Communications

A New Clinical Test for Intravascular Clot

The cardiovascular tree normally contains somewhat over 5 lit of blood in the liquid state. Slowing down of the stream, trauma to the vessels, inflammation, disease, obstruction, and so on, upset this balance. Sludging of the formed elements along the side walls occurs, and this progresses to the formation of a clot. The continued presence of one or more of the precipitating factors causes the clot to extend. Clinically, a thrombo-phlebitis is diagnosed when heat, redness, pain, swelling, and so forth are present. In the absence of these signs and symptoms, the diagnosis is obscure. Despite this, a bland clot of phlebo-thrombosis may be dislodged and migrate to the pulmonary arteries with a fatal result. Despite great activity on this medical frontier, and the use of anticoagulant drugs, the death rate from pulmonary embolism remains unchanged. More than half the fatalities occur in patients who were not suspected of having an intravascular clot.

The bulk of these patients may be picked up by the following test which must be made when the patient enters the hospital. A pneumatic cuff is distended over the calf or thigh slowly to 180 mm of Hg pressure. If pain is elicited before this, the end point has been reached and the cuff is deflated. A positive cuff test is indicated by pain beneath the inflated cuff at 80, 100, or 120 mm of Hg. A negative test that becomes positive a few days post-operatively or several days after a patient has been put to bed with a myocardial infarction is presumptive evidence of intravascular clot and should be treated as such. Several hundred patients have been tested in this manner, and at this time the results are gratifying (*1*).

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Reference

1. For complete details, including case reports and a bibliography, see R. I. Lowenberg, *J. Am. Med. Assoc.*, in press.

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Longevity under Adversity in Conifers

Edmund Schulman's recent contribution [*Science* **119**, 396 (1954)] on longevity in conifers presents many facts concerning the occurrence of particularly old conifers but offers little to account for these occurrences or to clarify the connection between high ages an environments. Actually, there appear to be sound reasons why such old specimens occur where they do and why they represent only a limited number out of the total native coniferous species.

Although, in his paper, Schulman deals primarily with trees growing in environments adverse to rapid growth, the oldest living examples, individuals of *Sequoia gigantea,* are found in environments highly favorable for growth, and this is relatively true also for *Sequoia sempervirens* and *Fitzroya cupressoides*. Young trees of *S. gigantea* almost invariably show rapid diameter increment, and only after they gain considerable size does their growth eventually become slow.

There is reason to believe that the favorable nature of the environment contributes to the unusual longevity in these species. Another very important factor in their longevity is the absence of aggressive insect enemies, such as defoliators or primary bark beetles, or serious diseases other than heart rots. A third factor is their capacity for adaptation to temporary changes in moisture supply or to partial loss of crowns without an accompanying danger of early mortality. A fourth factor is the long-sustained vigor of their root systems, for it is the functioning of the roots that primarily determines the age to which a tree will live, barring destruction by external agencies. With regard to heart rots, the evidence (*1*), which there is not space to discuss here, indicates that there is no basis for regarding them as "a form of dieback," as Schulman's interjected question suggests.

For the species for which longevity appears to be associated with adverse situations, some of the important features in the environment of a long-lived tree are (i) comparative isolation; (ii) low annual precipitation and relatively low air humidity; (iii) absence of destructive pests; and (iv) an exposed position, insuring ample air movement. Open surroundings are essential, not only to encourage a stout, spreading form of growth and as a protection from destruction by running fires, but, more important, to provide ample unoccupied ground into which the roots will be able to spread during the life of the tree.

With some species, geographic isolation is also a prime requisite. It is significant that the only ponderosa pine among the old trees in Schulman's list is situated outside the range of the western pine beetle, *Dendroctonus brevicomis,* and also outside the areas where the needle fungus, *Elytroderma deformans,* is destructive. The propensity of the western pine beetle for attacking old, slow-growing, or declining ponderosa pines is so well established that trees of this character are marked for cutting to prevent their loss from beetles (*2*). Many individuals of species such as Engelmann spruce (*Picea engelmanni*) would undoubtedly reach relatively high ages were it not for devastating bark beetle epidemics (*3, 4*) or activities of other destructive enemies.

Low annual precipitation restricts growth and consequent disadvantageous bulk but still permits the tree to maintain life. Low humidity favors the development of compact foliage and discourages the establishment of disease and decay fungi, an effect further heightened by the rapid air movement associated