Indications are that radial growth begins as early as the middle of June and extends as late as the latter part of August, with most growth in the month from 5 July to 5 August. If the spruce in western Alaska grew at the same time of year in 1783 as they grow at present, they might have been adding cells at the time of the major Iceland eruptions but would have been approaching the latter stages of growth during the great Japanese eruption. To judge from a comparison between the ring size for 1783 and the size of adjacent rings, it seems likely that the faint latewood was added toward the end of the growing season. An abrupt drop in temperature in Alaska, such as would seemingly accompany these eruptions (*1*), could account for the sudden cessation of growth in the middle-late growing season and for the thin latewood layer.

It would appear to be more than mere coincidence that two great volcanic eruptions, low summer temperatures in North America, and the unique faint latewood all occurred in the summer of 1783; these phenomena could hardly have occurred simultaneously without being significantly linked.

One important fact that emerges from the association of the 1783 ring and great volcanic activity for this year is that, if the above assumptions are correct, the precise year-to-year accuracy of the tree-ring chronology for western Alaska, at least as far back as 1783, is verified.

Further inquiry into the relationship between volcanic activity and tree growth was undertaken in the summer of 1954 in the Katmai National Monument area of the Alaska Peninsula under the sponsorship of the Katmai Project of the National Park Service. An analysis of a limited sample of ten increment borings of white spruce indicated that similar ring anomalies were produced during summers of historically documented great volcanic activity in this area.

It seems probable that intensive studies of tree-ring records in spruce of the Alaska Peninsula region—an area in which there are eruptions recorded during the summer growing season—would afford enough control data to make apparent certain earlier but previously unrecorded eruptions in the Aleutian arc.

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Regeneration of Adult Mammalian Spinal Cord

Recent research by Windle shows that axons can regenerate across gaps in completely transected spinal cords of animals treated with Piromen (*1*). This observation stimulated a modification of the peripheral nerve regeneration technique (*2*) that was evolved in our laboratory to approach the problem of paraplegia. In brief, the method consists of encasing the proximal and distal ends of the severed portion of the feline sciatic nerve or the spinal cord with a nylon tube (*3*) impregnated with cellulose acetate (Millipore) (*4*). A sling stitch is used between the severed ends to maintain them within the tube.

The H.A. formulation of Millipore has 80% of its volume occupied by 0.45-μ pores. This physical characteristic provides the proliferating neural and supporting elements adequate nutrition by diffusion of body fluids, while protecting the regenerating nerve from invasion by mesenchymal cells in the tissue bed. The plastic is extremely inert in tissues and rapidly becomes surrounded by a pseudosynovium. No foreign-body response is found (*5*).

Complete spinal transection at the third thoracic level in a series of adult cats produced gaps of 4 mm as the segments of the cord retracted. Thirty days after transection, the proximal and distal ends of the spinal cord were united by a firm bridge of tissue (Fig. 1, top). Microscopic examination of histological sections of material from cords 30 days after transection showed an orderly, linear regeneration of axons in the gap without overproliferation of glial tissue or of the pia-arachnoid complex (Fig. 1, bottom).

It is tentatively postulated that peripheral and central neural elements are induced to regenerate in an orderly fashion as the result of the scaffolding provided by the Millipore tube. In addition, the sling stitch may orient the fibrin and other proteins into a pattern favorable for linear regeneration. Experience with peripheral nerves shows that the technique requires a single sling stitch, rather than the multiple filaments advocated by Alexander, Matson, and Weiss (*6*).

Return of function has been verified

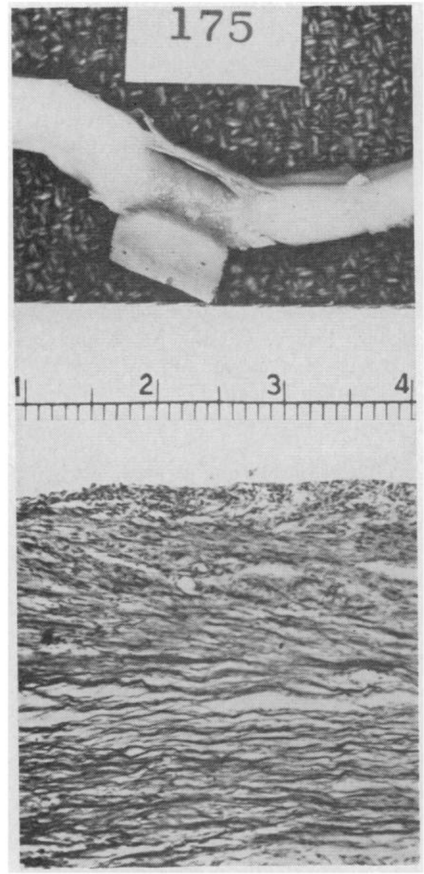

Fig. 1. (Top) Feline spinal cord 30 days after transection, Millipore tube opened (Formalin-fixed); (bottom) axons at the level of transection, 30 days, Bodian (× 200).

70 days after the creation of a 2.5-cm gap in peripheral nerves. However, more time is required before an evaluation of functional return in the transected spinal cords can be made (*7*).

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