eosinophile cells. I have examined six cases of advanced tuberculosis pulmonum, and in five the quantity of these cells was almost enormous.

6. In almost all specimens of early non-purulent inflammation in man, rabbits, guinea-pigs, dogs, or frogs, a large number of eosinophile cells is found in the tissues and vessels. These observations extend already over a long series of cases.

7. In muco-purulent nasal secretions numerous eosinophile cells are often noticed, and even human saliva at times contains some, though not in any large number.

8. Professor Dreschfeld mentions that they have also been found in nasal and pharyngeal polypi, and Neusser and Canon have seen them in the corium of the skin in certain cutaneous affections.

The part played by the eosinophile cells in health and disease is not yet known, and observations on the morphology of the leucocytes in febrile diseases, and other pathological as well as physiological conditions are greatly wanted. This however is certain, that we cannot rely on the eosinophile cell in the diagnosis of leukæmia, whether splenic or myelogenous. Animal experiments show that this cell is quite independent of the spleen or lymphatic glands,¹³ and that its myelogenous origin is extremely doubtful. In the frog they are certainly not myelogenous, since they can be made to increase in the amputated leg after removal of the bones. We see then that (1) leucocytosis with an increase of the eosinophile cells does not occur in all cases of leukæmia; (2) leucocytosis with an increase of the eosinophile cells is found in other affections besides leukæmia; (3) these cells are by no means specific for leukæmia; (4) judging from animal experiments, they are quite independent of the spleen and lymphatic glands, and probably also of the bone-marrow. The only logical deduction from these considerations is, that the eosinophile cells are of no diagnostic value in leukæmia or Hodgkin's disease.

ON INTESTINAL OBSTRUCTION DUE TO GALL STONES: WITH A REPORT OF A CASE SUCCESSFULLY TREATED BY LAPAROTOMY.

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THE subject is one of considerable importance, as will be gathered from the fact of over 100 cases being on record; and undoubtedly many examples occur without being recognised. Intestinal obstruction dependent on gall stones may occur during a severe attack of biliary colic, from paralysis due to intense nervous shock, or local peritonitis, or both; but although the vomiting may be severe and persistent, and the prostration so intense as to assume the form of collapse, obstruction seldom becomes complete, and usually resolves under treatment by morphine and restriction of diet. This, however, is not the variety I purpose considering now, which is also the common and usually accepted form of intestinal obstruction when due to biliary concretion. I refer to mechanical obstruction dependent on a large gall stone producing a block in some part of the intestinal tract. The following case is a good example.

Acute Intestinal Obstruction due to Volvulus set up by Passage of Large Gall Stone; Laparotomy; Cure.—Mrs. H. E., aged 68, was admitted on November 12th, 1890, with acute intestinal obstruction. Dr. Hamilton, of Crowle, Lincolnshire, who brought the patient to see me, gave me the following history: She had enjoyed very good health up to eight days previous to admission, when she was suddenly seized, without warning, with intense abdominal pain and vomiting. For three days the vomiting was incessant, and on the fourth became stercoraceous. Enemas and medical treatment were tried without success. On the eighth day she was brought by train and ambulance to the infirmary. The bowels had not been relieved from the first, although a little flatus was passed up to the date of admission. When admitted, the abdomen was much distended and hyper-resonant on percussion. Pulse 110; temperature 99°. She was fully under the influence of opium. Nothing abnormal *per vaginam* or *per rectum* to be felt. At the end of twelve hours she had vomited twice; vomit stercoraceous. Pulse 130; temperature half a degree lower than before. A distended coil of bowel could be felt near the umbilicus, and

from this point the coils of intestine could be seen to move. The A.C.E. mixture having been administered, the abdomen was opened in the middle line. The small intestine was much distended, the large intestine collapsed. A congested loop of the ileum was then found with a marked constriction at the ends. On rotating this on its mesenteric axis, it gave a sudden twist, and gas and fluid contents were felt rushing through it. On examining the coil, there was found a deep furrow across it, surrounded by recent inflammatory lymph.

The abdomen was closed, and as the loop was deeply congested, it was stitched in the wound, but not opened. The patient made a good recovery. The second day faeces passed from the wound on account of a stitch hole giving way. On the third and fourth day copious motions were passed *per rectum*, and she was practically convalescent at the end of a week, when a gall stone the size of a large walnut passed *per anum*. This had probably been the exciting cause of the volvulus. The minute faecal fistula soon closed, and when I heard of the patient two months after she was in good health.

It might naturally be thought that the process of ulceration and the establishment of a fistula between the bile passages and the bowel would be so characteristic that this form of intestinal obstruction would be always easily diagnosed, but this and many other cases entirely disprove it.

