produces a well marked rise of temperature when injected in animals. We therefore possess some evidence that sympathomimetic drugs have a tendency to increase the temperature. Ephedrine is proved beyond doubt to be a typically sympathomimetic drug. It is therefore intelligible that if ephedrine produces any effect at all on the temperature, it is in increasing it. The experiments mentioned above lead us to the same conclusion. Although ephedrine does not produce any marked effect on the normal temperature, it has no tendency to lower the temperature of febrile rabbits and markedly raises the temperature of animals rendered subnormal by administration of chloral hydrate.

Summary and conclusion.

1. Experiments were conducted on 56 rabbits to determine the effects of ephedrine on the temperature.

2. Normal animals do not show marked variation of temperature after an injection of 2.5 to 10 mg. ephedrine hydrochloride intravenously, or 50 mg. intramuscularly, per kilo. of body weight.

3. Animals rendered febrile by injections of a broth culture of *B. coli communis* show no tendency to regain normal temperature after injections of ephedrine. On the other hand the temperature shows a slight tendency to rise.

4. The temperature of animals lowered by chloral hydrate is restored to normal, often within half an hour, by an injection of ephedrine hydrochloride and sometimes raised above normal.

My thanks are due to Dr. C. Ramamurti, Professor of Bacteriology, for supplying *B. coli* cultures and to Dr. Kameshwar Rao and Mr. Moursund of this department for carrying on the work of taking the temperature of the animals every half hour. But for the steady work of the last two workers, this study would have been very difficult.

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A POSSIBLE PITFALL IN MAKING LEUCOCYTE COUNTS.

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(A case and commentary.)

THE following notes of a case which has features of interest both for pathologists and clinicians, are published to show how easily one may make a serious blunder in a simple examination like a leucocyte count in some cases, unless proper precautions are taken.

Clinical description.—Mrs. A, aged 17, was married two years ago. About a year ago she had an attack of dysentery attended with a little fever and suffered for nearly two months. At this time she began to show early signs of anæmia, marked pallor of the skin without wasting, slight breathlessness on exertion, swelling of the legs and ankles, and a systolic bruit at the apex with some conduction towards the axilla, attended with slight fever which never left her till the end. Later these symptoms became so much aggravated that she felt considerable difficulty in breathing when lying quietly in bed; the whole body including the face and arms was slightly œdematous, the complexion was lemon-yellow and the apex-beat was displaced about an inch from the left midclavicular line.

She collapsed two days after the blood, etc., were examined.

Pathological Notes.—Examination of the stool and urine did not reveal anything abnormal. Blood culture gave a negative result. The routine examination of the blood showed the total count of red blood cells and white blood cells to be apparently 1,250,000 and 60,000 per c.mm. respectively; hæmoglobin 30 per cent.; the differential count gave polymorphonuclears 70 per cent., large mononuclears 3 per cent., lymphocytes 25 per cent., eosinophiles 2 per cent., besides a large number of normoblasts and megaloblasts. At the time of examining the stained blood film I was struck by the fact that leucocytes could hardly be found; there were not more than 2 per field and none at all in some, although I expected many on account of the high leucocytic count, but on the other hand nucleated red blood cells were present, from 5 to 7 per field. The presence of marked leucopænia in the differential count made me wonder whether the high total leucocyte count was due to the inclusion of the nucleated red blood cells at the time of counting.

The fluid used in the total leucocyte count contains acetic acid, gentian violet and distilled water; when this solution is mixed with blood in the correct proportions, it hæmolyses the red blood cells, fixes and stains the nucleated cellular contents of the blood, which are recognized in turn for leucocytes in the counting chamber, since the leucocytes are the only nucleated blood cells under ordinary conditions, as blood-platelets do not come into consideration. If nucleated red blood cells are present, which is quite possible in severe anæmias as in this case, the count of the nucleated blood cells will also include these nucleated red blood cells in addition to the white blood cells and give a very high figure for the total leucocyte count. In order to arrive at the correct figure of the leucocyte count, I examined again 45 fields of the stained blood film and found the proportion of leucocytes to nucleated red blood cells to be

1 : 9; hence the corrected figure for white blood cells which was 60,000 at first sight, came down to 6,000 per c.mm.

