CORRESPONDENCE

Straight Endotracheal Connection

Sir,—In the May issue of the British Journal of Anaesthesia Dr. L. Rendell-Baker illustrates a straight endotracheal connection, manufactured by Messrs. Medical and Industrial Equipment Ltd., for use during neurosurgical procedures. He mentions that the idea of a similar connection has probably occurred to others but that no account could be found in the literature, nor did the anaesthetic instrument firms know of one. Messrs. Medical and Industrial Equipment Ltd. recently modified a standard endotracheal suction union to our instructions for this same purpose. We published and illustrated this in January—Ballantine and Jackson (1954).

While we are sorry if the description of our modification did not make its function obvious, we are confident that either of these connections will be of value to the neurosurgical anaesthetist.

ROBERT I. W. BALLANTINE
IAN JACKSON
(St. Bartholomew's Hospital, London)

REFERENCE

The Venous Return

Sir,—In the annotation given in the March number of this journal concerning the above subject (Brit. J. Anaesth., 26, 118), the argument is advanced that the mean aortic pressure is sufficient to return the blood from the entire capillary field to the right heart. This is only partially true.

It was pointed out that organs differed in the nature of their functions: in some, the function was of a more or less continuous nature and in these the venules were not valved; in skeletal muscle, on the other hand, the function varied greatly in degree and, correlated with this, the venules were valved in order to deal with the increased vascularity of active contraction.

The matter might be put in another way. Organs might be described either as encapsuled, where they are confined within restricting fibrous envelopes such as the central nervous system, liver, bone, lung, etc., or as of an elastic nature such as striped muscle and skin that are not so restricted. This structural difference involves the operation of two distinct principles in the return of venous blood to the heart.

The venous return in the first instance depends upon the vis-a-tergo of the cardiac effort about which it may be said —after allowance for “depot function”— that what goes into encapsuled organs must come out at a corresponding rate. This is the principle found in the entire phylum of the Arthropoda in which the exoskeleton is a flexible but inelastic capsule encasing all the contents of the body. Associated with this structure, the circulation is of the “open” type; that is, there are only arteries which distribute blood to every part. There are no veins. The blood is returned from the periphery
to the dorsal pericardial sinus indirectly through the interstitial spaces. The heart, lying within the dorsal sinus, thus receives the blood which it recirculates, and the mean "aortic" pressure suffices for this (Curtis and Guthrie, 1947).

The second principle is found in the more elastic bodies of the vertebrates among the tissues of which, some circulatory energy is inevitably lost, and where such loss occurs, it is compensated by the addition of extra vascular power in the form of valved venules. Such power is further adjusted to meet resistance as in the portal system; and the pulmonary system requires a special heart with its valves to overcome the capillary resistance in the lungs.

In view of these differences of vascular principle, the interpretation of the figures given in the annotation, and also those based upon the findings of Pappenheimer and Soto-Rivera (1948), require some amendment because no account has been taken of the venular activity in the great muscular mass of the body. The valved venules are there, and their activity in providing a major contribution to the return of blood to the heart should not be ignored, even if it cannot be completely separated from the attenuated cardiac effort.

W. B. Primrose
(Glasgow Royal Infirmary)

REFERENCES