lated in the child, and from the child returned to a bovine, never produce an eruption of cow-pox.⁶

At present I have in my place Calf iv, inoculated in direct succession from Calf i, and the eruption is to-day (24×5) perfect and typical and active, and shows no sign of dying, but the opposite. And as to the second point, I have also a calf at present which has six fine pocks produced by six insertions of lymph taken from the child, T. A., referred to above. Both the criteria laid down by Bouley, therefore, have no existence. But he is referring especially to the adult ox—which he probably never did variolate—I to the calf, which I and others have successfully variolated.

I think no shadow of doubt can remain in the mind of the reader as to the true vaccinal character of the pocks on the arm of the child I inoculated here from Calf ii, or of the pocks on the arms of the six children inoculated by a man of such experience as Dr. Fischer. Those who are familiar with the experiments of Ceeley and Badcock in this country will recognise that what they demonstrated has once again been proved to be true.

But there will no doubt arise a feeling of wonder at the unhesitating declaration of the Lyons Commission stated above that variolation of the cow only produces variola, or, as stated by one of the most eminent of French veterinarians, M. Bouley, for some time President of the Académie de Médecine (Paris): "La vache inoculée de la variole ne rend pas la vaccine; elle rend ce qu'on lui avait prêté, et en monnaie identique, c'est à dire qu'elle rend la variole."⁷

In Germany the possibility of variolating the calf is recognised by eminent authorities. In this country, where experimental inquiry is unfortunately not much practised, there can hardly be said to be any opinion at all on the subject.

Success in the experiment no doubt largely depends on the taking of the variolous matter on the best day, and on the character of the animal inoculated. Calves seem to be much more susceptible than cows, and no doubt Chauveau's failures are due largely to the fact that he seems to have experimented chiefly, if not entirely, with cows. Everyone is familiar with the fact that the young of man and beast are susceptible to diseases against which the adults are practically proof. Anyhow, it is extraordinary that even to-day he should refuse to attempt to use the calf for variolation experiments, and yet still declare that in inoculating the cow he is repeating the experiments of those who expressly state that their success was obtained with the calf to the exclusion of the cow. It would seem as if this eminent experimenter had determined not to learn from the opponents of his opinion, and that he refuses to admit that in scientific questions "fas est et ab hoste doceri."⁸

The apparently irreconcilable difference between my results and those of the Lyons Commission lies in the fact that I used the calf, not the cow, for my experiments. I have no doubt that herein also lies the secret of the very large proportion of failures experienced by Badcock and others.

⁶ "La variole inoculée du bœuf à l'enfant et rapportée de l'enfant du bœuf ne donne jamais lieu chez ce dernier à une éruption de cow-pox," Bouley, *loc. cit.*

⁷ *Le Progrès en Médecine par l'Expérimentation*, par H. Bouley, Paris, 1882, p. 213.

⁸ It is hardly necessary to say that the variola-vaccine developed in the course of the experiments related above is in no way associated with the calf vaccine—never humanised—which I supply for vaccination. There has never been any association of them whatever.—T. W. H.

LITERARY INTELLIGENCE.—A second edition of Sir Thomas Longmore's *Treatise on Ambulance Transport* (published in 1869) is now in the press. The revision of the work has been entrusted by the author to Surgeon-Captain William A. Morris, with the sanction of the Director-General of the Army Medical Department, upon whose recommendation to the Government the issue of a second edition was ordered. A special chapter on the Convention of Geneva, from the pen of Mr. John Furey, has been introduced, and the history of the British Medical Service, commenced by Sir T. Longmore, has been completed by Brigade-Surgeon-Lieutenant-Colonel W. Johnston, A.M.S. The title of the book has been changed from its original form to *A Manual of Ambulance Transport*, for the somewhat quaint reason that "the word 'Treatise' has fallen into disuse." We can only say with Bardolph that we have heard the word, and we will maintain the word to be a soldier-like word and a word of exceeding good command.

THE DIAGNOSTIC VALUE OF THE EOSINOPHILE LEUCOCYTES IN LEUKÆMIA AND HODGKIN'S DISEASE.

By A. A. KANTHACK, M.B., M.R.C.P.,

John Lucas Walker Student in Pathology, Cambridge University.

