ferent in quality as judged by the double-labeling method. The data presented show that buds of photoperiodically induced *Xanthium* plants synthesize a relatively larger amount of mRNA than do buds of noninduced plants. This suggests that the flowering hormone produced in the leaf acts in the apex either as a gene corepressor or coactivator mediating the production of more mRNA's.

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Retina: Pathology of Neodymium and Ruby Laser Burns

Abstract. *Chorioretinal lesions have been produced in monkeys during experiments with ruby and neodymium lasers. Most of the energy from the ruby laser (wavelength 6943 angstroms) is absorbed by the pigment epithelium, where the greatest damage appears. With the neodymium laser (10,600 angstroms) the neural portions of the retina absorb more of the energy than the pigment layer does; consequently these portions exhibit more damage than the pigment epithelium and adjacent tissues.*

The absorption of high-intensity energy in the visible and near-visible portions of the spectrum, with a subsequent degradation into thermal energy, has long been known to be a source of ocular pathology (*1*). The optical properties of the eye make the retina and its surrounding structures particularly vulnerable, for the energy is focused in this region. The concentration of energy at the retinal region may be 1000 to 10,000 times greater per unit of area than that of energy incident upon the eye at the cornea (*2*). Retinal burns resulting from sungazing during an eclipse, from viewing an atomic fireball (*3*), from clinical photocoagulation (*4*), or, more recently, from exposure to radiation from a ruby laser (*5*) are well known. But because cornea, lens, and other parts of the ocular media have strong absorption bands for wavelengths below 4000 Å and above 12,000 Å (*6*), only energy in the visible and near-infrared region reaches the retina and choroid in sufficient amounts to be dangerous, except in unusual cases.

The pathology of chorioretinal burns resulting from exposure to sunlight (*1*), atomic fireball (*3*), and ruby lasers (6943 Å) (*5*) has been described previously. In general, the injuries follow the course analyzed by Vos (*7*): most of the energy is absorbed in the melanin granules of the pigmented epithelium. These granules heat up and transfer heat by conduction, convection, and radiation to the proteins around them, which as a result of the

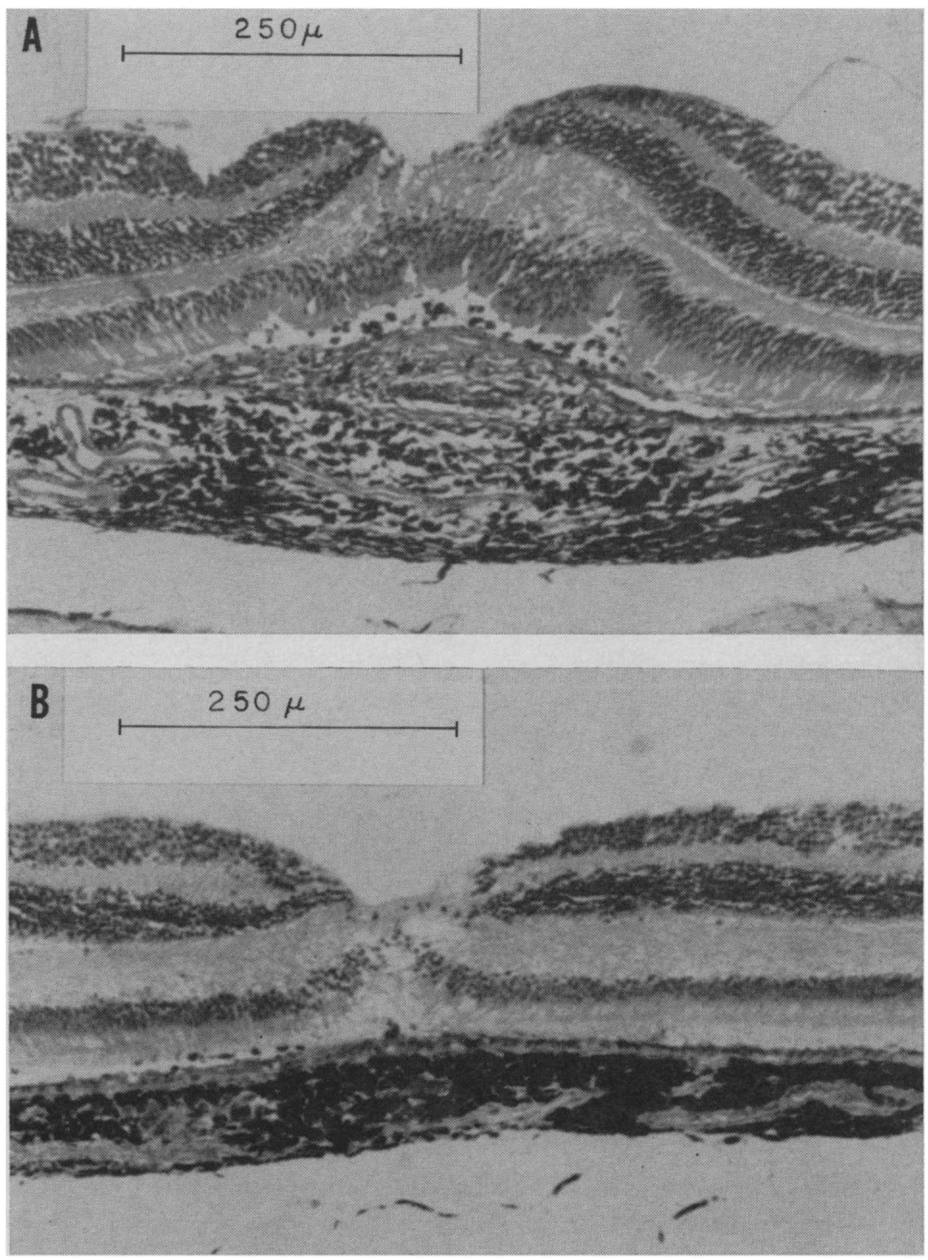

Fig. 1. Cross section of the retina of a monkey eye in the foveal region approximately 1 week after exposure to (*A*) ruby (6943 Å) laser pulse (non-Q switched) of approximately 60 millijoules and (*B*) neodymium (10,600 Å) laser pulse (non-Q switched) of approximately 200 millijoules. Both lesions were produced by an Optics Technology laser photocoagulator (model M-10, MK II) with the appropriate crystal mounted in it.

heating, are denatured, or coagulated.

