Tribute to Alexander I. Arutiunov

To THE EDITOR: In the April Journal of Neurosurgery there is an article by Alexander Ivanovitch Arutiunov and a notice concerning his 70th birthday. This amazing man deserves considerable recognition for his contribution to the science, practice, and teaching of neurosurgery. The article on the mechanical factors influencing cerebrovasospasm is a masterpiece of observation, investigation, and deduction, beautifully presented and illustrated, starting with Arutiunov’s first proposal that these small strands were not put there by sheer chance and did not represent simple continuations of meninges.

Those who have been privileged to meet Academician Arutiunov are immediately impressed with the vitality and the youthfulness of this gentleman, who is now reported to be 70 years old. Visiting his workshop, which is the Burdenko Institute, is an experience no one can ever forget. One is impressed with the warmth and charm of this many-sided man, his gracious hospitality, and also the stern, driving force that is always unmistakably present propelling, guiding, and correlating a multitude of treatment and investigative endeavors being carried out by Arutiunov himself along with the many extremely capable men and women he has assembled to work with him.

He has been a leader in many of the subdivisions of the practice of neurosurgery, the treatment of brain tumors by both surgery and radiation, and the treatment of vascular diseases, to name but a few. He has given generously of his time and capabilities toward the promotion and development of international neurosurgical societies, where again his quick mind and ready humor have been greatly appreciated. His personal warmth, charm, and wit are a constant source of pleasure to his friends.

The sum of the accomplishments of this man cannot be totalled nor ever fully appreciated but he stands today on this memorable occasion of his 70th birthday and the 45th Anniversary of the Burdenko Institute as one of the living greats in our discipline of neurosurgery. We are all proud to be able to pay tribute to this very humane person who wears this mantle of greatness.

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Catecholamine Levels in Spinal Cord Injury

To THE EDITOR: Osterholm’s review of current information on pathophysiological responses to spinal cord injury (Osterholm, JL: The pathophysiological response to spinal cord injury. The current status of related research. J Neurosurg 40:3-33, January, 1974) was commendable in its organization and clarity. However, I suspect that many readers, as I, kept searching for some evidence that catecholamine levels in the systemic circulation had been monitored throughout each experiment; apparently this factor had been ignored by nearly all investigators. It was of particular interest then to find in a subsequent article by Vise, et al., (Vise, WM, Yashon, D, Hunt, WE: Mechanisms of norepinephrine accumulation within sites of spinal cord injury. J Neurosurg 40:76-82, January, 1974) the proposal that localized increase in epinephrine following spinal cord trauma resulted from elevated systemic levels in association with a regional breakdown of the blood-brain barrier.

The failure to consider circulating levels of catecholamines was also manifest in the limited explanation given for the reported protective effect of spinal cord transection at the T-1 level. Such a procedure would, as stated, sever the descending autonomic fibers and thereby, presumably, decrease the release of norepinephrine at the distal sites within the cord. On the other hand, if the mechanism proposed by Vise, et al., is correct, an alternative explanation would be that cord transection at the T-1 level interrupts the sympathetic innervation of splanchnic efferents to the adrenal medulla,
by far the major source of circulating catecholamines.

T. A. DUFF
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RESPONSE: Although the comments of Dr. Duff are certainly valid, the sparsity of data concerning this issue prevented meaningful discussion at the time of the review. However, the circumstances of which he speaks deserve investigation and indeed, at the time his letter was received, our laboratory was in the midst of attempting to clarify this very issue by determining what contributions, if any, catecholamines (CA) of peripheral origin make toward the pathogenesis of spinal cord trauma (SCT) in adrenalectomized cats and in cats with ganglionic blockade (Ecolid). Because of the scarcity of data and in view of the proposal of Dr. Vise, we felt it would be of value to answer Dr. Duff after we had obtained some tangible data from these studies.

Research by one of us (Irvin, JD: Histofluorescent studies of the normal and injured cat spinal cord. PhD thesis. Philadelphia, Pennsylvania: Hahnemann Medical College and Hospital, 1973), as well as by Vise, et al., will show that the increase in histofluorescence (HF) seen at the injury site in traumatized animals is still present at essentially the same intensity and loci in adrenalectomized animals, while both quantitative and qualitative HF alterations do appear to occur in the Ecolid animals. In addition, there is evidence of some morphologic alterations with both treatment modalities. Biochemical studies are as yet incomplete. Although these data suggest some degree of peripheral contribution to the posttraumatic events, it cannot be concluded that the contributions are necessarily a result of a direct action of peripheral CA unless other peripheral events associated with the increased sympathetic activity, such as the blood pressure response and associated afferent input into the CNS, are evaluated.

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Quality and Quantity of Neurosurgical Training

TO THE EDITOR: In recent years there has been concern about the increasing number of neurological surgeons practicing in the United States. It can be seen from the table below that, even for certified neurosurgeons, the ratio of population per neurosurgeon has dropped steadily in the 10 years from 1960 to 1970.

<table>
<thead>
<tr>
<th></th>
<th>1960</th>
<th>1965</th>
<th>1970</th>
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<tbody>
<tr>
<td>certified neurosurgeons</td>
<td>875</td>
<td>1073</td>
<td>1486</td>
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<tr>
<td>population per certified neurosurgeon</td>
<td>205,000</td>
<td>173,300</td>
<td>136,600</td>
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<tr>
<td>total neurosurgeons</td>
<td>2,350</td>
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<tr>
<td>population per neurosurgeon</td>
<td>87,017</td>
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<tr>
<td>U. S. population</td>
<td>179,323,175</td>
<td>191,267,550</td>
<td>203,211,926</td>
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If one considers all those physicians listed in 1970 as practicing neurosurgery, the ratio drops sharply to 87,017 per neurosurgeon. It is unlikely that the practice of clinical neurological surgery in this country will be altered in the next 10 to 20 years along the lines suggested by Dr. Sachs in his recent communication. That there has been a steady increase in the density of neurosurgeons practicing in the United States is clear. That there has been increasing concern about the effects of this increasing density is also clear. It seems to me that we must study this problem and seek remedies if possible. These remedies should have as their goal maintenance of high quality as well as sufficient quantity, that is, availability of neurosurgical care. When the population per neurosurgeon varies from 30,260 (Washington, D. C.) to 222,085 (South Dakota), it is obvious that availability of neurosurgical care is an important consideration. The American Board has been concerned since its inception with the first problem, namely, availability of neurosurgical care. After all, what is a sufficient quantity of neurosurgeons? Is it one per...