one and a half ounces, of oleum ricini was given in spirit. Both men, however, began to experience dryness in the throat and a feeling of constriction in the neck. Quite suddenly the first-named patient had an attack of syncope and died. The symptoms in the case of the other patient grew gradually worse. His abdomen became more and more distended and he was slightly delirious and was with difficulty restrained in bed. At each attempt to rise a syncopal attack was

brought on and he complained much of difficulty in breathing. This difficulty was greatly relieved by repeated cold compresses on the neck. Hot fomentations were applied to the abdomen to relieve the distension but without much result. Hot, strong coffee was given by the mouth but the patient had the greatest difficulty in swallowing it and very small quantities had to be given, at a time. The effect was very marked, the patient feeling much better after each drink; but this result was transient and the coffee had to be repeated frequently—about every half hour. Aromatic spirit of ammonia was given in a half-drachm dose in hopes of relieving the abdominal distension, but though the spirit was diluted to one ounce a bad result was produced, the patient nearly choking and a syncopal attack following. As the oleum ricini showed no signs of acting after six hours a large soap-and-water enema was administered with good result. The patient felt much better after this and was able to be removed to the Avonmouth Cottage Hospital. On admission a draught containing saline aperients and cascara was given but no result was produced in three hours, so further enemata were resorted to. Under this treatment the patient made rapid improvement. The tongue, which had become very furred and dry, cleared and the restlessness passed off and the patient fell asleep. On awaking he complained of headache and giddiness, but these symptoms passed off in two days. On admission his urine contained half albumin, on the next day this amount had diminished to one-third, and on the following morning to less than one-sixth. When seen four days afterwards the patient felt quite well. The urine still contained a trace of albumin, but this may be accounted for by old kidney disease. The patient admitted that he had suffered from Bright's disease.

The post-mortem examination of the first-named patient revealed nothing special. The usual signs of heart failure were present and the heart was even more flabby than is generally the case. The mucous membrane of the stomach, the duodenum, and upper part of the jejunum was pale. The brain was also anæmic. There was no macroscopic change in the kidneys, which appeared quite healthy, nor was the spleen enlarged. The urine drawn from the bladder contained one-sixth albumin.

The principal features of these cases were: (1) the difficulty in eliminating the poison from the system, as neither flatus nor fæces were passed even under the influence of purgatives, the gut appearing to be paralysed; (2) the tendency to syncope if the patients attempted to sit up; (3) the afebrile course—in neither case did the temperature rise above normal; (4) the comparative infrequency of the pulse, which never rose above 80 even when syncope threatened; and (5) the marked beneficial effect of coffee on the pulse and on the general condition of the patient. It is curious to note that the first-named patient, who was 13 years younger than the second, who vomited freely comparatively soon after eating the mussels, and who had presumably healthy kidneys, succumbed to the toxins which the other resisted. Both men had eaten about the same number of fish.

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A NEW PATHOGENIC BACTERIUM CAUSING BASAL MENINGITIS IN INFANTS.

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CASE 1.—A male, aged one year and ten months, was admitted to the Paddington Green Children's Hospital, under the care of Dr. Guthrie, with a history of six days' illness, the symptoms being drowsiness and vomiting. There was no history of otorrhœa. When admitted he was apathetic and drowsy but not comatose and apparently not in pain. There was no squint and the pupils were contracted but reacted to light. There were no convulsions and no rigidities; the reflexes were normal. Kernig's sign was not given. There was a well-marked tache. Three days after admission there was definite retraction of the head and the patient had several convulsive fits with general rigidity of the body and limbs and conjugate deviation of the head and eyes to the left. On the next day there was internal squint of the left

eye and the pupils were dilated and did not react to light. Six days after admission the respiration was affected, becoming sighing and irregular. The eyes were examined and the retinal vessels were found to be congested; the discs were pale, with indistinct edges. The convulsions ceased. Eight days after admission lumbar puncture was performed. The fluid was quite clear and contained but a trace of albumin. The microscopical appearance of films from the deposit of the lumbar puncture fluid and the result of cultures will be described below. The temperature on admission was about 100° F. and rose gradually and fairly uniformly until death occurred, reaching 104° as its maximum. The child died nine days after admission, or 15 days after the onset of the disease, and the day before death seemed to suffer from pain in the left ear.

