

infants remained completely well and there was no pyuria.

Abbott's observations confirm previous work<sup>3,4</sup> showing that slightly over 1% of normal newborn infants develop symptomless bacteriuria, which would probably undergo spontaneous cure in most cases. Contamination of the external genitalia by faeces may contribute to the development of this condition, though in all large series more males than females have been infected. Possibly the newborn male infant lacks the prostatic secretion which has been shown to have a powerful antibacterial effect.<sup>5</sup> In the premature infant in particular the presence of lactose and glucose in the urine in small quantities may enhance bacterial multiplication. The significance of vesico-ureteric reflux in this age group is difficult to assess. Clearly it may be a factor in the development of bacteriuria, but it is widely held that reflux in the neonatal period is a transient phenomenon of no great significance.

Though Abbott's studies do not suggest that culture of the urine in well, newborn babies should be done as a routine screening procedure, the urine should be examined as part of the investigation of any infant which appears ill for no obvious reason or is not thriving. Usually when bacteriuria is

found in an ill infant pyuria is also present. In this age group a septicaemia, usually due to Gram-negative bacilli, is the primary event, and the pyelonephritis, sometimes accompanied by meningitis, is of haematogenous origin. If bacteriuria of more than  $10^5$  colonies per ml. without pyuria is found in an ill baby the findings should be confirmed by a mid-stream specimen of urine or bladder puncture. If two successive specimens show similar findings treatment should be started for pyelonephritis. An intravenous pyelogram should be done in all infants with pyelonephritis, though the incidence of malformations of the renal tract in this age group is lower than among older children with pyelonephritis.

<sup>1</sup> Kass, E. H., *Transactions of the Association of American Physicians*, 1956, **69**, 56.

<sup>2</sup> Savage, D. C. L., Wilson, M. I., Ross, E. M., and Fee, W. M., *British Medical Journal*, 1969, **3**, 75.

<sup>3</sup> O'Doherty, N. J., in *Urinary Tract Infections: Proceedings of the First National Symposium*, ed. F. O'Grady and W. Brumfitt. London, Oxford University Press, 1968.

<sup>4</sup> Littlewood, J. M., Kite, P., and Kite, B. A., *Archives of Disease in Childhood*, 1969, **44**, 617.

<sup>5</sup> Stamey, T. A., Fain, W. R., Timothy, H. M., and Ching, H. K., in *Urinary Tract Infections: Proceedings of the First National Symposium*, ed. F. O'Grady and W. Brumfitt. London, Oxford University Press, 1968.

## The Hidden Perforating Veins

The veins within the fascial compartment of the lower limbs are principally conduits for carrying blood back to the heart. The superficial limb veins do not contain a very large quantity of blood, and recent work<sup>1</sup> has suggested that one of the main functions of flow through these veins is the control of body temperature.

In a normal person standing still the pressure in the superficial veins in the foot is 120 mm. Hg, but it falls to 30 mm. Hg during exercise.<sup>2,3</sup> This exercise hypotension occurs after each muscle contraction has squeezed the blood out of the deep system towards the heart and the superficial veins have emptied into the deep veins through the perforating veins. The delicate mechanism of blood flow in the superficial veins is totally disrupted if the valves in the veins which connect the superficial and the deep systems become incompetent. The superficial veins then experience periods of extremely high pressure during each calf muscle contraction which is not followed by the normal phase of low pressure. The superficial veins become distended and tortuous, and the obstruction to the venous outflow from the capillaries eventually causes oedema, pigmentation, ulceration, and aching pains, the clinical features of venous stasis. It is generally agreed<sup>4,5</sup> that almost all venous ulcers are associated with incompetent perforating veins, and probably the majority of uncomplicated varicose veins have a similar association, though it should be remembered that the junctions of the long saphenous vein and femoral vein, and the short saphenous vein and popliteal vein, are, physiologically, perforating veins. Incompetence at these sites can have just the same effect as incompetence of the valves of the small connecting veins in the lower thigh and leg, the veins usually associated with the term "perforating veins."

Therefore the logical method of treating varicose veins is to occlude the incompetent connecting veins between the superficial and deep systems and so restore the pressure and flow in the superficial veins to normal.

