is low.³ Smoking diminishes the resistance to upper respiratory infections.⁴ In Parkinsonian patients the low incidence of smoking may account in part for their "resistance" to the common cold.

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Environmental reduplication associated with a right thalamic haemorrhage

Sir: Environmental reduplication or reduplication of place is an uncommon disorder (and exceptional as an isolated cognitive deficit) of spatial orientation. The patient states that there are two or more places with identical attributes, although only one exists in reality.¹ The location of the lesion or lesions responsible for this disorder was uncertain until Benson *et al*² suggested, because there were no specific neuropathological correlations, that it may be the result of combined right hemisphere and frontal lobe dysfunction. Recently, Ruff and Volpe³ reported four patients with clear-cut evidence of right frontal or parietal lobe injury, confirming Benson's view about the importance of the non-dominant hemisphere pathology. Therefore, we wish to record an unusual case of environmental reduplication associated with right thalamic haemorrhage.

A 74-year-old right handed hypertensive man was admitted with a sudden onset of headache, somnolence, left-sided hemiparesis, left sensory loss and a left homonymous visual field defect with a tendency to neglect the visual deficit. His

past history was unremarkable with the exception of a mild intellectual decline in the last few years. A CT scan showed a right thalamic haemorrhage with extension to the posterior limb of the internal capsule and to the ventricular system, particularly the third and right lateral ventricles (figure). A moderate cerebral cortical atrophy with mild ventricular dilatation was also observed. After five days he was awake and alert, but apathetic, without aphasia, apraxia, agnosia or disturbances of the body scheme. There was no right-left disorientation. His memory for past events was normal, but the immediate recall was poor, and he had difficulty in learning new material. While drawing, he worked from right to left on the right side of the paper, with neglect of the left side contours. He placed the midpoint of a line far to the right.

Fig CT scan. Right thalamic haemorrhage with intraventricular extension

He was orientated in person and time, but when asked where he was he stated that he was in Finland. When he was told he was in a Buenos Aires's clinic he said: "Oh, yes, I'm in a clinic: it is a nice clinic like the one you have mentioned, but it isn't in Buenos Aires, it is in Finland". While in the clinic he always insisted that it was located outside Buenos Aires, although the location of the reduplicated place was varied from day to day. Later on he was transferred to his home where this remarkable disorder of orientation persisted until his death, two months after the stroke. The following is an example of this disorientation. "Where are you", "I'm at home, I've been living here for 30 years" (correct). "Where is your home?" "They say it is in Buenos Aires, but I don't know which city is this". (Sometimes

he precisely mislocated his home in any other city or country in the world, such as Paris, Quito, Santiago de Chile, Venezuela and Spain). "Which street do you live in?" "I live in Talcahuano Street" (correct). "But Talcahuano Street is in Buenos Aires, isn't it?", "Yes, yes, it may be". "Then your house is in Buenos Aires?"; "They say so, but I don't think it is in Buenos Aires".

To our knowledge, this is the first case of environmental reduplication associated with a thalamic injury. Fisher⁴ described a hypertensive woman with a right thalamic haemorrhage, who had a severe disorientation of place, but, unlike our patient, she did not show the pattern of reduplication. We think this striking behavioural abnormality developed in this case as a consequence of an acute right hemisphere injury superimposed on a background of a mild diffuse cerebral involvement. It is also interesting to note that the reduplicative phenomenon persisted despite the fact that the patient was transferred from the clinic to his home.

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Intramedullary spinal schwannoma

Sir: Schwannoma, originating from the schwann cells, accounts for approximately 30% of primary intraspinal neoplasms.^{1,2} However, intramedullary schwannoma of the spinal cord has been rarely reported.³⁻⁶ Although microsurgical techniques and computed spinal tomography have become available, total removal of a spinal intramedullary tumor is considered to be a difficult procedure and neurological sequelae may remain after operation. Intramedullary schwannoma may often be misdiagnosed as spinal cord glioma on operation, and in these instances, total

removal might not be attempted. We describe a cervical intramedullary schwannoma which was successfully excised, and discuss the origin of schwannoma within the spinal cord.