EHRLICH and his followers¹ ascribe the greatest importance to an increase in the blood of the eosinophile leucocytes in the diagnosis of leukæmia and Hodgkin's disease. Lately, Professor Dreschfeld,² Janowski,³ and others expressed their doubt as to the significance of these cells in the above diseases, and adding a few observations of my own, made since the beginning of the year, I hope to show that the increase of the eosinophile cells, with or without general leucocytosis, is of absolutely no value in the diagnosis of leukæmia.

1. As Professor Dreschfeld and Janowski state, an increase of eosinophile cells is not found in all cases of leukæmia. In some instances, as in a case examined by me—the only one at my disposal—there is an actual decrease.

2. In chlorosis I found a marked increase on several occasions; however, without general leucocytosis.

3. Canon,⁴ Neusser,⁵ and others,⁶ observed an increase of these cells in the blood of patients suffering from various affections, as asthma, chlorosis, eczema, psoriasis, prurigo, pemphigus, ovarian cysts.

4. In the febrile blood of animals we have both a marked leucocytosis and a great increase of eosinophile cells.⁷ An opportunity of examining hospital patients systematically did not present itself, but I do not doubt that in such fevers as pneumonia, diphtheria, or rheumatic fever, leucocytosis with an increase of the eosinophile cells will also be found at particular stages of the disease. In a case of hip disease with hectic fever and lardaceous liver, and in three cases of septicæmia, I noticed invariably in the morning an increase of these cells with leucocytosis. One case was especially instructive, as the patient was very anæmic after repeated losses of blood, and the hæmoglobin greatly reduced. Leukæmia was altogether excluded, and yet with a general leucocytosis there was a great increase of eosinophile cells. I cannot therefore agree with Janowski, that "the co-existence of a large number of eosinophile cells in the blood with leucocytosis is of a positive value in the diagnosis of leukæmia," though I agree with his further statement that "leucocytosis with an absence of these cells does not exclude the possibility of leukæmia."

The following considerations will show that the eosinophile cell is of no specific importance in leukæmia.

1. Neusser,⁸ Leyden,⁹ and Janowski¹⁰ found large numbers of these cells in gonorrhœal pus, and my own observations on four acute cases confirm these observations.

2. Pus from subcutaneous abscesses of rabbits, dogs, and guinea-pigs often consists almost entirely of eosinophile cells.

3. Pus obtained from cases of purulent ophthalmia, which attacked some of the rabbits kept in a particular cage, also presented a considerable number of such cells.

4. Most specimens of human pus were likewise full of them. Such pus was obtained from two perineal abscesses, a psoas abscess, from a case of suppurative periostitis, of necrosis of the jaw and from several sloughing and granulating wounds.

5. The sputum of patients suffering from asthma,¹¹ phthisis,¹² and bronchitis often contains great numbers of

¹ P. Ehrlich, *Farbenanalytische Untersuchungen zur Histologie und Klinik des Blutes*. Part I.

² Clinical Lecture on Acute Hodgkin's Disease, *BRITISH MEDICAL JOURNAL*, April 30th, 1892.

³ Beitrag zur Kenntniss der Granulationen der weissen Blutkörperchen, *Centralbl. für allgem. Path. und path. Anat.*, iii, No. 11.

⁴ *Deutsche med. Wochenschr.*, 1892, No. 10.

⁵ *Wiener med. Presse*, 1892, Nos. 3, 4, 5.

⁶ Gabritschewski, *Arch. für exp. Pathol. und Pharmacol.*, 1890, page 83.

⁷ Cf. a paper by the author in *BRITISH MEDICAL JOURNAL*, June 18th, 1892.

⁸ *Loc. cit.*

⁹ *Deutsche med. Wochenschr.*, 1892, No. 5.

¹⁰ *Loc. cit.*

¹¹ Gollasch, *Fortschr. d. Med.*, 1889, page 361. Leyden, *Deutsche med. Wochenschr.*, 1891, pages 36 and 33. Weiss, *Wiener med. Presse*, 1891, pages 41 to 44. Neusser, *loc. cit.*

¹² Cf. Janowski, *loc. cit.*

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.

By A. W. MAYO ROBSON, F.R.C.S.ENG.,

Honorary Surgeon Leeds General Infirmary; Professor of Surgery in the Victoria University.

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.*