Necropsy.—At the post-mortem examination extensive basilar meningitis was found. There were large and thick collections of greenish lymph of gelatinous consistency in the region of the anterior perforated space, the tips of the temporo-sphenoidal lobes, and under the central lobe of the cerebellum, but thinner sheets of the same material united these main collections and extended along the vessels, especially in the Sylvian fissure. The condition was practically symmetrical. The surface of the brain was hyperæmic and the convolutions were flattened. The ventricles were moderately distended with fluid which was colourless and slightly turbid. The right middle ear was normal, containing only the mucoid material so commonly seen in young children. The left contained thick pus. The membrane was intact on both sides. The sinuses were normal. Cultures and films were made from the cerebral pus and films were made from the pus in the left middle ear. There were no other morbid appearances in the body except that the retroperitoneal and mesenteric glands were enlarged but apparently not tuberculous. The films prepared from the cerebro-spinal fluid obtained by lumbar puncture showed but few cells, those present being mostly degenerated endothelial plaques. They showed vast numbers of organisms which were so variable in shape and size as to indicate the presence of a large number of species. The prevailing form was a diplococcus which varied greatly in size, the smallest forms being no larger than meningococci whilst the largest were fully three times that size. The individual cocci were quite round, or more frequently short cylinders with rounded angles. There were also single coccoid forms, often of large size (3 μ or 4 μ in diameter). Lastly, there were numerous bacillary forms which resembled the individual cylindrical cocci mentioned above but in which the length was three or four times greater than the breadth. They showed very marked polar staining. There was no sign of spore formation. Slight indications of the presence of a narrow capsule occurred but this might have been an artefact. The organisms did not stain by Gram. They were almost entirely extracellular. The culture was prepared by allowing the fluid to flow directly from the needle on to ordinary agar and after 24 hours' incubation presented numerous isolated colonies. Three of these were common air organisms (two of *sarcina alba* and one of *micrococcus roseus*) whilst the remainder were similar to one another and of a greyish-white colour. Films prepared from these latter colonies showed the presence of an organism exactly resembling those seen in the films except that coccoid and bacillary forms predominated, the diplococcoid form being comparatively infrequent. Some giant diplococci of large size and great affinity for stains were present. The appearances of the colonies indicated that they were pure but they have been repeatedly plated out without losing any of their characteristics. The films made from the pus from the ear and from the meningeal exudate showed organisms exactly like those seen in the lumbar puncture fluid, but unfortunately no cultures were made.

CASE 2.—A male, aged nine months, was admitted to the Paddington Green Children's Hospital under the care of Dr. Sutherland, having been ill for one month. The illness began by convulsions and vomiting. The latter continued but the former passed off and was replaced by twitchings of the hand and head. Four days before admission his neck became stiff. On admission the child was conscious but apathetic; he lay on his back with his legs in a position of flexion. The pupils were moderately contracted and reacted well and there was no squint. There was a slight nasal discharge. The tympanic membranes were examined and appeared to be healthy. There was a slight tache and Kernig's sign was present on both sides. There was

occasional vomiting. After a day or two in hospital he became extremely restless, with constant twitching of the extremities, cerebral breathing became marked, and the abdomen became retracted, whilst the rigidity of the neck increased. Eight days after admission lumbar puncture was performed. The fluid had a yellowish tinge and contained a large quantity of albumin. From this point the child steadily went downhill and died 19 days after admission, or about seven weeks from the onset of the disease. The temperature on admission was about 98° F., with occasional brief excursions to 100° or thereabouts. It rose gradually until it averaged about 101° and remained so until 36 hours before death, when it suddenly rose to 107°.