The following remarks of Mr. Hutchinson serve to show how difficult, or even impossible, it may be to arrive at a correct diagnosis: "To turn to the class of cases in which real obstruction is present, we may ask the question: Is it possible to make a diagnosis of a case in which the small intestine is plugged by a gall stone? I maintain that it is not practicable to get further than a mere conjecture. If the case is recent, it will count as one of acute intestinal obstruction, and a band, or a twist, or some other form of internal strangulation will be suspected.

"Such has, I believe, actually been the diagnosis in almost every case where the abdomen has been opened and a gall stone found.

"A differential diagnosis is simply impossible, for the symptoms are the same. There is little to help us excepting the history of an early stage of symptoms referable to the region of the gall bladder, and this is in many cases—I think in the majority—wholly wanting. If the duration of the case have been longer and it have passed into one of chronic obstruction, we still have nothing except the history by which to distinguish it from cases due to other causes. Cases of block by hardened faeces and by malignant stricture may each in turn resemble it."

A careful consideration of the cases I have seen, and of others that have been reported in the journals and elsewhere, confirms my belief in the opinion so well expressed in the previous quotation, for, as a rule, it is impossible to diagnose obstruction from gall stones from other conditions causing acute intestinal obstruction; therefore, the surgeon should always bear gall stones in mind when called upon to treat acute obstruction.

As jaundice is nearly always absent in these cases, I think it clearly proves that these large concretions gain access to the bowel by a process of ulceration instead of in the ordinary way through the bile ducts. I think it quite probable that the initial acute symptoms may be due to paralysis of the gut, owing to local peritonitis, although the later symptoms are undoubtedly due to the mechanical block caused by the concretion; but arguing from the history of the cases reported and of those I have observed, it is usually impossible to make any distinction between the different stages of the affection, the patients being generally seized with pain and vomiting, and these being rapidly followed by persistent obstruction, until either the stone passes into the large intestine or gets pushed aside, ceasing to obstruct, or is removed surgically.

The following example, related by Böllinger, illustrates how the passage is effected. "In a case in which there was evidence of obstruction of the bowels laparotomy was performed. The patient died with septicæmia, and there was found after death a large gall stone impacted in the jejunum and a large fistula between the gall bladder and duodenum. There were numerous gall stones in the gall bladder and several in the fistula."

If a gall stone be sufficiently small to pass through the common duct into the intestine, it seldom produces intestinal obstruction, although the pain, sickness, and constipation may simulate it and lead to a little difficulty in diagnosis. I have on several occasions been asked to see such cases by my medical friends, and I believe the similarity to be greater than is usually supposed, and it certainly is

¹³ Cf. previous paper by the author, *loc. cit.*

deserving of more attention than it usually receives. As a rule, under the circumstances, the small stone will not be discovered in its passage through the anus, unless specially sought for; but where large gall stones are parted with after producing intestinal obstruction, their passage *per anum* is usually characterised by such pain as to lead to their discovery.

In connection with treatment it may be well to mention the views of the two schools, the one advocating early operation by laparotomy, as in intestinal obstruction due to other causes, the other advocating treatment by opium, starvation, injections, and massage under an anæsthetic.

In one case, in a lady aged 65, I felt so sure of the obstruction being due to gall stones, that I ventured to treat the case on expectant principles, using opium as required. At the end of a fortnight sudden and complete relief ensued, and a large gall stone was evacuated. But in this case the history of pain over the gall bladder for a considerable time, succeeded by symptoms of peritonitis in the right hypochondrium, and then followed by intestinal obstruction, left very little doubt as to the cause of the obstruction.

This case is however exceptional, therefore, in face of the improbability of an exact diagnosis being made, any case of acute obstruction may be one in which speedy death is the only alternative to immediate relief, as in strangulation by a band or by an internal hernia. If laparotomy be performed and the cause be discovered to be an impacted gall stone, the obstruction may be removed either by needling the calculus through the walls of the bowel or otherwise crushing it, or by pushing it onward. This failing, the stone may be removed by enterotomy, the intestine being subsequently sutured.

If it were possible to be certain that a gall stone was the cause of the block, the expectant form of treatment would be fully justified, since the probability, arguing from published cases, is that the gallstone would eventually pass; but accepting the diagnostic difficulties we cannot help feeling that if relief by medical means does not speedily come, the surgeon is accepting a great responsibility in waiting for Nature's cure.

PRELIMINARY NOTE ON SOME MICRO-ORGANISMS OF NORMAL SKIN.