The pigmented epithelium absorbs approximately 70 percent of the light at 6943 Å. However, its abosrption coefficient changes with wavelength; at 10,600 Å, approximately 20 percent of the light is absorbed. The absorption of the retina itself is slightly higher at 10,600 Å than at 6943 Å, so that at 10,600 Å the neural layers of the retina would be more highly absorbing than the pigment epithelium (*6*). The neodymium laser radiates at 10,600 Å. It therefore seemed likely that the retinal pathology of a chorioretinal burn from a neodymium laser would differ from that of a ruby laser burn. The pathology of an injury in the foveal region resulting from a pulse from a ruby laser is shown in Fig. 1*A*. A large patch of vesicular swelling (probably a gas pocket) is formed in the pigment epithelium, which displaces the rest of the retina. This lesion is accompanied by some degeneration of the adjacent choroid layer. In Fig. 1*B* is shown the result of a burn in the foveal region produced by pulse from a neodymium laser. Little of the energy seems to have been absorbed by the pigment layer, there is no vesiculation in the pigment layer, and there is relatively much greater destruction in all other layers of the retina than in Fig. 1*A*. The amount of energy necessary to cause such an injury is larger than that in the case of the ruby laser because the total absorption at this wavelength is smaller.

These results suggest that the biological hazards and uses of the laser may be a function of the wavelength of the radiating light. For example, the neodymium laser would seem to be almost worthless for photocoagulation, as inflammation of the pigment epithelium seems to be necessary to produce adhesions to hold the retina down. However, the neodymium laser would be more likely to cause involvement of the nerve fiber layer, especially in the region of the optic disk; large portions of the eye could be rendered functionally useless by the destruction of the nerve tracts leading from the disk. Thus the neodymium laser is essentially a greater source of ocular hazard than the ruby laser, when energy necessary to produce lesions of comparable size is present.

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Hemoglobin and Transferrin Electrophoresis and Relationships of Island Populations of Anolis Lizards

Abstract. *Electrophoretic differences in hemoglobins and transferrins serve to differentiate* Anolis *of the same species populating the Lesser Antilles. When based on protein analyses, identifications of individuals may be less equivocal than identification based on descriptions of skin color and markings. Protein differences among island populations appear to be associated with long periods of geographic isolation. Such evidence often confirms estimates of relationship derived from more traditional criteria and in some cases provides a basis for formulating new taxonomic conclusions.*

The lizard genus *Anolis* occurs in large numbers and in a variety of forms throughout the islands of the West Indies (*1*). Many forms have differentiated into definitive species; others represent populations in intermediate stages of species formation. One way of estimating the degrees of divergence of such closely related organisms is by comparison of similarities and differences between tissue proteins (*2*). In our study the electrophoretic behavior of transferrins and hemoglobins was used to gage relationships of certain lizards of the eastern Caribbean, *Anolis roquet* from five islands and British Guiana (Fig. 1) and *Anolis richardi* from four islands (Fig. 2).

Live lizards were shipped to Louisiana State University School of Medicine. Blood, collected after decapitation or by cardiac puncture, was heparinized and centrifuged, and the red cells were separated from the plasma. Cells were washed three times with 1 percent saline, exposed to carbon monoxide to form the CO-hemoglobin derivative, and hemolyzed by alternate freezing and thawing. Plasma and red-cell proteins were analyzed by vertical starch-gel electrophoresis in $0.02M$ sodium borate buffer, *p*H 8.6. Transferrin, the iron-binding protein of plasma, was localized on gel electropherograms by autoradiography (*3*).

Anolis roquet. We have examined blood from each of five named subspecies of *Anolis roquet* (*4, 5*): 35 specimens of *A. r. roquet* from Martinique; 21 *A. r. extremus* from Barbados; 12 *A. r. gentilis* from Bequia; 18 *A. r. aeneus* from Trinidad; and 13 of the same subspecies from British Guiana. Color and pattern differences of this medium-sized lizard have been the major characters used for distinguishing subspecies; however, identification based on these criteria may be equivocal. Even on a single island color and pattern variation, independent of chromatophoric activity, can be startling. On Martinique, with an area of only 975 km^2, ground color of lizards may be deep green, pale yellow, or gray brown. Markings may be white dots or black chevrons. Such variation appears strongly correlated with ecological conditions. Green forms are found in wet montane areas; gray-brown forms occur in the dry areas. A similar situation prevails in Grenada.

Electrophoretic properties of blood proteins are less variable than color and markings. Animals, representing color extremes from four disjunct populations from Martinique, have identical transferrins, hemoglobins, and patterns of plasma proteins. *Anolis r. extremus* of Barbados, likewise, exhibits no intra-island variation. Specimens from the southernmost area of the range of *Anolis roquet*, described as three subspecies (*4, 5*), are electrophoretically indistinguishable. We can not differentiate Trinidad and British Guiana *A. r. aeneus*, Grenada *A. r. cinereus*, and Bequia *A. r. gentilis*