The Refractive Indices of the Eye Media of some Australian Animals.

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While carrying out an investigation on the osmotic pressure of the blood and body fluids of various Australian animals I was desirous of supplementing the data thus acquired with estimations of other physical characters. The refractive indices of the eye fluids presented some interesting features, and I give here in tabular form the results obtained.

The instrument employed was the Abbé refractometer. The outer layers of the crystalline lens were sufficiently fluid to be spread out as a refracting layer on the prism.

	μ of aqueous humour.	μ of vitreous humour.	μ of lens (outer layers).	Temp., ° C.
Land Mammals—				
Rabbit	1·336	—	1·43	10·3
Echidna (A)	1·336	1·338	—	16·5
(B)	1·337	—	—	15·5
Land Reptile—				
Emydura macquaria	1·3357	1·3362	—	15—16
Amphibia—				
Hyla aurea	1·3355	—	1·4675	11·7
Fish—				
Teleosts—				
Marine—				
Barracouta (*Thyrsites atun*) (A)	1·3353	1·3354	1·433	12
(B)	1·3353	1·3354	—	12
Fresh Water—				
Murray Cod (*Oligorus Macquariensis*) (A)	1·3361			
(B)	1·3362	—	1·43	12
Ascidian	1·3524	1·3772	1·46	
Tap Water—				
Yan Yean Reservoir	1·3336			
Sea Water—				
From Hobson's Bay	1·3404			

In connection with these results it is of interest to note that right through the Vertebrates from Mammals down to Teleostean fishes, marine and fresh water, the refractive indices of the aqueous humour, vitreous and lens (outer layers) were about the same in each class of animal, being

approximately 1·336 for aqueous, 1·337 for vitreous, and 1·46 for lens. Determinations of the Δ of the aqueous humour of various animals show that this is approximately the same as the Δ of blood serum of these animals (Portier (1), Steindorff (2)), and thus varies in the different classes of animals.

Moreover, on comparing the refractive index of the aqueous humour of the sea-water Teleost (Barracouta) (1·335) with the refractive index of the sea water (1·340), it will be seen that we have here a unique phenomenon, virtually the tendency to the development of a "negative eye," but, of course, the almost spherical lens of refractive index about 1·46 will correct any tendency in this direction.

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(1) Portier, P. "Pression Osmotique des Liquides des Oiseaux et Mammifères Marins," 'J. de Phys. et de Path. Gén.,' 1902, p. 202.

(2) Kurt Steindorff. 'Handbuch d. Biochem.' (ed. by Oppenheimer), vol. 2, Part 2, p. 351.

Note on the Iridescent Colours of Birds and Insects.

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