THE ENIGMA OF THE MISSED SEGMENT

SIR:

Re: *The enigma of the missed segment*

The interesting study reported by De Campo and colleagues[1] lead them to a conclusion with which I take issue, namely that the S1 root is that which is involved in the missed segment syndrome. I have for long been puzzled to know why Bonica[2] identified failure completely to block this root as being the most frequent cause of the syndrome, and the investigation by De Campo, *et al.* appears to provide a logical explanation. However, my reluctance to accept the conclusion is based upon the following considerations:

(i) In our clinical experience, contrary to the observations of De Campo, *et al.*, it is frequently possible to define an area of absence of insensitivity to prinprick coincidental with the characteristic oval-shaped missed segment "patch" in the groin. At the same time I admit that we have not specifically sought for failure to block S1, but will certainly do so in the future.

(ii) No explanation has been offered as to why S1 should be involved in the first place. As is well known, painful stimuli from the uterus are transmitted via roots T11/12 (plus involvement of T10 and L1), and from the lower birth canal via S2, 3 and 4. The low back pain characteristic of a proportion of labours doubtless involves fibres travelling via the lower lumbar and upper sacral roots. The latter pain can on occasion be very difficult to abolish, or even to diminish, with an epidural, but I contend that, although the S1 root is implicated, severe low back pain in labour is rarely accompanied by the missed segment syndrome.

(iii) Pursuing this line of reasoning, it is difficult to understand why, if the missed segment syndrome represents "a referred pain directly related to the lack of penetration of anaesthetic solutions into the first sacral segments" the mother does not also complain of pain in the back of the thigh and calf, either unilateral of bilateral, with each contraction.

In summary, I believe that the point of origin of the stimuli which De Campo et al suggest traverse the S1 root has not been satisfactorily defined.

May I incidentally record that in an analysis of our first ten thousand epidurals for labour, carried out some years ago, and including the initial series reported by Ducrow,[3] the percentage incidence of missed segment per labour (13.5 per cent) was much greater than that reported by Ducrow (6.7 per cent). It was reported on the left side (4.3 per cent) almost as frequently as on the right (4.8 per cent), and was rather less frequently bilateral (3.5 per cent). The local anaesthetic used was invariably bupivacaine, and the relationship between the characteristic of the solution and the incidence of missed segments provides an interesting contrast with the data reported by De Campo, *et al.*:

	Incidence of missed segment per administered top-up (%)
0.25% plain	11.05
0.375% plain	10.66
0.5% plain	9.37
0.25% plus adrenaline	22.92
0.5% plus adrenaline	10.94

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ANAESTHESIA RECRUITMENT: OPTIMISM REVIEWED

SIR:

In a recent Letter to the Editor of the Journal, Moffitt and Graves[1] express a degree of optimism over "renewed interest" in the specialty of anaesthesia by graduates of Canadian medical

TABLE I

ANESTHESIA RESIDENTS: CANADA: AT 30 NOVEMBER 1979

				School of graduation			Status		
Level	Total	Men	Women	Canada	Other Cat. #1	Other	Can.	L.I.	Emp visa
R 1	67	46	21	55	6	6	56	9	2
R 2	98	69	29	78	11	9	80	13	5
R 3	82	63	19	64	12	6	65	10	7
R 4	73	48	25	42	16	15	49	10	14
Total	320	226	94	239	45	36	250	42	28
%	100	70.6	29.4	74.7	14.1	11.2	78.1	13.1	8.8

Other cat. #1 = U.K., Eire, U.S.A., S. Africa, Australasia.

TABLE II

ANESTHESIA RESIDENTS: CANADA: 1962–1979

					School of graduation			
Year	Total	Men	Women	% Women	Canada	% Canada	Other Cat. #1	Other
1962	206	174	32	15.5	109	53.0	27	70
1965	270	229	41	15.2	139	51.5	38	93
1970	266	207	59	22.2	110	41.4	46	70
1975	302	233	69	22.9	149	49.3	61	92
1979	320	226	94	29.4	239	74.7	45	36

Other cat. #1 = U.K., Eire, U.S.A., S. Africa, Australasia.

schools, and imply that relief of the chronic manpower shortage is in sight. They are to be congratulated on their perceptive observation, but I suggest that their prediction may be more likened to the relief of General Gordon at Khartoum. At the risk of being labelled as both pessimistic and chauvinistic, I should like to review their data and other sources, and perhaps temper their enthusiasm.

Table I displays the number of career bound anaesthesia residents by level of training, school of graduation and civil status, enrolled in the programmes of the 16 Canadian medical schools as at November 30, 1979. There are (were) some 16 additional "fellows', not included in the count as most were in Canada for advanced training on employment visas, for one year, and are presumed to be returning to their home countries. With the current immigration restrictions one could also question the inclusion of 28 residents also on employment visas, so that the effective pool of future anaesthetists was actually only 292. Be as that may, it would seem that the number of provincially funded positions will remain relatively constant in future, because of financial constraints, and housestaff stipends being what they are. Any future increase in anaesthesia trainees will probably be achieved only at the expense of other specialty programmes. The percentage of residents who are graduates of Canadian medical schools varies between programmes from 44 to 100 per cent, and has always been consistently high in the French speaking programmes.