A 47-year-old man with progressive weakness and pain of the right arm and leg was admitted to the neurosurgical department. One year earlier he began to suffer from pain and paraesthesia around the right shoulder and in the lower cervical area which radiated to the right hand. For the last 4 weeks, weakness and paraesthesia in the right side limbs and urinary incontinence advanced progressively. Neurological examination revealed a severe weakness in right arm and leg with a mild spasticity. Muscles of the right shoulder girdle appeared slightly atrophic and deep tendon reflex was more brisk on the right side. There was hyperalgesia on the C3 to T8 dermatome in the right side and C7 to T8 dermatome in the left side and hypoalgesia below T9 level. Vibration and position sense in the lower extremities were impaired. Pantopaque myelography demonstrated an intramedullary space-occupying lesion with the lower level at C5. The cerebrospinal fluid contained 180 mg/dl protein. An emergency laminectomy from C3 to C6 was performed since quadriplegia developed suddenly following myelography. The dorsal column of the C4 appeared slightly expanded and was bluish in colour. A longitudinal incision at the right posterior column of C4 was performed. At a depth of 2.5 mm a purplish, firm, fairly well encapsulated tumour was encountered. It was possible to separate the tumour from the surrounding neural tissue. Total removal of the mass, which was in the posterolateral portion of the cord near the dorsal root entry zone was accomplished, and the tumour did not seem to have any continuity with the posterior root. Microscopic examination revealed a dense cellular mass of bipolar spindle-shaped cells arranged in palisades. Two weeks after operation, volitional movement of both legs was noted and superficial sensations were also improving. On examination six months after operation, he was able to walk unaided for a short distance and had good function of both hands with no sphincter disturbance.

There has been debate concerning the origin of the intramedullary spinal schwannoma, and various hypotheses have been advanced to explain the occurrence of this tumour. Schwann cells have been found along the endomedullary perivascular

nervous plexuses,^{7,8} or along some aberrant endomedullary peripheral fibres⁹ in the spinal cord. Mason⁴ outlined the role of the so called "critical area" as source of the tumour. This area corresponded to the point where the posterior roots lose their sheaths on penetrating the pia mater, and could be the origin of these tumours. They might arise from pial cells, considered to be of neuroectodermal origin, which might be transformed into schwann cells, or schwann cells may accompany the spinal root inside the spinal cord for a short distance. The possible differentiation of multipotential mesenchymal elements of central nervous system into schwann cells has also been hypothesised.¹⁰

It seems more likely that the neoplasm in our case began near the dorsal root entry zone with its sheath containing schwann cells and pierced the pia-arachnoid; the schwann cells subsequently proliferated within the spinal cord. Because this tumour is slow growing and benign, the functioning neural tissues surrounding it are relatively tolerant to chronic compression of mass, and functional recovery of the neural tissue after total removal of the tumour can be expected. Since it is a circumscribed, potentially enucleable and curable neoplasm, every effort should be made to remove the entire mass with minimum damage to the adjacent neural tissue. If the tumour is found to be large, it is preferable to remove it in sections with internal decompression of the tumour to avoid damage of nerve tissue. On the other hand, it should be considered that tiny vessels from the anterior spinal artery must be preserved to avoid ischaemic damage to the cord.

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Cervical cord compression due to chondromatous change in a patient with metaphysal aclasis

Sir: Metaphysal aclasis affects only those bones or the portions of bones which develop both from cartilage and from membrane. The most characteristic feature is multiple outgrowth of exostoses from the surface of long bones.¹ Exostoses remain asymptomatic in most cases and rarely cause secondary neurological complications, in the form of compressive neuropathies and cord compression.²

A 25 years old Sikh male, 5 months before admission to the hospital noted slight weakness of the legs and difficulty in walking which did not interfere with daily activities. Three months later weakness of the arms was also noticed. Two months later there was dull aching pain and rapidly increasing weakness of both legs. At the time of admission he was able to walk about 50 metres with support. There was no history of root pains, girdle sensation or bladder disturbance. The patient was the youngest of six siblings. No one else in his family suffered from a similar illness. On examination there was a thoracic scoliosis with convexity to right and the lumbar lordosis was exaggerated. Height was 164 cm upper segment 84.5 cm, lower segment 79.6 cm and span 163.5 cm. The wrist was abruptly widened and a genu valgum deformity was present. There was a painless hard swelling of 8 cm × 5 cm on the dorsum of neck at the level of spinous process of fourth cervical vertebra. Wasting of the small muscles of right hand was present. Muscle tone in the arms was normal but there was spasticity of the legs. Power