

SHELL INJURIES OF LAND MOLLUSKS

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ABSTRACT

F. C. Baker and others have called attention to the importance of the study of abnormal specimens of Mollusca in papers discussing monstrosities found in the Unios, with reference to variation and possible specific change. One type of abnormality which has no relation to the problem of evolution and yet has considerable biological importance is that sort of abnormality associated with or resulting from damage to the shell or to the animal. Under conditions of nature molluscs are constantly subjected to injury of the shell either by attack of predators or by accidental breakage. Studies of repair and abnormality due to injury to the mantle seem to be lacking in the recent literature.

For two years, monthly collections of land snails have been made in the vicinity of White Heath, Illinois, on the floodplain of Sangamon River. This habitat appears to be optimum for the development of *Polygyra thyroides* and *Polygyra pennsylvanica* because of their abundance. In making the October collection, a living specimen of *P. thyroides* was observed to be seriously injured, bearing a large irregular hole in its shell. This hole was so large that the foot extruded through it instead of through the normal aperture when the snail crawled. The specimen was brought to the laboratory and kept under observation. In 26 days the repair was completed and the individual was apparently normal except no cuticle was formed over the regenerated portion of the shell. The study of this individual suggested a statistical study of the adult shells in the combined monthly collections for evidence of mishap.

Of the 401 specimens of *P. thyroides* examined, 133 had recorded on their shells some form of injury. About 33 per cent of the adults were injured in some manner. Most of the injuries were of a minor character although about 5 per cent of the total number had injuries that involved serious damage to the shell. Sixty-six specimens of *P. pennsylvanica*, taken from the same habitat, exhibited about 15 per cent of the total injured of which again 5 per cent bore major injuries.

Injuries of like nature were observed to occur in other species found associated with these two species. No attempt is made to explain the cause of these injuries. The habitat is an undisturbed woodland on a river floodplain, free from domestic animals, so the snail injuries cannot be the result of their tramping. No doubt the amount of injury is closely correlated with the specific habits. Active species exhibit more injuries than the more seclusive forms.

These observations have particular value in demonstrating the extent to which repair is possible for the injured shells of land snails. The region of the aperture and especially the reflected lip seem to be particularly susceptible to accidental breakage but here the free edge of the mantle which secretes the shell facilitates reconstruction. Regeneration of broken areas far removed from the aperture gives evidence that the mantle surface is capable of reforming new shell material. In many cases traumatic injuries inflicted damage to the mantle and other soft parts of the body as demonstrated by abnormal form of the shell of the injured snail. In numerous specimens injuries to the mantle became perpetuated as spiral incised lines or ridges continuing in successive whorls as the shell grew in size beyond the damaged area.