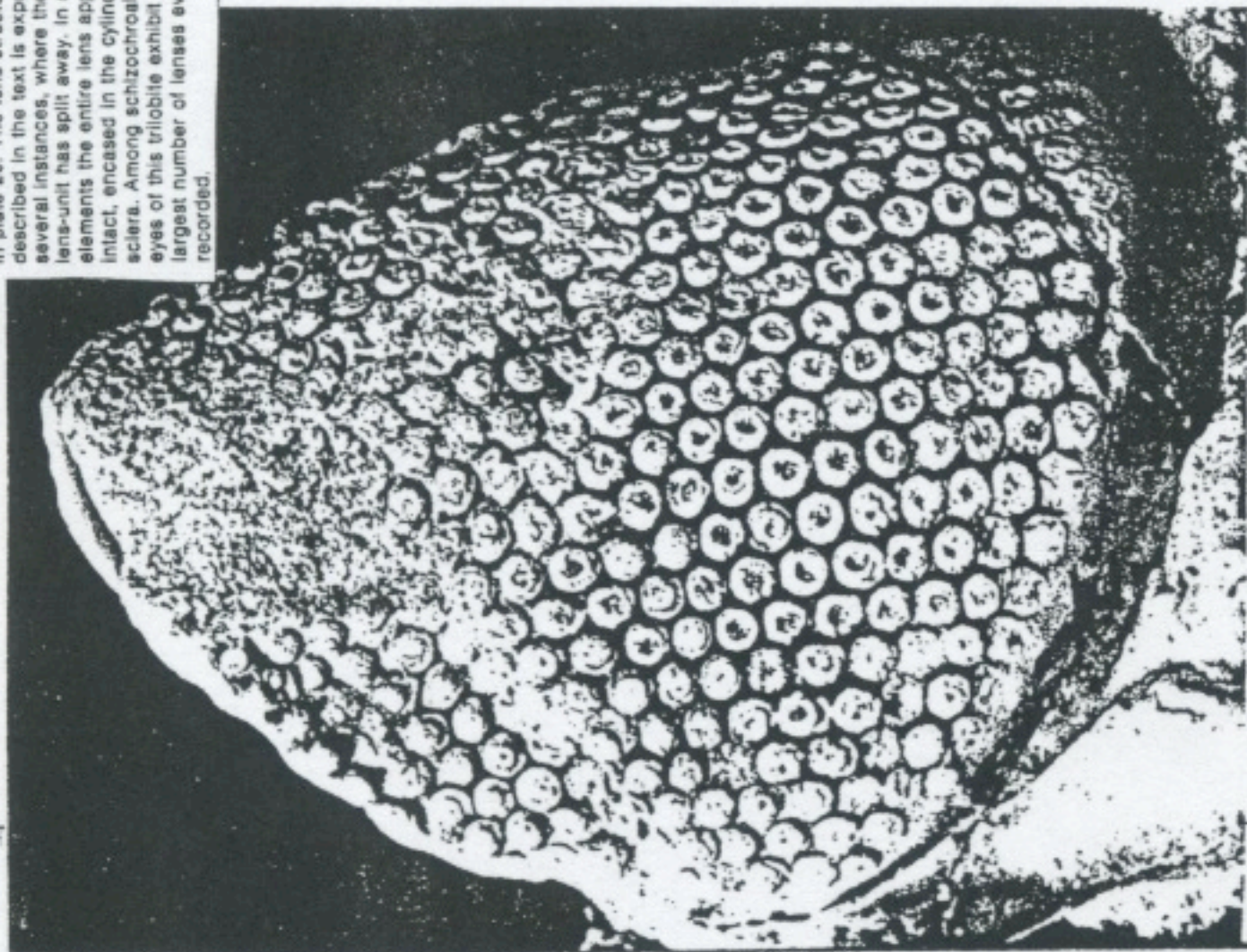


Strange eyes

advanced optics

strange eyes of the past

Plate 21. Frontal view of the right eye of *Dalmanites prattii* Roy, as described in the text is exposed in several instances, where the front lens-unit has split away. In some elements the entire lens appears intact, enclosed in the cylindrical sclera. Among schizochroal eyes, the eyes of this trilobite exhibit the largest number of lenses ever recorded.