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It is a well-known fact that on the surface of the human body dwell numerous micro-organisms, even under normal conditions of the skin, but, in spite of the importance of the subject, it has been little worked at. Bizzozero, in 1884, was the first to go into the subject, and was followed by Bordoni-Uffreduzzi, Mittmann, Maggiora, Preindlsberger, and others. But these observers have worked in a rather desultory manner, and have, as a rule, confined their attention to the microphytes on some particular part of the skin. It is my intention to make a more exhaustive investigation, and in the meantime I propose to describe shortly a few of the organisms I have already isolated, and of which I can find no description in any of the papers and books I have consulted, and to which I have ventured to give provisional names. The portions of the body selected are the skin between the toes, the cruro-scrotal region, the contents of sebaceous glands in the face, the inner surface of the prepuce, the forearm, hairs and scales of the scalp, tip of the finger, and the space beneath the finger nail. In every case the skin was first washed in the ordinary manner to remove to a certain extent organisms which had settled from the atmosphere; then the epidermis was moistened with sterilised water and scraped with a sterilised knife; gelatine and agar-agar plate cultivations were then made of the scrapings.

I.—*Bacillus Epidermidis Capsulatus*.

This organism was obtained from scrapings of the skin between the toes.

Morphology.—A large motile bacillus with rounded ends, occurring mostly in twos, some forming long rods. In old cultures there is a tendency to involution forms shown by enormously long rods with irregularly distributed proto-

plasm. In gelatine cultures the organism displays a distinct capsule, absent in cultures on other media.

Biology.—Gelatine plate cultivations show irregularly-shaped colonies, often kidney-shaped, which have a blue colour, especially at the hilus and periphery, as seen with the microscope; later, the colonies assume a pale bluish colour macroscopically. In stroke cultivations it forms an abundant, thick, slimy, greyish layer with irregular edges; in stab cultures a whitish growth, both on the surface and in the depth, forming abundant gas; the surface growth forms a fine interlacing network of rays and concentric circles. On agar it grows fairly well, but is little characteristic; thrives best at a temperature of about 20° C. On potato it forms a thick dirty whitish growth in the needle track, with occasional formation of a few small gas bubbles.

Remarks.—A peculiar odour is evolved from all cultures, but more particularly from gelatine. The odour does not resemble that from sweating feet, which has been remarked by several observers in organisms obtained from between the toes (Thin, Uffreduzzi, Maggiora, etc.). Gas is formed abundantly in the deep layers of gelatine in stab cultures.

II.—*Bacillus Gelatinosus*,

obtained from the skin between the toes.

Morphology.—Fine, slender, actively motile threads, arranged irregularly, but with a tendency to a stellate or parallel arrangement. Preparations from all cultures show a distinct capsule, which is faintly stained by the aniline dyes. The bacilli frequently show a beautifully even beading similar to that seen in tubercle and leprosy; in old cultures there are long leptothrix forms, beaded and with irregular joints, and occasionally showing apparent branching.

Biology.—Gelatine cultivations produced a peculiar colourless, transparent, gelatinous material, which surrounds and is incorporated with the purely chromogenic organism, giving it a coarsely granular or mottled appearance. Plate cultivations: the deep colonies are very small, round or oval, and transparent, and grow very slowly. When they reach the surface they are irregular in shape; with the microscope they are rusty brown in colour, homogeneous, and opaque, with well-defined edges. Stab cultures show a yellow hemispherical growth on the surface, with the peculiar gelatinous appearance, growing very slowly; very little to be seen in the puncture. On agar-agar it grows very sparingly or not at all at a temperature above 28° C. Its growth is similar in every way to the gelatine cultures. Potato cultures are of a beautiful orange-yellow colour, and consist of thickly-set grains, very firm and difficult to break up. Later, the growth resembles a series of very fine, delicate, twisted, and coiled-up threads. On this medium the gelatinous appearance is not produced.

III.—*Bacillus Fluorescens Epidermidis*,

obtained from the tip of the finger after thorough washing and soaking in alcohol absolutum.

Morphology.—Actively motile, straight or curved rods, arranged irregularly; sometimes singly, but mostly end to end in pairs. No spore formation observed.

Biology.—Gelatine cultivations commence to liquefy in about two days without visible growth, nothing being seen but a slightly greenish cloudiness in the channel of liquefaction; the solid gelatine becomes feebly fluorescent and is completely liquefied in seven to ten days; a white flocculent deposit occurs at the bottom. If undisturbed, the liquefied gelatine separates into two layers, an upper green, and a lower colourless one, while a very thin greenish pellicle forms on the surface. Sooner or later the fluid assumes a yellowish tint. Stab cultivations are rather slower in development than the stroke; liquefaction takes place from the surface in the form of saucer-shaped liquefaction, rapidly extending to the sides of the tube, and then spreading downwards. On agar-agar the organism will not grow at blood heat, but at 25° C. forms an abundant whitish fluorescent growth, staining the medium a beautiful pea-green. Potato cultivations are of a dirty cream colour, limited to the needle track, and coarsely granular in appearance, with a dull surface.

Remarks.—This organism resembles in some respects bacillus pyocyaneus *s* (Ernst), bacillus fluorescens liquefaciens (Flügge), and bacillus fluorescens liquefaciens minutissimus (Unna). The question of its complete identity with one of