endorses the features seen in some boxers of parkinsonism, ataxia of cerebellar type, and patchy dementia sometimes accompanied by fits and ultimately by incontinence and apraxia. These signs may occur after a professional boxer has retired or during his active career. Since the Royal College of Physicians' report of brain damage in 37 of 224 ex-professional boxers,¹ there has been clear evidence of more subtle but equally threatening deterioration of higher mental function and of cerebral atrophy shown on computed tomography in boxers early in their careers and in amateurs.

That repeated minor or major trauma is causal in these patients can hardly be doubted. Apart from acute haemorrhage and the rare fatal fights, the chronic ("punch drunk") syndrome exhibits characteristic neuropathology: (1) rupture of the septum pellucidum; (2) infarcts and gliotic scars in the cortex and cerebellum; (3) excessive senile plaques and especially neurofibrillary tangles in the cortex; and (4) degenerative changes in the substantia nigra. The clinicopathological correlation is of a high order.

The practical problem is what action to take. The BMA report concludes: "It is doubtful whether the participants or others involved in the sport fully appreciate the risks." What is of great concern is that young boxers may be *incapable* of appreciating their early symptoms because of brain damage already sustained. If so, would a young boxer be legally competent to make a decision to continue to box? Or would he later have a justifiable legal suit against his manager or against the Boxing Board of Control? Can it be argued that when he starts his career he knows of the risks he will take and that brain damaged or not he is responsible for his own fate? All nice points for the law but also cause for medical concern.

The BMA report probably wisely makes no definite recommendations—for bans and censorship are as abhorrent as they are self defeating. What is desirable is closer scrutiny and frequent neurological assessment, supplemented by computed tomography, in all professional boxers and in those amateurs whose careers last for more than a brief time. Such assessment should be independent.

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¹ Royal College of Physicians of London. *Report on the medical aspects of boxing*. London: RCP, 1969.

Where's the block?

SIR,—The gap between the rates of pacemaker implantation in the United States and Britain (10 March, p 737) is not necessarily evidence of failure to develop services here. It might be a product of overusage there. In the United States there is a widespread belief in the ability of propranolol, in a dose of 180-240 mg daily, to reduce mortality after cardiac infarction.^{1 2} This dose is an adequate cause of the "hard" and the "soft" "indicators for pacemaking" in many patients, and so it is not surprising that drugs may contribute to bradycardia in up to 40% of candidates for pacemakers in at least one American hospital. In Britain, where we may be more conservative, iatrogenic brady-

cardia appeared to be responsible for only 22% of the referrals to the Devon Heart Block and Bradycardia Survey.³ I do not like the suggestions that without further investigation we should expand the pacemaker industry to counter an abuse of the pharmaceutical industry.

Furthermore, I am aware of the charge that some American colleagues resort to pacemaker implantation in cases where we might be less aggressive—for example, in the transient conduction defects of acute myocardial infarction, in "bradycardia" syndrome without syncope, and in right bundle branch block with left anterior hemiblock (Dr H J L Marriott, personal communication), and we may not be in error.

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¹ Shand DG. Beta-adrenergic blocking drugs after acute myocardial infarction. *Mod Concepts Cardiovasc Dis* 1982;**51**:103-6.

² Beta-Blocker Heart Attack Trial Research Group. A randomised trial of propranolol in patients with acute myocardial infarction. I. Mortality results. *JAMA* 1982;**247**:1707-14.

³ Shaw DB, Evans RC. Chronic heart block and sinoatrial disorder. *J Roy Coll Physicians Lond* 1981;**15**:179-82.

SIR,—Dr A F Rickards declares that "the British patient with cardiovascular disease is not well served by the medical profession." That may be so, but I doubt that "audit of pacing practice leads to [this] inescapable conclusion."

While the implantation rate for pacemakers in Britain is undeniably lower than in some other developed countries, what evidence is there to show that all recipients in these countries are living longer—and, for that matter, staying healthier—than their equivalents in Britain who are denied pacing?

Dr Rickards also states that "no relation exists between implant rates and physician fee for service in North America. . . ." Is this really so? Does this take into account Minerva's report of congressional inquiries into bribes of around \$300 from salesmen to encourage surgeons to choose a particular pacemaker? Who pays the doctor's fee? The patient, Medicare, the manufacturer—or all three?

By all means let us search for reasons why the death rate from coronary artery disease in Britain is not showing the same fall as in the United States. But to suggest—as Dr Rickards does—that it is due to there being fewer cardiologists per head is a giant leap. Or is it a whopper?

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Assessment of a general practitioner accident service

SIR,—The Mid-Anglia General Practitioner Accident Service immediate care scheme analysed by Mr Paul P Silverston (3 March, p 690) is well known for its innovation and enthusiasm, but the blanket call out scheme is highly controversial. Unfortunately, although the severity of injuries was classified, these data are not included. We are told that only 142 out of 1515 patients required an intravenous infusion and that only 63 patients had any airways obstruction. This suggests that well

under 10% of patients benefited from medical attention on site.

Mr Silverston implies that the only alternative in rural districts is to wait 30 minutes for an ambulance crew to arrive and assess the need for medical assistance. This ignores evidence from Seattle and other North American cities where emergency calls are answered by paramedics who can question the caller about the patient. Combined with the general population being trained in basic resuscitation this policy means that an accurate response can be made to a particular patient's needs.

Secondly, Mr Silverstone claims that many calls are required for reasons of efficiency. The East Birmingham Hospital scheme, which answered about one call a week, experienced only one delay in over a year, and even then the delay was due to an epidemic of influenza.

But most fundamentally the paper fails to make any contribution to the central question of whether immediate care reduces mortality and morbidity. This is sad when other authors have suggested methods of analysis and used them to prove the benefits of immediate care (paper presented at sixth European congress of anaesthesiology, 1982).¹ The paucity of scientific data in Britain is the main reason behind the resistance of doctors, the ambulance service, and the DHSS towards setting up a national network of immediate care. The result is that we must continue to witness needless death and suffering in the community.

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¹ Dooley R, Lucas F. The evaluation of immediate care. *Ann R Coll Surg Engl* 1978;**60**:451-6.

Paramedics in the United Kingdom?

SIR,—We wholeheartedly endorse Dr Redmond's views and recommendations on improving coronary care outside hospital (25 February, p 622).

On the subject of injury, injured patients with an injury severity score greater than 10 presenting to this teaching hospital and designated accident centre over the past seven years account for 0.18% of all accident and emergency attenders. Our ambulance services operate a "swoop and scoop" policy with no extended training. These numbers hardly allow junior staff, who regrettably still bear the brunt of resuscitating and treating these patients, to become competent, never mind experienced, in trauma care. Older hands, despite best intentions, soon become rusty.

Merely because these patients are few and far between efforts to improve their care should not be abandoned. Trauma departments will have to be rationalised in the big cities despite fierce resistance from interests that see the loss of accident centre designation as the first step along the path to closure. Doctors are not the only ones scared by the prospect of change: ambulance staff are ambivalent about extended training and some are fiercely resistant. Their fear is understandably born out of the realisation that they would not meet the rigours of extended training.

We suspect that acute services will show little improvement in the years ahead. Only time will tell whether the comparatively recent development of establishing con-