From "Trilobites - A Photographical Atlas" by Ricardo Levi-Strauss (1975) ISBN Univ of Chicago Press

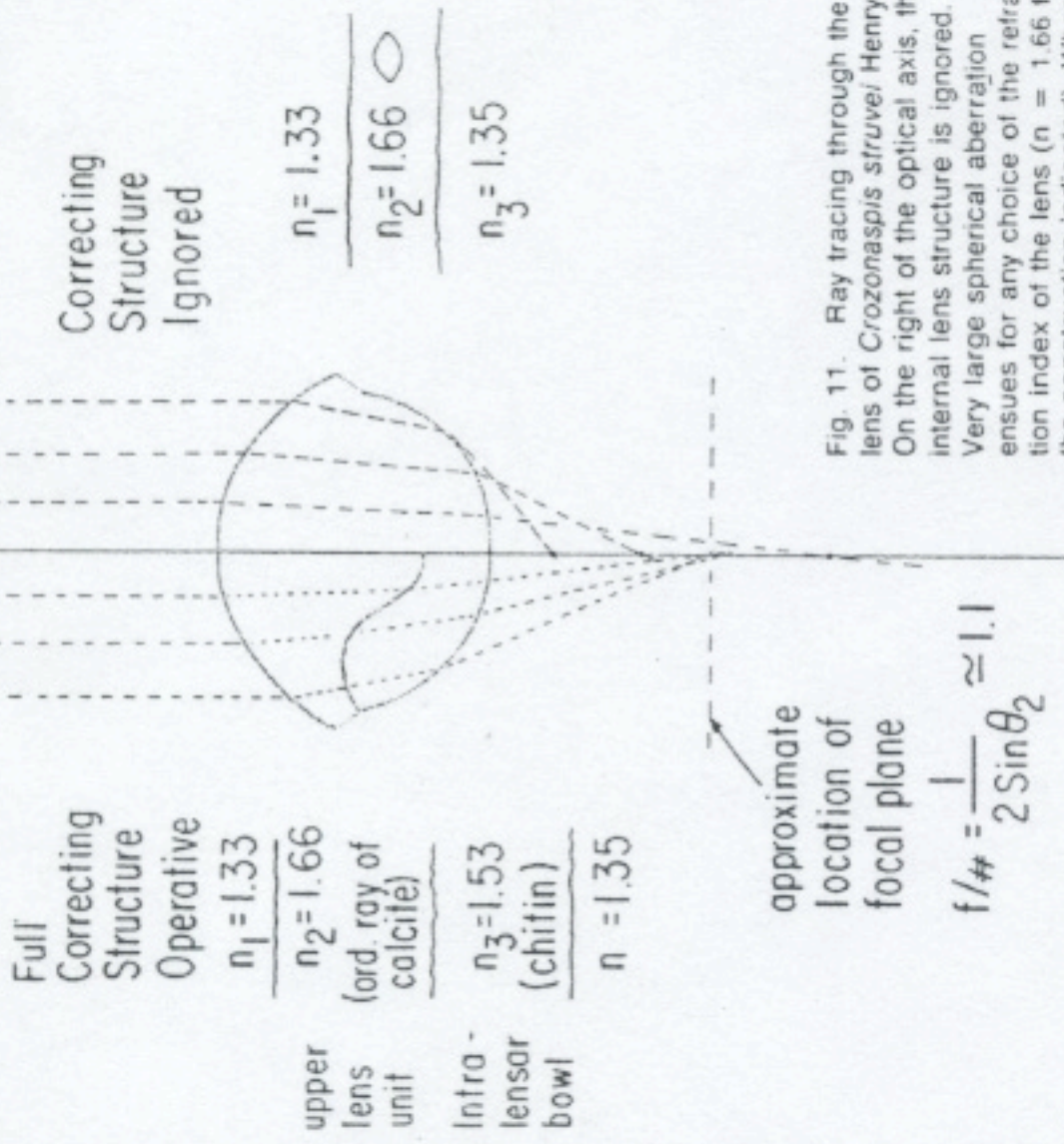
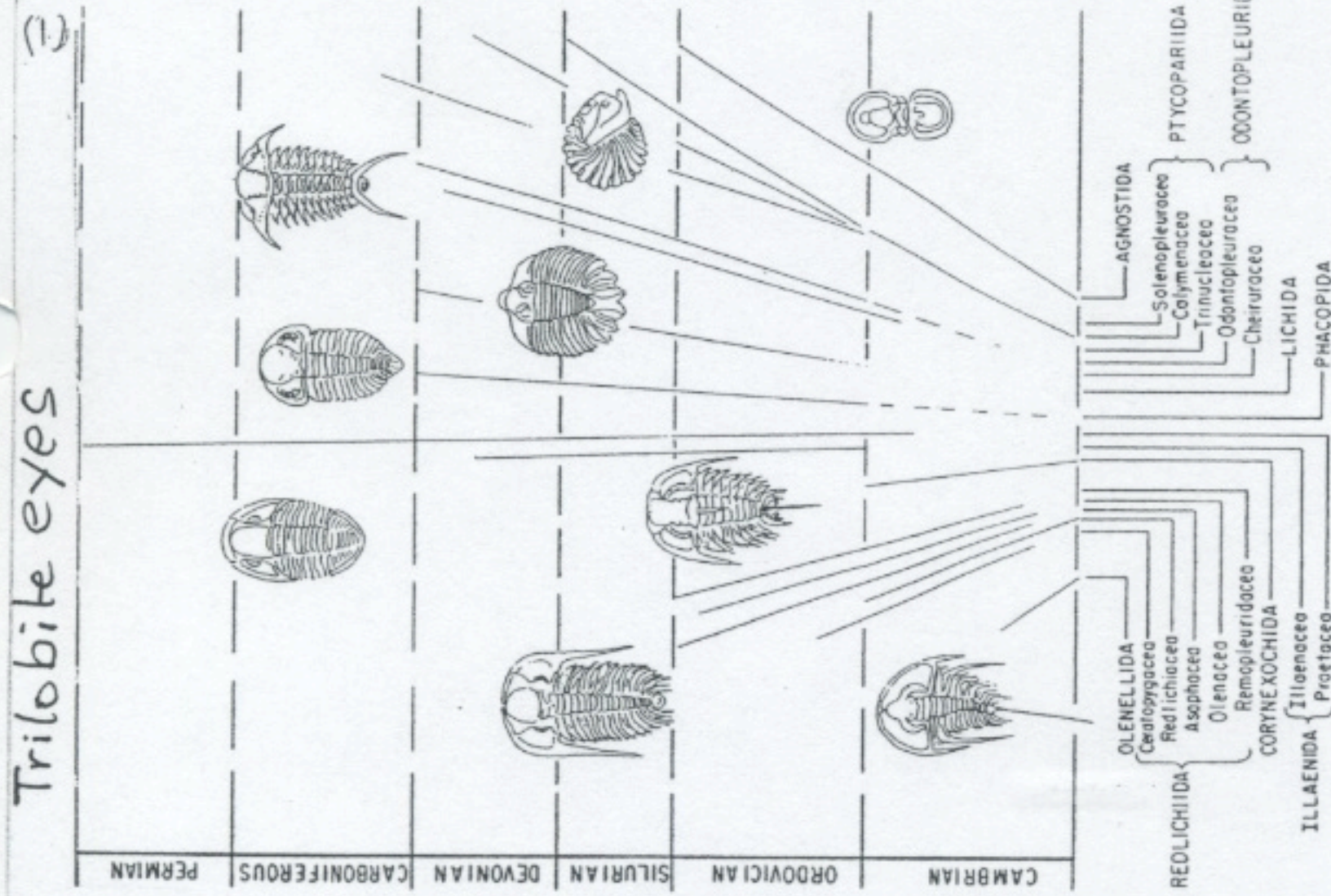


