roughly equivalent to a dose reduction of 20 percent. In five experiments (75 mice), no untreated mice survived as long as 2 weeks after exposure to 1100 r, and in four experiments, only one of 90 mice survived 1000 r. In the experiments described in this report, treatment with the colchicine derivative was more effective than treatment with bacterial endotoxin (*5*), although exact optimal dosages have not been established for either compound.

Selective alteration of sensitivity to x-irradiation is of great interest. A determination of whether or not such selective alteration has been accomplished in the experiments described here awaits further study, as does the question of an association between effect on mitosis of marrow cells and survival.

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Localization of Generator Structures of Electric Activity in a Pacinian Corpuscle

In a large number of sense organs the afferent nerve ending is enclosed in an adventitious structure, the end organ. The question of what the end organ's function is goes back to the early days of sensory physiology. Is it a link in the chain of events which transduce stimuli into nerve impulses, or does it merely play a passive role in reception? The question is here asked for the case of the Pacinian corpuscle. The end organ of Pacinian corpuscles—namely, the capsule—is large enough to allow its dissection. It consists mainly of a peripheral zone (mean transversal diameter 650 μ) with concentrically arranged lamellae and a thin, more compact inner core (transversal diameter about 25 μ) with bilaterally arranged lamellae enclosing the nonmyelinated nerve ending (*1*). The peripheral zone could be peeled off by dissection under a microscope with dark-field or phase-contrast illumination while the receptor's ability for producing generator and propagated potentials in response to mechanical stimulation was tested. Single Pacinian corpuscles of the cat's mesentery were isolated, and these, together with a length of afferent axon, were set up in a bath containing an oxygenated Krebs solution. Mechanical stimulation of the corpuscle was provided by the finely graded deflections of a piezoelectric crystal (*2, 3*). The arrangement for recording of the receptor's electric activity has been described in previous papers (*3, 4*).

When the capsule's peripheral zone is progressively removed, an increase in threshold for producing propagated impulses in response to mechanical stimuli is usually observed. But otherwise no significant changes in the mechanoreceptor properties of the corpuscle are found. The capsule can be peeled off, leaving the inner core exposed without causing impairment of the receptor's ability to produce generator and propagated potentials. It would appear therefore that the peripheral zone, which amounts to about 99 percent of the corpuscle's entire structure, is not required for mechanoreception (Fig. 1).

Due to the intimate relation between the inner core and the nerve structures, it was not possible to remove entirely the former without causing damage to the nerve ending. Small fragments of the core could, however, be cut out, or incisions could be made into the core tissue, without the preparation losing its characteristics as a mechanoreceptor.

In a capsule in which the peripheral zone is stripped off, myelinated or nonmyelinated parts of the axon which ordinarily lie inside the capsule can be compressed, selectively, while their mechanoresponsiveness is being tested. A fine steel hook, driven by a micromanipulator, was used for compression. If the region of the first node of Ranvier (ordinarily intracorpuscular) is compressed, the production of regenerative potentials in response to mechanical stimuli is abolished. Generator potentials can, nevertheless, still be detected. The effect is reversible if low pressures are employed.

Functioning of the nonmyelinated nerve ending is required for the production of generator potentials. After 36 hours of Wallerian degeneration of the corpuscle's afferent axon *in situ*, no generator potentials can be detected in response to mechanical stimulation. In addition, support for the foregoing statement comes from compression experiments. The nonmyelinated terminal stretch is long enough (600 μ) to be compressible, in part, or along its entire length, by a steel hook. Upon compression of the entire ending, all sign of generator potential disappears. However, production of electric activity does not require that the ending be intact. When a distal portion of the ending is compressed, this portion, only, becomes irresponsive. The intact central stump continues, nevertheless, to give generator potentials when stimulated mechanically. The effect is reversible, if low pressures are used. Furthermore, a distal portion of the corpuscle, including a fragment of capsule and nerve ending, can be amputated without immediate loss of the mechanoreceptor properties of the corpuscle's central remains. It is concluded that the regenerative potential is set up at the first intracorpuscular node of Ranvier (*5*) and that the generator potential arises at various active membrane sites distributed along the nonmyelinated nerve ending.

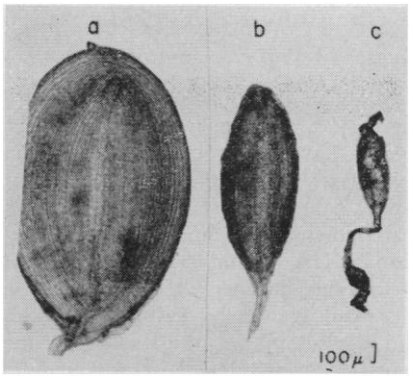

Fig. 1. Phase-contrast photomicrographs of an unstained living Pacinian corpuscle of which the capsular structure has been progressively removed. (*a*) Corpuscle before dissection; (*b, c*) two stages of the dissected corpuscle. Note that in *c* practically only the inner core—that is, about 1 percent of the corpuscle's entire structure—is left over, intact. The corpuscle's ability to produce impulses in response to mechanical stimuli remained unimpaired at all stages of dissection shown.

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