Correspondence

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Intensive Care and the Anaesthetist

SIR,—Professor W. W. Mushin and Dr. J. N. Lunn (14 June, p. 683) seem over-concerned that many young anaesthetists are spending too much of their time in intensive care. I find it difficult to accept their reasoning, as although a considerable number of units are administered by anaesthetists few claim more than one or two sessions for their efforts. The number of anaesthetists devoting more than five sessions to intensive care must be very small, and these are likely to remain limited to undergraduate or post-graduate teaching hospitals with the full range of surgical and medical specialties. There are anaesthetists, both young and old, who prefer not to become involved in this type of work, but there is no doubt that many young doctors with good academic backgrounds are attracted into anaesthesia by the prospect of working in intensive care as well as the operating-theatre.

I agree that intensive care involves no new disease processes, but it does involve new methods of treatment, and, much more important, new attitudes to clinical and administrative management. If it is accepted that the experience, skill, and knowledge of anaesthetists qualify them to fill vital roles in intensive care more than any other single specialty, the next logical step is for an anaesthetist with a special interest to manage the intensive care unit. Some of us are enthusiasts and quite prepared to accept this burden without neglecting our other duties, nor do we believe the responsibility for individual patients should be removed from the consultant under whom they were admitted.—I am, etc.,

R. D. MARSHALL.

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SIR,—I was interested to see that Professor W. W. Mushin and Dr. J. N. Lunn (14 June, p. 683) express the view that anaesthetists should not be in administrative and clinical charge of intensive care units but should be called upon to use their expertise when a particular problem requires their help.

I have shown that in an intensive care unit taking all types of cases needing life-supporting nursing and the machines of modern medical technology, 41% of the cases come into the province of general medicine.¹ While medicine becomes more departmentalized the general physician should remain at least *au fait* with current knowledge of supportive therapy in the dangerously ill, and should not need to be advised on basic matters of fluid balance by an anaesthetist or respiratory failure by a chest physician. To have to hand over the care of the patient to others when they become seriously ill must surely lead one to ask what the proper function of the physician is.

A small intensive care unit such as there has been at Kettering for the past six and a half years functions well with a physician in administrative charge, the clinical control of patients remaining in the hands of those consultants who admit patients to the unit. The nurses are clear who is in clinical charge of patients, and have the benefit of working under more than one consultant. They can turn to the physician in charge for any help in matters of equipment, organization, nursing shortage, and, in particular, training.

Larger units may need to be under the control both clinically and administratively of one person and his team. The French, with their sense of realism, entitle him *physicien réanimateur*; meanwhile physicians

of today may need to reanimate themselves in order to remain in clinical control of their patients.—I am, etc.,

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REFERENCE

- 1 Crockett, G. S., and Barr, A., *British Medical Journal*, 1965, 2, 1173.

Simplified Scoring System for Newborn

SIR,—Routine Apgar scoring has become current practice in many obstetrical units.¹ While the one-minute score is valuable in determining those infants which need immediate attention, the five-minute score is better in deciding which infants may be in danger of developing neurological complications or of dying in the neonatal period. The association between Apgar scoring and neonatal mortality becomes stronger when birth weight is taken into consideration, as Drage and Berendes have shown.²

We wish to suggest an alternative scoring system, to be called the ABC System. Interest is concerned with three vital functions of the newborn infant: A—Activity, B—Breathing, and C—Circulation. Scoring on a 0, 1, 2 basis, 0 indicates complete absence of activity, breathing, and circulation, while 2 indicates full satisfactory function. The intermediate grade is designated 1. The face is preferred as the site for observation of colour, as many babies who are otherwise normal have some persistence of peripheral cyanosis.

In a limited number of babies examined, Apgar and ABC total scores have been compared and a close correlation exists between the two methods, both at 1 minute ($r=0.3963$,

	0	1	2
A—Activity	No active movements	Some movement but sleepy and sluggish	Good active movements
B—Breathing	No spontaneous breathing	Unsatisfactory breathing—for example, gasping, jerky, irregular	Unrestricted rhythmical sustained breathing
C—Circulation	No heart action	Heart rate below 100. Facial cyanosis or pallor	Heart rate above 100. No facial cyanosis

D.F.=114, $0.001 > P$) and at 5 minutes after delivery ($r=0.2702$, D.F.=129, $0.01 > P > 0.001$). However, the ABC system is probably more valuable when expressed as individual numerals, rather than as a cumulative total score. If, for example, one describes a baby at one minute as 111 and at five minutes as 122, this conveys a better clinical picture.

Some nurses who had been trained in its use expressed a preference for the Apgar scoring system, but at sister and medical staff levels there was a strong preference for the ABC system in that it was easily and quickly determined and gave a clearer and more accurate clinical picture.

While admitting the excellence of the Apgar method,³ we have been concerned by the wide variations in scoring which can

occur, even in the hands of trained nursing and medical personnel. The simplified ABC system here described was devised in the hope that it will minimize observer error, lead to more consistent scoring, and, if results are expressed by the three numeral method, give a better indication of the clinical condition of the newborn baby.—We are, etc.,

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REFERENCES

- 1 Drage, J. S., Kennedy, C., and Schwarz, B. K., *Obstetrics and Gynecology*, 1964, 24, 222.
- 2 Drage, J. S., and Berendes, H., *Pediatric Clinics of North America*, 1966, 13, 635.
- 3 Apgar, V., *Pediatric Clinics of North America*, 1966, 13, 645.

sary exposure to radiation, it could be argued that your correspondents have considerably overstated the hazard associated with leaching radium from the apparatus.

The writers relate the total amount of radium leached from the source at, presumably, a constant rate over the period of at least 20 years since the apparatus had been used, to the maximum permissible body burden for radium. They state: "It thus appears that over 3 μCi had become detached from the main source and might well have been ingested had the apparatus remained in use. This is 50 times the permissible body-burden of radium."