Conclusion.—Fortunately such cases are far from being common. No reference has been made to such possible contingencies even in the standard books on hæmatology mentioned below. Whatever the case, one cannot afford to overlook this possibility and the oversight on the part of pathologists may change the whole outlook on the case and lead the clinician to a wrong diagnosis with disastrous results. I can think of no other method which could help us in getting at the correct figure of the leucocyte count where nucleated red blood cells are also present, for the latter behave exactly in the same way as the former in the counting chamber. Thus, if the total leucocyte count were 60,000 and the differential count showed 1 leucocyte to 9 nucleated erythrocytes, the relative proportion would be 1 : 9, thereby indicating the presence of 54,000 nucleated erythrocytes per one cubic millimetre. The corrected figure is obtained by deducting the nucleated red blood cell count from the total count. Hence the corrected figure for the total leucocyte count in this case was 6,000.

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CAUDAL BLOCK.

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SACRAL or caudal block with novocain I have found to be a very useful analgesia. For operations on the genitalia, perineum and anus I have found it to be ideal. Two hours of complete anæsthesia are produced. During and after the operation the patient is capable of taking nourishment. Thus measures to combat shock may be maintained without interruption, and that in a manner most convenient for the physician and acceptable to the patient, that is by the mouth.

I have found it especially useful in cystoscopy of the male. So often these patients are emaciated, and this is frequently due to tuberculosis. They are not fit to receive a general anæsthetic, and particularly one of any duration. Cystoscopy, except in the hands of the very experienced, is often a tedious procedure. The value of cystoscopy does not appeal to the average Indian patient, who has come for treatment, especially if it is combined with any discomfort.

In the case of difficult and painful strictures of the urethra it is invaluable. The surgeon may proceed with due deliberation and care. He is not impelled to hasten by the anæsthetic or the anæsthetist. He is free to develop at leisure his utmost skill and ingenuity—and these cases often require both. If then for any reason one should desire access to the bladder end of the urethra, this may be secured supra-pubically under local anæsthesia. Thus a two hours' procedure will not cause as much damage to the patient's general well-being as ten or fifteen minutes of rushed and unsatisfactory effort under general anæsthesia.

I have long felt that this should be an ideal anæsthesia for normal deliveries (obstetrical). Since in India such cases do not often come the way of a physician of the male species, I have had to wait patiently for my opportunity. Just recently opportunity arrived.

My patient was a European lady in her third labour. The previous two had been more or less prolonged, mainly due to the size of the infants, which ranged between eight and nine pounds. During the latter part of the second stage in the first labour chloroform was used (labour took place while in India; in the second labour ether administered—labour took place when in the U. S. A.). This patient was very much afraid of "twilight sleep" as the term is commonly used, because of its effect on the infant. Hence permission to use caudal block was only given on my assurance that it would in no way affect the infant. A couple of years previously I had been prepared to use this anæsthesia in the case of a European patient, but made the mistake of first rupturing the membranes, with the result that matters proceeded so rapidly that I had no opportunity to give the anæsthesia. In this case on making an internal examination and finding complete cervical dilatation, I performed the caudal block, and then after a few minutes ruptured the membranes between contractions. There was a delay before the next contraction, as is so often the case following the rupture of the membranes. But after that the contractions resumed their former periodicity and force. But the sharp cutting pain that makes women writhe at this stage gradually disappeared, leaving the dull backache with each contraction. Because of this the patient was able to co-operate most efficiently with her abdominal muscles. During former labours she informs me that the attending physician always scolded her for her lack of co-operation. The perineal muscles and cervix were relaxed and insensitive. This permitted me to manually assist in pushing the anterior lip of the cervix over the oncoming occiput, and then to dilatate and iron out the perineum during contractions. This could all be done without any discomfort to