A "NEW" CONNECTIVE TISSUE FIBRIL

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PLATE 94

In the course of studies involving the kidneys, ovaries, and pancreas of the tadpole of the frog (*Rana clamitans* and *Rana pipiens*) we have noted that the fibrous component of the connective tissues of the serosa, adventitia, and the supporting stroma has a microstructure quite different from any other connective tissue fiber previously described.

In Fig. 1 we see a low-power view of a group of such fibers and parts of their neighboring fibroblast, mesothelial, and follicle cells in the mesovarium. Notice how some of the fibers *seem* to be intracellular. On closer examination we find that, in reality, they are all extracellular and that the obliquity of the cell membrane and the very small amount of cytoplasm between the nuclear membrane and the cell membrane cause the confusion. Fig. 2 shows a somewhat higher magnification of some of these fibers. Here their periodicity can begin to be made out. Fig. 3 shows the main period of approximately 270 A and the three smaller interperiods of about 90 A. Fig. 4 shows a still higher magnification. Here one of the main bands is resolved into two bands with a period of about 20 A.

This pattern may be compared to the collagen picture where the main period is 570 to 640 A, and the banding pattern is usually asymmetrical or "polarized."

In the *few* tadpole connective tissues thus far examined, (with the exception of the dermis) (1), this is the *only* periodic fibrous component seen, and indeed is the only fiber demonstrable in most sites. It would seem then that, during the development of the frog, the first connective tissue fiber laid down is structurally quite distinct from typical collagen. This may be related to the 210 A period fiber observed by Porter and Vanamee (2) in their study of fibrogenesis in cultures of chick embryo skin and to the similar observations of Fitton-Jackson (3). It may also be related to the small fiber observed by Wassermann (4) in his studies of the reconstitution of the rodent tail tendon and to the 200 A fibers described by Weiss and Ferris (5).

REFERENCES

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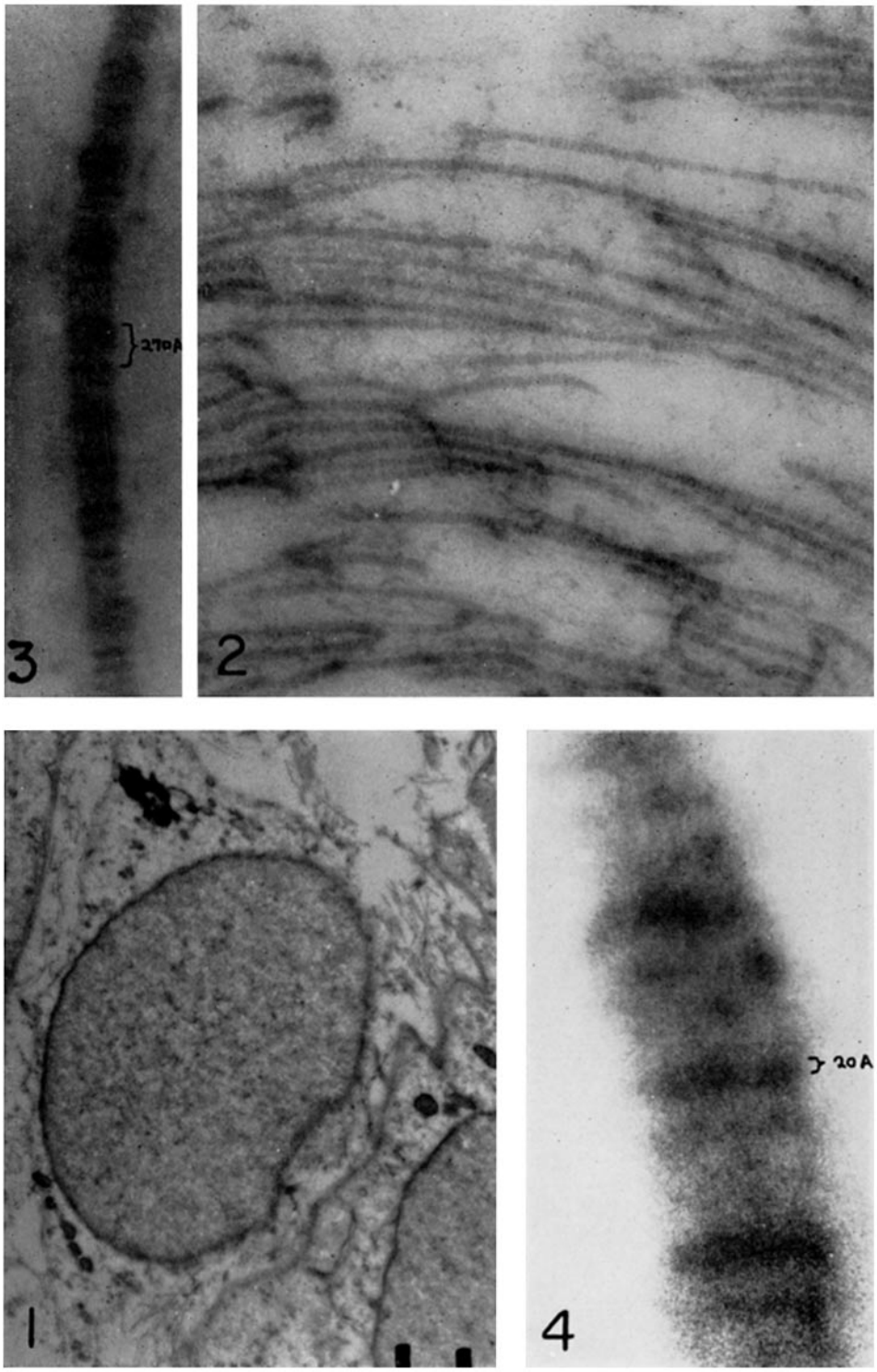
EXPLANATION OF PLATE 94

FIG. 1. Electron micrograph of a fibroblast of the mesovarium of a tadpole of the frog, *Rana clamitans*. Fixed in 2 per cent OsO_4 (adjusted to pH 7.4) for 15 minutes, then washed and postfixed in 2 per cent formaldehyde at pH 7.4 for 24 hours. Embedded in *n*-butyl methacrylate. Sectioned at 0.1 micron. Note fine *extracellular* fibrils. Philips EM100A at 100 kv. × 9,000.

FIG. 2. Same fibrils, sectioned at 0.04 micron. Note periodicity. × 71,000.

FIG. 3. Same fibril, sectioned at 0.1 micron. Note main period of approximately 270 A and interperiods of approximately 90 A. × 260,000.

FIG. 4. Same section as Fig. 3. Note barely resolved spacing in dark band of approximately 20 A. × 960,000.



(Ornstein: A "new" connective tissue fibril)