is now heavily annotated and one hopes that other careful, critical readers will do the same. To allow so much fiction to pass as science is a pity and it should be allowed to pass uncensored. The references are useful for the uninitiated.

JB CAVANAGH

Cerebral Microcirculation and Metabolism. Edited by J Cervos-Navarro and Emmanuel Fritschka. (Pp 450; \$67.32.) New York: Raven Press, 1981.

This book contains the edited proceedings of Internation Erwinriesch Symposium on Cerebral Microcirculation and Metabolism held at Freie Universität, Berlin September 1979. The first section deals with morphological aspects of the cerebral microcirculation and reflects the principal interests of the organisers. Modern morphometric techniques applied to cerebral arterial territories are supplemented by studies of blood-brain-barrier function to vaso-active substances.

The second section is devoted to the regulation of cerebral blood flow and to the role of adenosine and neuropeptides present in perivascular nerve endings. The substances appear to modify local blood flow either by a direct action on cerebral blood vessels or by an action on cerebral metabolism mediated via the pituitary. Various transmitter systems, dopamine, serotonin and GABA have now been shown to be present in vascular nerves.

The third section considers various experimental models used to study the relationship between hypertension, ischaemia and oedema and presents new evidence on the role of neuro-endocrine mechanisms in maintaining extracellular fluid balance. Bioluminescence techniques notably by Hossmann have provided insight into regional biochemical changes after middle cerebral artery occlusion. The ¹⁴C dexoglyucose method pioneered by Sokolof has been used to illustrate the interplay of acidosis and glucose utilisation.

The final section concerns clinical vascular disorders and includes a wide variety of observations notably on the morphological and physiological changes in hypovolaemia, vascular spasm and subarachnoid

haemorrhage, cerebral infarction and hypertension. Therapy by vasodilatation and by artificial hypertension is briefly mentioned.

The presentation is excellent with many high quality electron micrographs and the delay in publication (under two years) is short enough to make this an invaluable source of reference to recent workers in the field.

RW ROSS RUSSELL

Phantom and Stump Pain. Edited by J Siegfried and M Zimmermann. (Pp 185; DM68, \$31.70.) Berlin: Springer Verlag, 1981

This book contains many useful contributions. Narakas reports his results of treating 638 patients with traction and/or crush injuries of the brachial plexus over a period of 15 years. Of these patients, 298 were treated surgically. Pain was an important feature in 72% of them and severe pain in 34%; surprisingly, 28% of the patients with avulsions had minimal or no pain. Any theory that deafferentiation causes pain must take this figure into account. The surgery for which Narakas is famous consists of microsurgical reconstructive procedures, which include external and fascicular neurolysis, excision of nervous tissue leaving gaps which are bridged by autologous grafts, and making connections between avulsed nerves and neighbouring stumps of extra-foraminally ruptured nerves or making use of nerves of lesser importance which are divided and moved to the trunk to be repaired. The nerve transfer is mostly done using intercostal nerves. By-pass nerve transfers and autologous grafting relieve the pain when it is not very severe. Narakas concludes from his great experience that merely freeing scar tissue compressing nerves improves moderate and severe pain, even when this pain has been there for years. This is an important paper, and anyone who treats these patients should study and know it.

Siegfried and Cetinalp contribute another important paper on neurosurgical methods of treating phantom limb pain. Their table 2 presents a large collection of the results of treating phantom limb pain by transcutaneous nerve stimulation, implanted stimulation of the spinal cord, implanted stimulation of thalamic sensory nuclei, sympathetic blocks, dorsal root

entry zone lesions, antero-lateral cordotomy and thalamotomies. Krainick and Thoden review their own results over a period of 10 years of using implants for spinal cord stimulation in 84 patients, and also 140 patients with post-amputation pain from a combined European study. There was complete relief or much improvement in 67% but this had fallen to 25% after 5 years.

Mundinger and Neumüller report their results of treating 75 patients with phantom limb pain either by transcutaneous nerve stimulation or else by implanted stimulation of the medial lemniscus before it enters the thalamus, deep to the superior colliculus. They use what they call programmed stimulation. The essential feature is that the parameters of stimulation can be changed continually. They consider that the patient's ability to change the frequency of impulses and to give brief periods of stimulation is important. This kind of stimulation was positively pleasant. They obtained more than 50% reduction of pain in 13/14 patients. There is an excellent paper by Berger and Gerstenbrand on phantom illusions or sensations following spinal cord transection. A few of the patients had illusions of position of the lower limbs which corresponded to the position of the limbs at the time of injury. Surprisingly, 7/12 patients had the illusion that they could move their digits; some had the feeling that they could change the position of the limbs just as have patients with brachial plexus amputations of limbs. Samii reports his own operation for amputation pain, which consists of removing the neuroma and joining up individual fascicles of the nerve by grafting a U between the two ends, so that each fascicle ends up by forming a U. Although fibres will continue to regenerate in both limbs of the U, Samii reports that the neuroma was small or absent. In 10/19 patients, the pain was totally relieved; in a further 4, there was only slight pain.

There are two papers on phantom tooth pain, a kind of painful phantom that is often forgotten. There is an important paper reporting recent work by Jänig and Blumberg on electrical coupling (cross talk) between retrograde sprouting fibres and descending fibres and on reflex activity of sympathetic fibres in neuromata and in adjacent skin and muscles. There is also an excellent paper by Wall considering the origin of pain following amputations. Altogether this book contains a lot of useful information that could not easily be found elsewhere.

PW NATHAN