desired retinal locations and with any desired timing.

With a single spot of 50 msec duration and intensity as high as 1×10^6 ft-lam, we have found the ERG to be extremely localized. When the supporting pad is the indifferent electrode, an ERG is registered only when the thread wick is at the locus illuminated. The response (a-wave plus b- or x-wave) may then be more than 100 μv but generally is less, depending on the retinal locus and the age of the preparation. Moving either the light spot or the wick as little as 1 mm extinguishes the response to at least below the noise level of about 3 μv.

By systematically moving the light spot together with the thread electrode to various retinal loci, we have been able to map the retina electroretinographically. Such a map reveals a functional outline of the optic disk, within which no response can be obtained. It also outlines the retinal margin where the response again falls to zero. Curiously, although we have found a definite increase in sensitivity from the periphery toward the center of the retina, it is not a smooth gradient. Instead, "peaks" and "valleys" of high and low sensitivity appear to exist. It is possible that these are artifacts caused by trauma of preparation, although no other evidence of physical injury can be found. Actual tears in the retina completely eliminate the ERG at the site of the injury.

Early investigators (*5*) cited by Granit reported rapid disappearance of the b-wave when the frog retina was removed from the bulb (although, to be sure, they were using less responsive apparatus). Our preparations have yielded apparently normal ERGs for more than 5 hours of experimentation, at times with little evidence of any deterioration or significantly decreased responses. Responses at a given locus are repeatable from one time to another within about 20 percent when the total height of the ERG is measured from the trough of the initial negative wave (a-wave) to the crest of the first positive wave (b- or x-wave). During an experimental session, the preparation was moistened occasionally with Ringer's solution to prevent drying. The use of isotonic glucose does not appear to enhance the response or to prolong the usefulness of the preparation.

Despite the differences in technique, especially the localized recording described here, we have been able, although not consistently, to confirm the inhibition of Granit, Rubinstein, and Therman.

Using two stimulus spots spaced 2 to 3 mm apart on the retina, we did not find any effect of one stimulus on the ERG registered from the retinal locus of the other spot, regardless of the time relationship of the two flashes. With the spots very close together (½ to 1 mm), however, evidence of interaction has been noted. Stimulating one spot alone produces no recordable response at the retinal locus of the other spot, but may *inhibit* the ERG response to stimulation of the second locus for many seconds afterwards. The recovery of the inhibited locus may be observed by repeatedly stimulating that locus and noting the progressive increase in potential throughout the ERG. Thus it appears that interaction of the ERG takes place over small distances on the retina but not over large ones.

Investigation of these and similar phenomena is continuing and a more complete report will be submitted for publication elsewhere. However, we wish to invite attention at this time to this relatively simple technique of registering localized ERGs without the use of microelectrodes.

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Vegetative Changes at Pinacate, Sonora, Mexico

Since 1931, a considerable area at Pinacate, Sonora, Mexico (Fig. 1)—which has certainly been barren of vegetation since 1907–09 (*1*), almost certainly barren of vegetation since 1774–76 (*2*), probably barren since 1697–1701 (*3*), and possibly barren since 1541 (*4*)—has acquired a surface cover of grasses and has developed a soil profile up to 2 inches thick in some places.

Surface material at Pinacate formerly consisted of basaltic lava flows, volcanic cinders, volcanic ash, and saline playa deposits. All areas except lava flows now show some soil profile development, most of the soil consisting of roughly equal parts of local materials (cinders, ash, or playa deposit), blow sand (calcareous), and organic material of recent local origin.

Known factors contributing to the growth of surface cover are (i) slight increase in annual precipitation; (ii) decline in intensity of precipitation (more days with rain, less rain per day); (iii) an increase in winter (gentle) rainfall; and (iv) virtual extinction of mountain sheep and wild burros in the area.

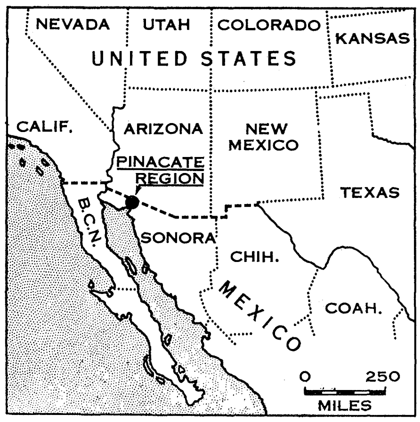

Fig. 1. Summary outline map of southwestern North America showing the location of the Pinacate region.

During the last decade, many of the plunge-pool water holes in the area ("tinajas") have been dry repeatedly, indicating a decline in the cloudburst type of precipitation that refills them; but dry farming in areas just south of Pinacate has been occasionally profitable, suggesting greater soak-in of precipitation.

Many of the larger cinder cones adjacent to the main Pinacate Peaks now support a new growth of cholla cactus (*Opuntia Bigelovii*), all of the cacti being of uniform height and having an estimated age of about 10 years. As a result of these vegetative changes, the Pinacate lava region, when seen from a distance on the ground or viewed obliquely from the air, now has a distinctly green tinge, in place of the dark grays, dull reds, and blacks of former decades.

The cause of this somewhat localized vegetative change is not surely known, although increase in rainfall and alteration of its seasonal distribution and intensity are certainly important factors. It is possible that some of this climatic change is "carryover" from cloud-seeding operations in the mountains east of San Diego.

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