Necropsy.—The post-mortem appearances in this case were quite similar to those in the foregoing but more marked. Large masses of creamy, greenish-yellow pus occurred beneath the pia mater at the anterior perforated space and the tips of the temporo-sphenoidal lobes whilst there was but little on the lower surface of the crura and cerebellum. The pus tracked alongside the vessels on to the hemispheres but not to so great an extent as in the previous case. Here, however, there was a great excess of turbid fluid in the pia-arachnoid space at the base of the brain, a condition which did not occur in the previous case. The convolutions were flattened and the meninges over them were hyperæmic. The ventricles were greatly distended with turbid fluid and contained coagulated masses of creamy, yellowish-green pus. The lining membrane of the whole ventricular system was injected and apparently œdematous, yet moderately tough; it could be readily peeled away from the subjacent tissues and had the general appearance of granulation tissue. The iter was greatly dilated. The spinal cord was also affected, a layer of greenish pus extending down the dorsal surface as far as the conus medullaris. The middle ears were full of greenish pus similar to that seen in the brain and the membranes were intact. There was no thrombosis of sinuses. The abdominal lymph glands were enlarged but not caseous. Nothing else abnormal was noticed. Cultures and films were made from the pus from the brain and ears. The films prepared from the lumbar puncture fluid in this case were richer in cells than in the foregoing, highly degenerated polynuclears being present as well as endothelial cells. Here also there were vast numbers of organisms, the predominating form being a bacillus which was about as wide as those present in the previous case, or a little narrower, and of very variable length; the shorter forms were but slightly longer than they were wide, and the longest forms were leptothrichal filaments reaching a third of the way across the field of a $\frac{1}{2}$ inch lens. In the more abundant forms the length was about four or five times the breadth. Polar staining was fairly well marked, there was no spore formation, and they did not stain by Gram. They were mostly extracellular, though clustered about the cells, but in a few cases they seemed to be engulfed and to lie in vacuoles in the protoplasm. There was the same doubtful appearance of capsulation. In this case coccoid and diplococcoid forms occurred, but were uncommon. In the films prepared from the pus from the ears and meninges of this case similar bacteria were seen but were much less numerous; here also the bacillary forms predominated, though large diplococcoid forms occurred. Capsulation was better marked.

So different were the appearances of the organisms in the above cases that their identity was hardly suspected until cultures made from the meningeal and tympanic pus were examined. These showed abundant growth in 24 hours and both were pure, presenting on microscopic examination appearances identical with those seen in the culture from the lumbar puncture fluid in the first case. The cultural characters have not been worked out in full but the following features will probably suffice for the recognition of the organism. The growth on agar at 37° C. was extremely rapid, isolated colonies acquiring a diameter of three or four millimetres or even more in 24 hours. They were white or greyish-white in colour, opaque, and were circular in shape and often had slightly raised edges. They rapidly extended and the whole surface of the medium was soon covered with a uniform whitish layer. Streak cultures on agar showed a similar flat growth which spread quickly. The organism grew well on gelatin at the ordinary temperatures. Streak cultures showed a featureless ribbon-like growth similar to that seen on agar but without the same tendency to spread. Stab cultures were more characteristic. The growth was white or slightly grey and opaque. It extended to the bottom of the stab but was slightly more abundant at the top, whilst

on the free surface there was a rounded button of growth very similar to that seen in cultures of bacillus pneumoniae. The gelatin was not liquefied. Growth in broth was not very abundant. At first the medium was uniformly turbid, whilst after a time there was a slight deposit. No scum was formed. The microscopic appearances of the organisms from the cultures were on the whole similar to those seen in the lumbar puncture films in the first case, but there were minor differences. The single coccoid forms predominated and in some cases of very large size. Diplococci also occurred. Lastly, there was a small proportion of bacilli, some of them quite long and in some cases clubbed or spindle-shaped. They stained uniformly or showed polar staining, and there were no spores. The organism was non-motile and did not stain by Gram.

CASE 3.—This case does not call for prolonged notice. The patient was a girl, aged two years and eight months, who was admitted to the Paddington Green Children's Hospital under the care of Dr. Guthrie. She was ill for 18 days with typical symptoms of meningitis. Her temperature kept about 100° F. until just before death, when it rose to 109°. There were no signs of tubercle (except, perhaps, a few crepitations at the right base) and the condition was diagnosed as cerebro-spinal meningitis. Lumbar puncture fluid was almost clear and contained but little albumin. It showed few cells and numerous organisms similar to those seen in the two cases described above. No cultures were taken.

Necropsy.—At the post-mortem examination there were extensive tuberculosis of the lungs and mesenteric and abdominal glands and tuberculous meningitis. The ears contained muco-pus. Cultures were made from the meningeal exudate and from the pus in the ears and gave numerous colonies of the organisms described above, together with a few colonies of yellow and white staphylococci. This was a secondary mixed infection, probably from the middle ears.

The above cases 1 and 2—fatal cases of basal meningitis in infants which have occurred recently in the Paddington Green Children's Hospital—are of peculiar interest in that they were associated with, and appeared to be due to, an organism quite unlike any known pathogenic bacterium; whilst in a third case, one of tuberculous meningitis, the same organism greatly predominated in a mixed infection which took place before death. The above is a brief account of the clinical history and post-mortem appearances of these cases. I reserve a fuller account of the pathogenic organism for a future occasion when its characters have been more fully investigated. The two cases in which this organism was present in pure culture in the exudate in the cerebral and spinal meninges, and in the pus which was present in the middle ears, occurred within three weeks of one another. Both patients came from the West of London but not from the same district, and there was no reason to suspect a common source of contagion.

