

## Subsection Zoology

## Lens Action by Jelly of Frog's Eggs

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In an earlier paper (Bragg, 1953) I reported that the jellies about the eggs of *Rana areolata* act as lenses, thus making the eggs appear superficially larger than measurements showed them to be. This phenomenon recalled to me the old notion that the jelly might function in capturing radiant energy from the sun. Rugh (1951, p. 56) denies this function for the jelly on eggs of *Rana pipiens* (subspecies not mentioned). Since the evidence cited for his opinion seemed valid, I had given the matter little further thought till the observations reported below were made. As will be evidenced, these do not show radiant energy to be captured, but only that some individuals of *Rana pipiens* produce eggs whose jellies bend the rays of visible light, essentially as originally reported for *Rana areolata*.

On the afternoon of February 23, 1961, a breeding congress of *Rana pipiens berlandieri* Baird was observed in central Oklahoma near Norman. The following morning snow was falling and the temperature approximated freezing. At about 9:30 a.m. on February 25, several egg masses of this subspecies were found in the pool in question. Ice, estimated to be  $\frac{1}{8}$  inch thick, covered the eggs. All snow had disappeared and the air was warming fast.

The eggs of one clutch appeared to be nearly twice the size of those in another beside it and its jellies also seemed larger. Since this was unexpected, some eggs of each clutch were collected for more careful examination. The appearances were unchanged after the ice was broken.

In the laboratory, it was quite clear that both the eggs and the jellies from each clutch appeared larger or smaller depending upon the angles of observation and also upon whether or not the jelly was completely submerged in water. The appearance was not an illusion based upon the well-known phenomenon of refraction when light enters water. The eggs, therefore, appeared to vary in size only from a lens action of the jelly. Since most leopard frog eggs observed in Oklahoma have not shown such a lens effect of the jellies but, also, since they have usually been found at a higher water temperature, it might be that the jelly differs when produced in colder pools. In the particular case reported here, however, the lens effect was not changed in the warmer conditions of the laboratory. It, therefore, appears that the egg jelly of a single frog was intrinsically different than that usually produced in this subspecies. The eggs left in the pool hatched normally.

## LITERATURE CITED

- Bragg, Arthur N. 1953. A study of *Rana areolata* in Oklahoma. *Wasmann Jour. Biol.* 11:273-318.
- Rugh, Roberts. 1951. The frog, its reproduction and development. McGraw-Hill, N.Y.C.