Fig. 11. Ray tracing through the lens of *Crozonaspis struvei* Henry. On the right of the optical axis, the internal lens structure is ignored. Very large spherical aberration ensues for any choice of the refraction index of the lens ($n = 1.66$ for the construction indicated). When the internal structure is taken into account, on the left-hand side of the axis, correction of spherical aberration obtains for the combination of refractive indices indicated. This suggests that the two lens elements were made of oriented calcite and chitin respectively.

Fish Eye

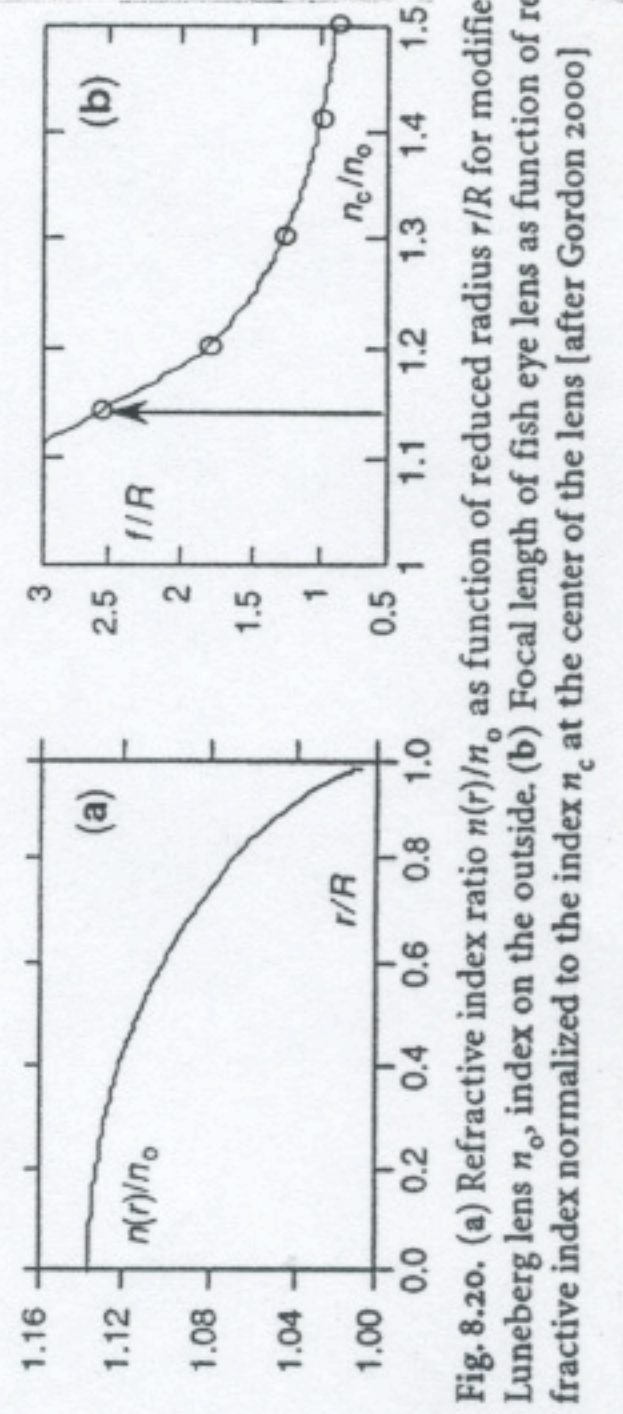
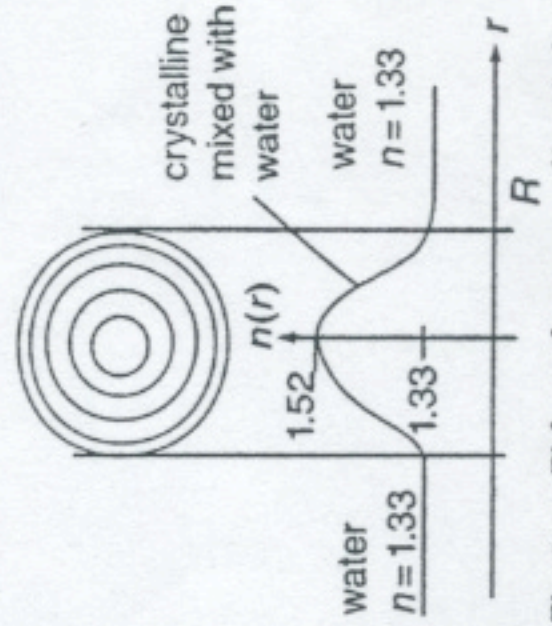
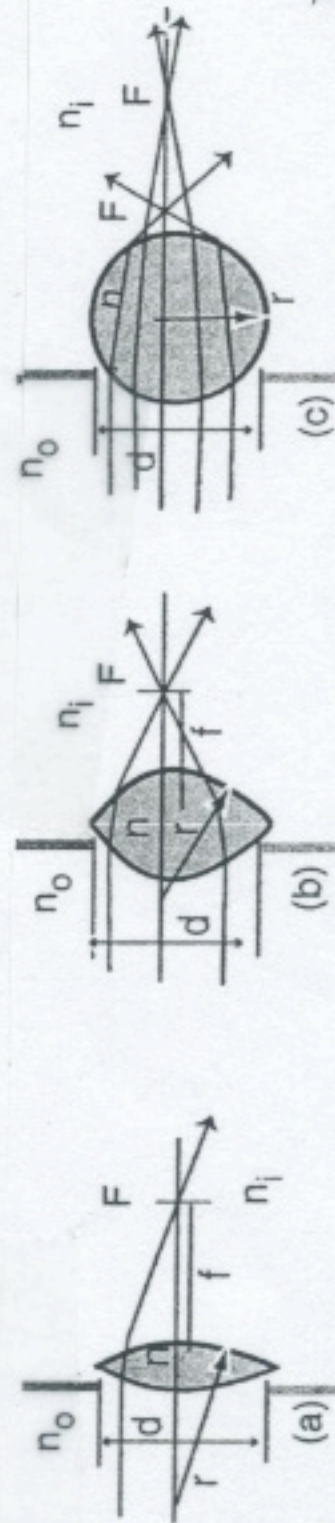


Fig. 8.20. (a) Refractive index ratio $n(r)/n_0$ as function of reduced radius r/R for modified Luneberg lens n_0 index on the outside. (b) Focal length of fish eye lens as function of refractive index normalized to the index n_c at the center of the lens [after Gordon 2000]

Fig. 8.19. Fish eye lens, a gradient index lens