The value for the maximum permissible body burden of radium (namely, $0.06 \mu\text{Ci}$) used by the writers is, in fact, wrong; it is quoted incorrectly in the Ministry of Health Code of Practice¹ and should be $0.1 \mu\text{Ci}$ according to the Recommendations of the International Commission on Radiological Protection (I.C.R.P.).² More important, however, this value refers to the maximum permissible burden of radium fixed in the skeleton, assuming a lifetime exposure of 50 years to this burden. When radium is ingested, only a fraction of the amount taken in is absorbed into the blood, and only a fraction of this is ultimately fixed in the skeleton. A more appropriate parameter to use is the maximum permissible concentration of radium in drinking-water, MPC_w. If one assumes that the radium is ingested in a completely soluble form, the value of MPC_w currently recommended by I.C.R.P.² for an occupationally exposed person drinking 2,200 ml. per day for 365 days in the year is $10^{-7} \mu\text{Ci/ml}$. This value is based on the assumption that the retention of radium in bone may be described by a single exponential function of time. There is evidence, however, that the retention of radium in the body may be better described by a power function of time.^{3,4} Recognizing this fact, a special subcommittee of I.C.R.P.² suggests that the MPC_w may be increased by a factor of 10 to $10^{-6} \mu\text{Ci/ml}$, although this figure was not

to be considered as a recommended value at the time of the report—namely, 1959. These values of MPC_w correspond to total intakes over 20 years of $1.6 \mu\text{Ci}$ and $16 \mu\text{Ci}$ respectively. Accordingly, the amount of radium which might have been ingested had the emanator remained in continual use would therefore have been from 2 to 0.2 times the chosen maximum permissible amount in drinking-water for a radiation worker.

In fact, the radium may well have been in an insoluble form, in which case the appropriate value of MPC_w is $3 \times 10^{-4} \mu\text{Ci/ml}$, determined by considering the dose rate received by the lower large intestine. The corresponding total intake of radium over 20 years is then $4,800 \mu\text{Ci}$, which is 1,600 times greater than the amount available from the emanator.—I am, etc.,

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REFERENCES

- 1 *Code of Practice for the Protection of Persons Against Ionizing Radiations Arising from Medical and Dental Use*, Ministry of Health, 1964, p. 96. London, H.M.S.O.
- 2 International Commission on Radiological Protection, Publication 2, *Report of Committee II on Permissible Dose for Internal Radiation*, 1959, pp. 77, 38. London, Pergamon Press.
- 3 Norris, W. P., Speckman, T. W., and Gustafson, F. F., *American Journal of Roentgenology*, 1955, 73, 785.
- 4 Finkel, A. J., Miller, C. E., and Hasterlik, R. J., *Argonne National Laboratory Report 7461*, 1968. U.S. Department of Commerce.

Radiology's New Chance

SIR,—Dr. R. G. Grainger referred in his letter (14 June, p. 692) first to the need for academic recognition of radiology, and then to the gloomy prospects of recruiting or retaining the services of good technical staff. It is the latter subject which I wish to emphasize.

The new rates of pay announced by the Department of Health in Advance Letter P.T.A. 1/69 (Whitley Council P.T.A. 145, when available) are likely to cause much anguish among those who have been in radiography for several years, for reasons set out below.

There is marked discrepancy in the awards to different grades, the higher grades receiving a very meagre increase—particularly the senior radiographers. The teachers have come off relatively well and their rates of pay are only a few pounds (often only £2 or £3 per annum) behind a superintendent III. Teachers carry responsibility in no way comparable to that of a grade III superintendent, who has the running of a large department including a large staff, expensive equipment, the supervision of patients, organization of work, management of relations with consultants and ward and theatre nursing staff, and generally supervising the department under the direction of the consultant in charge. The varied duties, cares, responsibilities, and wide technical knowledge often applied under critical situations mean that the superintendents of all grades should be rewarded much more generously than teachers on whom far less responsibility and stress devolves.

The problem in radiography is to make it a more worthwhile career, but is it likely that this will be achieved if the margin between basic grade and senior radiographers

Oxytocic Drugs

SIR,—In the "Today's Drugs" article (7 June, p. 619) on drugs acting on the uterus during labour, the writer states in his second paragraph, "but there are no drugs which can safely be used to achieve uterine relaxation, since those available at present are either ineffective or potentially dangerous."

During 1929–30 Professor J. H. Burn and I obtained graphic records of the action of many drugs on the parturient uterus by means of a small intrauterine balloon. Apart from the partial inhibitory influence of chloroform and ether we found that hypodermic injection of adrenaline (1 in 1,000) arrested entirely all uterine contractions, shown by a flat base tone, for 15 minutes. Thereafter contractions were slowly and gradually resumed. With this observation we expected we had the answer to the treatment of continuous tonic contraction due to neglected obstructed labour. Not an uncommon obstetric disaster in those days.

The next patient admitted to Queen Charlotte's Hospital with tonic contraction was hopefully given an injection of adrenaline. There was no effect. One or other of my erstwhile colleagues may be able to explain this apparent anomaly by more recent knowledge of the pathology of tonic uterine contraction, though very few in Britain can have been called upon to treat this dangerous emergency.—I am, etc.,

ALECK W. BOURNE.

Ashted, Surrey.

Exposure to Radiation

SIR,—In a recent article (3 May, p. 305) your contributors describe a radium vita emanator and make an estimation of the radiation hazard due to the long-term ingestion of radon solution and the possible ingestion of radium salts leached from the apparatus. While I agree with the information given about the hazard from radon and with the sentiments expressed concerning unneces-