The problem for the clinician, whatever method he ulti-

mately uses to obstruct the perforating veins, is to find out where they are. In this issue of the *B.M.J.* Mr. K. D. Patil and his colleagues review the existing methods for detecting incompetent perforating veins and describe a new technique (page 195). Their study emphasizes what a number of other workers have found<sup>6-8</sup>—namely, that clinical diagnosis is a very poor guide. At their best our fingers and eyes will detect only 60% of perforating veins, and this deficiency has stimulated the search for new methods of diagnosis. The surgeon who relies solely on physical examination or a knowledge of the standard anatomical description of the sites of the perforating veins will inevitably miss a large number.

We have had one reliable method of diagnosis, phlebography,<sup>8,9</sup> for many years, but this has not been adopted as a common method of investigation because it is time-consuming, sometimes uncomfortable for the patient, occasionally painful, and difficult to interpret. The main disadvantage of phlebography is the difficulty of relating the site of the perforating vein on the two-dimensional radiograph to its true site in the three-dimensional leg.

The detection of incompetent perforating veins by phlebography and the thermographic method described by Patil and colleagues depends on the primary physiological abnormality of varicose veins—namely, the reversed flow of blood from the deep to superficial systems. It is therefore not surprising that both methods are extremely accurate, and the thermographic method has the added advantage of being simple, completely painless, and not too time-consuming. It takes only five minutes to display one incompetent perforating vein, and both legs can be examined in less than an hour, no longer than it takes to obtain a phlebogram.

Because of the simplicity of the test thermographic loca-

<sup>1</sup> Webb-Peploe, M. B., and Shepherd, J. T., *Circulation Research*, 1968, **22**, 737.

<sup>2</sup> Seiro, V., *Acta Chirurgica Scandinavica*, 1937, **80**, 41.

<sup>3</sup> Walker, A. J., and Longland, C. J., *Clinical Science*, 1950, **9**, 101.

<sup>4</sup> Sherman, R. S., *Annals of Surgery*, 1949, **130**, 218.

<sup>5</sup> Halliday, P., *British Journal of Surgery*, 1967, **54**, 248.

<sup>6</sup> Massell, T. B., and Ettinger, J., *Annals of Surgery*, 1948, **127**, 1217.

<sup>7</sup> Rosenberg, N. and Marchese, F. P., *Surgery*, 1963, **53**, 575.

<sup>8</sup> Townsend, J., Jones, H., and Williams, J. E., *British Medical Journal*, 1967, **3**, 583.

<sup>9</sup> Mathieson, F. R., *Acta Chirurgica Scandinavica*, 1959, **117**, 468.

lization of the perforating veins will probably be used more than phlebography, but it is unlikely to be adopted for investigating all varicose veins because, apart from the technical assistance and skill needed, the apparatus is expensive. Until a simple, inexpensive bedside method of detection is devised, thermography is likely to be used in the same way as phlebography, for the difficult recurrent case. But if this addition to our methods of investigation were to be used widely the results of the treatment of varicose veins would be noticeably improved.

## Culdocentesis and Ectopic Pregnancy

Classically, ruptured ectopic pregnancy presents as an acute surgical emergency, and it still contributes to maternal mortality.<sup>1</sup> But a less dramatic clinical picture is more common, though the correct diagnosis can usually be suspected from careful history-taking and examination coupled with a keen awareness of the possibility. The clinical features include a short period of amenorrhoea or a recent abnormal period (though the menstrual history may be normal), lower abdominal pain characteristically spasmodic and severe, tenderness, and a scanty vaginal loss of dark blood. Pelvic examination may elicit considerable and often exquisite pain on moving the cervix or a mass in the posterior or lateral fornices.

In the "chronic" condition associated with tubal abortion or mole, several of these features may be absent and diagnosis may be difficult. Pregnancy tests are not usually helpful, and pelvic examination under anaesthesia and examination of the endometrium for decidual change may give misleading results. Culdocentesis has long been advocated as a means of detecting intraperitoneal haemorrhage, but its popularity seems to have declined in Great Britain because of a reputation for unreliability.<sup>4</sup> But in Lusaka, Zambia, Drs. Cynthia Lucas and A. M. Hassim have found the technique to be of great value, and they report in the *B.M.J.* this week (page 200) their experience with its use in 155 of 199 cases of suspected ectopic pregnancy.

