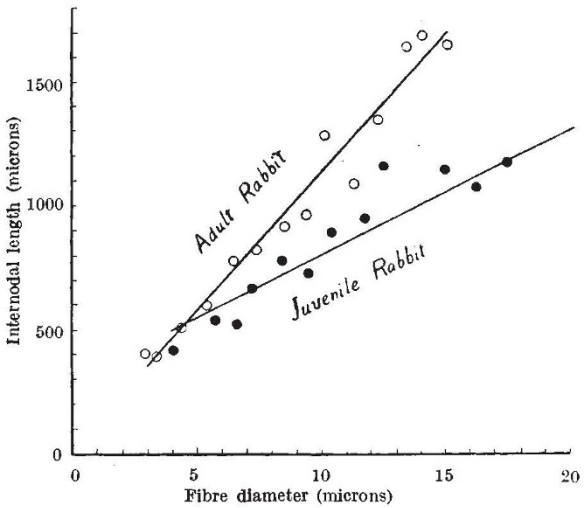


Fig. 4. Relationship of internodal length and fibre diameter in juvenile and adult rabbits. The points are the mean internodal length for each micron of fibre diameter

readily enters and at which, therefore, entrance and exit of other substances is presumably easier than elsewhere. These regions may reasonably be called nodes, even if they do not exactly resemble those of peripheral nerve fibres.

It is not yet possible to say what determines the periodicity of these central nodes; but measurements on two young rabbits showed the interruptions to be spaced less far apart than in adults (Fig. 4). It is therefore probable that, as in peripheral nerves, the details of the spacing depend on such factors as time of medullation and subsequent growth. Although the functional significance of the actual distances of spacing is not yet clear, it seems probable that the presence of these breaks in the myelin is significant for conduction in central as in peripheral nerve fibres[5].

A. Hess
J. Z. Young

Department of Anatomy,
University College,
London.

[1] Feindel, W. H., Allison, A. C., and Weddell, G., *J. Neurol., Neurosurg. and Psychiat.*, **11**, 227 (1948).
[2] Hess, A., and Young, J. Z., *J. Physiol.*, **108**, 52*P* (1949).
[3] Allison, A. C., and Feindel, W. H., *Nature*, **163**, 449 (1949).
[4] Vizoso, A. D., and Young, J. Z., *J. Anat.*, **82**, 110 (1948).
[5] Huxley, A. F., and Stämpfli, R., *J. Physiol.*, **108**, 315 (1949).

## Elastase and Elastase-Inhibitor

We have reported in earlier communications[1,2] that the extract of fresh pancreas as well as that of acetone-dried pancreas powder contains a specific enzyme which we called 'elastase'. This enzyme had not been found before in the human or animal organism; but it was studied first by Eijkman[3] so early as 1904 as a product of bacteria. The elastase of the pancreas dissolves the elastic fibres of the arteries. We found that in the wall of the arteries only the elastic fibres are attacked by this ferment, and the collagen remains unaltered. We have been able to show that our pure elastase differs from other proteolytic ferments of the pancreas such as trypsin and chymotrypsin. Through the kindness of Dr. J. H. Northrop, of Princeton, N.J., we obtained crystalline trypsin and chymotrypsin, and we tested the elastolytic power of these enzymes parallel with our elastase. Neither trypsin nor chymostrypsin exercises any dissolving effect upon the elastic fibres of the arteries; therefore, we can conclude that the elastase is not identical with the known proteolytic enzymes.

In further experiments we found that human, rabbit and cattle blood sera possess inhibitory effects upon the elastolytic activity of elastase. The elastase-inhibitor is not identical with the trypsin-inhibitor described by Kunitz and Northrop[4], or with the plasma trypsin-inhibitor described by Schmitz[5]. Elastase-inhibitor cannot be purified, but it is destroyed by treating it with 2·5 per cent trichloracetic acid, whereas trypsin-inhibitor can be purified in this way. Elastase and elastase-inhibitor form a compound. The law of *Reihenfolge Phänomen* is valid in the interaction of elastin, elastase and inhibitor. In the blood of men suffering from arteriosclerosis, the quantity of elastase-inhibitor is either decreased or it has disappeared entirely.

J. Baló
I. Banga

Department of Pathological Anatomy
and Experimental Cancer Research,
University, Budapest, VIII.
Feb. 2.

[1] Baló, J., and Banga, I., *Schweiz. Z. f. allg. Path. und Bakt.* (in the press).
[2] Baló, J., and Banga, I., *Biochem. J.* (in the press).
[3] Eijkman, C., *Cbl. f. Bakt. I. Orig.*, **35**, 1 (1904).
[4] Kunitz, M., and Northrop, J. H., *J. Gen. Physiol.*, **19**, 991 (1936).
[5] Schmitz, A., *Hoppe Seylers Z. Phys. Chem.*, **225**, 234 (1938).

## Paralysing Activity of Some Heterocyclic Decamethylene-αω-*bis* Quaternary Ammonium Salts

The work of Barlow and Ing and of Paton and Zaimis, recently reviewed by Paton[1], has established that the distance separating a pair of quaternary nitrogen atoms corresponding to optimal paralysing activity for mammals approximates to that occupied by the decamethylene chain. The present work was undertaken with the object of investigating the effect of varying the groups attached to a pair of quaternary nitrogen atoms, separated by a decamethylene chain, upon paralysing and associated activity. In modifying the groups attached to these quaternary nitrogen atoms, we aimed at simulating various chemical features of the tubocurarine molecule.

The substances synthesized are shown in Table 1. Substances 1, 3, 5, 7, 9 and 11 were prepared by refluxing excess of the corresponding tertiary amine with decamethylene dihalide in benzene solution. The remaining compounds were prepared by refluxing excess of the corresponding secondary amine with decamethylene dihalide in benzene solution and treating the resulting tertiary amine with methyl iodide.

All compounds were submitted to a preliminary test in mice for intravenous toxicity and of paralysing activity, using the rotating drum technique described elsewhere[2]. The results of these tests, expressed as the customary fifty per cent lethal and paralysing doses (LD 50 and ED 50), are summarized in Table 1.

In view of the well-established fact that mammalian species may differ considerably in their sensitiveness to any one curarizing agent (see, for example, refs. 3 and 4), a number of the compounds illustrated in