Table II is a condensation of data presented by Moffitt and Graves, provided through an anaesthesia resident registry established by Dr. H.B. Graves of Vancouver in 1962, for the Education Committee of the Canadian Anaesthetists' Society and the then 12 Department Heads. These data, in the early years of collection, were thought to have erred on the conservative or low side, as they didn't always include residents funded from sources other than through Departments of Anaesthesia (e.g. while seconded to Medicine). The 1979 figures, as in Table I, were collected by this writer in preparing for a Conference of Specialties sponsored by the Royal College, held in Ottawa in April, 1980.

The number of residents in training has in-

TABLE III

ANESTHESIA RESIDENT ENROLMENT CHANGES 1965–1979

	Men	Women	Total
1965	229	41	270
1979	226	94	320
	−3	+53	+50

% of increase between 1965 and 1979: −6%, 106%.

TABLE IV

GRADUATES OF CANADIAN MEDICAL SCHOOLS BY SEX

	Men	Women	Total	% Women
1961	773	66	839	7.8
1964	709	77	786	9.8
1969	885	134	1,019	13.1
1974	1,260	307	1,567	19.5
1978	1,250	516	1,766	29.2

creased from 206 (lower than actual) to 320, with the number of graduates of Canadian medical schools increasing from 109 to 239, and the number of men from 174 to 226. Note that there were 229 men residents in 1965 (1965–66 year), distributed amongst 12 anaesthesia programmes in contrast to 226 in 1979 (1979–80 year) in 16 programmes. Programmes at Memorial, Sherbrooke, McMaster and Calgary came on stream in the early 1970s. This could suggest that anaesthesia recruitment was as good if not better in the 1960s as in the 1970s.

Changes in the enrolment pattern become more startling when viewed in terms of sex, between 1965 and 1979, as shown in Table III.

The changing characteristics in anaesthesia resident enrolment are now mirroring those that have occurred in Canadian medical school undergraduate enrolment, and in turn, graduate output as shown in Table IV using the years just preceding those in Table II. These years represent the post-intern potential pool for post-graduate residency training for the following year or years.

The graduate output of Canadian medical schools has more than doubled since 1961 and has now plateaued. Women graduates have increased from 8 to 29 per cent of the 1978 output year, which is almost an 800 per cent increase in actual numbers over that of 1961. The enrolment of women in the first year of one school was 57 per cent for the 1979–80 year and four others are over 40 per cent. It is predicted[2] that with the current trend in undergraduate enrolment, there will be fewer men graduating from Canadian schools by 1988, than there were in 1964! These facts surely have important implications for future anaesthesia recruitment and manpower (or womanpower) requirements.

The members of the Working Party in Anaesthesia (I.M. MacKay, I.E. Purkis, G.M. Wyant, J.E. Wynands, S.L. Vandewater) when preparing their report and recommendations[3] to the National Physician Manpower Committee, were conscious of the implications of the medical school enrolment trends and pending immigration restrictions and thus defined the manpower requirements on work-load principles and effective full-time practising anaesthetists. To meet the manpower requirement for certificated specialists in anaesthesia, and for Canada to be self sufficient, we estimated that not less than four per cent of the graduates of Canadian medical schools should enter the specialty.

Although the recent changes in anaesthesia resident enrolment appear encouraging, they must be viewed in respect to the growth of the pool of graduates of Canadian medical schools, as well as the increase in population. In this light, not much has changed except the sex distribution of residents in training. The shortage of specialist anaesthetists as defined by the Working Party over six years ago is of the same magnitude today.

In a recent report, Mr. W.A. Mennie[4] of National Health and Welfare Statistics Branch showed that by including "non specialist" physician anaesthetists (those devoting more than 50 per cent of professional time to anaesthesia) there is a current balance, in terms of the recommendations of the National Physician Manpower Committee report of 1975, i.e., one anaesthetist per 13,742 population.

Further, Mr. T.J. Giles of the Royal College[5] presented data at the Conference of Specialties which shows a significant drop in the percentage of graduates of Canadian medical schools exhibiting documented interest in Royal College specialty training from the graduating years 1966 to 1975, from 50.4 to 35.6 per cent. During this period there were 11,771 graduates; 3,855 have become certified in a speciality, of which some six per cent are anaesthetists. Thus under two per cent of graduates of Canadian medical schools 1966–75 have become certificated in Anaesthesia.

All of the above may not be cause for pessimism, but is at least disconcerting. Perhaps the shortage of manpower is more academic than real; perhaps Moffitt and Graves are correct in their prediction; or perhaps there has to be another answer to the provision of specialist anaesthesia health care.

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