Culdocentesis provided the correct diagnosis in 148 cases (55 negative and 93 positive). There were three false negative results (including two in which the ectopic gestation had not leaked blood into the peritoneal cavity) and four false positive results (two with pelvic infection and two with conditions which required laparotomy in any case). In the remainder culdocentesis was not attempted as the diagnosis was not in doubt. The technique, therefore, achieved a diagnostic accuracy of 93%.

This higher percentage of correct diagnosis than in other series (55%,<sup>2</sup> 72%<sup>4</sup>) Drs. Lucas and Hassim attribute to their more frequent use of the procedure. J. T. Armstrong and colleagues reported a comparable diagnostic accuracy of 89%.<sup>3</sup>

Lucas and Hassim found culdocentesis to be the most important single diagnostic aid in their cases. They usually performed it as a side-ward procedure without an anaesthetic, using a 5-in. (12.5-cm.) size 18 needle inserted into the pouch of Douglas for about 1 in. (2.5 cm.). In Zambia pelvic infection is the most common differential diagnosis of ectopic gestation, but with their technique the authors have avoided the possible risk of perforating a pyosalpinx or adjacent bowel.

The authors do not favour laparoscopy because they find that pelvic adhesions may preclude an adequate view or that the large trocar may damage adherent bowel. A different view seems to be held both in Britain and on the Continent of Europe. P. C. Steptoe<sup>5</sup> considers that the possibility of ectopic gestation is one of the principal indications for laparoscopy and that it may also show other conditions not associated with haemoperitoneum which require laparotomy. H. Frangenheim<sup>6</sup> noted that laparoscopy increased the frequency of diagnosis of intact extrauterine pregnancies from 9 to 23%.

There was a relatively high incidence of acute cases in the Zambian series, and it may be that the cases described by Lucas and Hassim presented, on average, at a later stage of the condition than is usual in Britain. It would be interesting to know the results of laparoscopic examination in a Zambian series similar to those described this week. Though acute pelvic inflammatory disease is often thought to contraindicate laparoscopy, A. Sjövall<sup>7</sup> has used it extensively without complications in suspected acute salpingitis and found that the clinical diagnosis was often incorrect.

Laparoscopy requires an experienced operator and expert general anaesthesia, but it is likely to be of more value than culdocentesis as it can contribute more to the overall management of a particular clinical problem than simply by confirming or refuting the diagnosis of haemoperitoneum. In the developing countries, however, where facilities may be limited and patients may tend to present at an advanced stage of the condition, the simple technique of culdocentesis has obvious advantages and is apparently of great value. Though C. P. Douglas<sup>4</sup> considered that the number of false positive results he obtained in acute salpingitis in Jamaica limited the value of the technique, the excellent results reported by Lucas and Hassim are likely to encourage its wider use for the diagnosis of ectopic pregnancy in similar circumstances.

## Computers for Transplantation

Rejection of transplanted tissue depends on the recognition of the donated tissue by the recipient and its immune destruction. The antigens that are recognized in this process are called histocompatibility factors. They include the substances of the red-blood-cell groups and also glycoproteins present in all nucleated cell membranes but absent from red cells. These glycoproteins are detected in the laboratory by means of agglutination or cytotoxic effects on white blood cells. Antisera are used from patients who have rejected transplants, recipients of multiple blood transfusions, or patients who have become immunized as a result of multiple pregnancies.

Although the definition of histocompatibility antigens is not yet complete, it is clear that in man, as in several other mammalian species, there is one strong histocompatibility

<sup>1</sup> Report on Confidential Enquiries into Maternal Deaths, England and Wales 1964-1966. London, H.M.S.O. 1969.

<sup>2</sup> Bobrow, M. L., and Winkelstein, L. B., *American Journal of Obstetrics and Gynecology*, 1955, 69, 101.

<sup>3</sup> Armstrong, J. T., Wills, S. H., Moore, J., and Lauden, A. E., *American Journal of Obstetrics and Gynecology*, 1959, 77, 364.

<sup>4</sup> Douglas, C. P., *British Medical Journal*, 1963, 2, 838.

<sup>5</sup> Steptoe, P. C., *Laparoscopy in Gynaecology*. Edinburgh, E. and S. Livingstone, 1967.

<sup>6</sup> Frangenheim, H., *Geburtshilfe und Frauenheilkrankene*, 1964, 24, 470.

<sup>7</sup> Sjövall, A., in Steptoe, P. C., *Laparoscopy in Gynaecology*, p. 57. Edinburgh, E. and S. Livingstone, 1967.