In the three cases mentioned above we find the organism was isolated in cultures once during life from the cerebro-spinal fluid and twice after death from the meningeal exudate and also from the pus from the middle ear. It was seen in films from the lumbar puncture fluid, from the meningeal lymph or pus, and from the tympanic pus in all cases. It seems fairly certain that it must be regarded as being the cause of the disease in the first two cases and as an important secondary infection in the third. The association of pus in the middle ear in all three cases and the presence therein of the same organism as was found in the brain is of some interest in connexion with the etiology of the disease and of meningitis in general. It is, of course, impossible to say whether the brain was infected from the ear or *vice versa*. A point in favour of the view that the ear became infected secondarily is the fact that in the first case no pain in the ear was noted until the day before death, whilst in the second case there was a discharge from the nose, suggesting another possible source of infection. It is very unfortunate that this discharge was not examined bacteriologically. In this case, too, it is noteworthy that there was no notice of any symptoms pointing to pain in the ear, suggesting that the inflammation may have come on whilst the patient was semi-comatose; further, the ears were examined on admission and the tympanic membranes were found to be normal. On the other hand, in the few cases of septic meningitis following injury in which I have had an opportunity to examine the ears there has been no suppuration, suggesting that a purulent inflammation does not easily travel in that direction.

I have to thank Dr. Guthrie and Dr. Sutherland for permission to publish these cases, and Mr. Holland and Mr. Gilford, house physicians to the hospital, who performed the lumbar punctures and provided me with the materials thus obtained.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF SURGICAL EMPHYSEMA AS A COMPLICATION OF DYSTOCIA.

BY WILLIAM M. EMMERSON, L.S.A.

THE patient in the following case was a primipara, aged 22 years; she was small but well built and well nourished and was in good health. Labour commenced about 7 A.M. When I saw her at 9 A.M. labour pains had fairly set in; the membranes had ruptured and the size of the os was about that of a shilling. Abdominal palpation established the fact of a head presentation but the position of the head could not be satisfactorily determined. As the presenting part came within reach of the finger the mouth and nose were recognised, causing a face presentation to be diagnosed. As the head was fixed, the pains good, and the pelvis fairly roomy I decided not to interfere with the presentation but leave the case to nature and two grains of pilula opii were administered. At 7 P.M. the patient was in strong labour and the child's face was well down on the perineum. Its advance was now slow and the pains became violent, birth taking place at 7.50 P.M. A few minutes prior to the birth the patient's appearance was normal, but immediately after the long and violent effort which expelled the foetus her face was noticed to be much swollen and she complained of a choking sensation. Her pulse was 110 per minute, weak but regular, and she was much exhausted. I attributed the swelling to congestion, which I have before observed, but on the next day the face was still greatly swollen, as was also the neck, the malar bones and prominence of the clavicles being obliterated. She still complained of the choking sensation. Palpation over the clavicles and bony parts of the face gave a crackling sensation to the fingers.

On examining the chest the same sensation was felt over the ribs and auscultation revealed fine hair-like crepitations over the whole front of the thorax and neck. The percussion note was normal all over. There was no *bruit d'airain* or other sign of pneumothorax. The pulse-rate was still 110 and the temperature was 99.5° F. The patient had slept fairly well and beyond the choking sensation there was no discomfort except slight shortness of breath. The swelling and auscultatory phenomena gradually decreased and completely disappeared in four or five days' time. With the exception of retention of urine, necessitating the use of the catheter for two days, convalescence was uneventful. Careful subsequent examination of the chest revealed no alteration in the percussion note at the apices or elsewhere and no signs of tubercle. The patient is now, after a lapse of two months, in her usual good health. The condition was presumably due to rupture of air vesicles on one or both sides of the chest caused by the violent bearing-down efforts, the air escaping into the neck at the root of the lung. The patient was delivered of a stillborn foetus with posterior hydrancephalocele and omphalocele.

Hebburn-on-Tyne.

A CASE OF EXTRAVASATION OF URINE.

BY THOMAS P. CODD, L.K.Q.C.P., L.R.C.S. IREL.

THE following case of extravasation of urine may interest some readers of THE LANCET.

The patient was a man, about 50 years of age, who had for 21 years been suffering from traumatic stricture which occasionally caused retention of urine, but he was generally able to relieve himself by using a French bougie catheter No. 4. He was a Spaniard and was once treated by a Greek medical man who told him when he could not pass urine to use a French bougie No. 4 and after passing it down to the