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“The Biology of Middle-earth”**Friedhelm Schneidewind**

In principle, the biological rules of our primary world also apply to Middle-earth; after all, Middle-earth is our world (*Letters* No. 151, p.186, No. 151 p. 220). The same is true for the basic principles of evolution: variation and selection, which result in adaptation to differing environmental circumstances. Tolkien was aware of these principles and he also knew the correct definitions of “species” and “race” in zoology: two animals belong to one species if they can produce fertile offspring. If clearly definable differences occur within one species, the developing systematic units are called subspecies, breeds (domesticated), and races.

Tolkien noted that “*Elves and Men are evidently in biological terms one race, or they could not breed and produce fertile offspring*” (*Letters* No. 153 p. 189), thereby describing an inbreeding group which is not a race but a species. However, he often uses biological terms correctly, for example when describing Hobbits as “*really meant to be a branch of the specifically human race*” (*Letters* No. 131 p. 158), in pointing out that the Drúedain show “*racial difference[s]*” (*Unfinished Tales* 385), and in counting men as “*Second Race*” (*Letters* No. 153 p. 189).

However, Elves, Men and Dwarves are created differently, which poses a problem in using scientific terms. Tolkien usually circumvents this by introducing “*kindred*” for races. Thus, Eärendil is “*representative of both Kindreds, Elves and Men*” (*Letters* No. 131 p. 150). This shows that, for Tolkien, the concept of *origo gentis* (“*history of bloodline*”) was much more important than the point of view of the biological sciences.

Examples of ‘regular’ evolution in Middle-earth are Hobbits and Drúedain. Their dwindling is explained by typical processes of selection; the dwindling of the Hobbits “*must be due to a change in their state and way of life*” (*Unfinished Tales* 287). Similar circumstances are reported for the Drúedain (*Unfinished Tales* 383).

While Trolls and Dragons are products of deliberate breeding, this is not explicitly clear for Orcs. The *Silmarillion* gives two Elvish theories on the origin of Orcs. The first one states that Melkor bred Orcs from Elves “*by slow arts of cruelty ... corrupted and enslaved*” (*Silmarillion* 47), designed to be “*mockeries of the Children of Ilúvatar*” (*Silmarillion* 310). The second hypothesis assumes Orcs were “*perhaps ... Avari who had become evil and savage in the wild*” (*Silmarillion* 102), which would be a case of typical evolution. Other texts show further theories ranging from “*Morgoth ... bred Orcs from various kinds of Men*” (*Unfinished Tales* 385) to the crossbreeding with lesser “*spirits*” like Maiar (*Morgoth’s Ring* 409-424). Fact is that Orcs are ordinary living beings; they “*had life and multiplied after the manner of the Children of Ilúvatar*” (*Silmarillion* 47) and did not spring from mudholes.

The exact origin of Trolls, perhaps from giant apes but possibly also from Men, Orcs, or “*Spirits*” is not known, but all of these were breeds for the purposes of Melkor and Sauron (*Morgoth’s Ring* 414).

Tolkien calls Trolls “*the older race of the Twilight*” (*LotR*, III 410), but whether the different kinds of Trolls really belonged to one species remains unknown: “*But there are other sorts of Trolls beside these ... Stone-trolls, for which other origins are suggested.*” (*Letters* No. 153 p. 190).

Dragons belong to the “*many evil things that Morgoth has devised in the days of his dominion*” (*Silmarillion* 310) and were probably bred from snakes (they have “*serpent-eyes*”, *Silmarillion* 255). The first Dragons were the wingless Urulóki (Quenya: *fire serpent*) which were intelligent and able to breathe fire. Later Melkor bred two variants: Cold-drakes, which were capable of flight but could not breathe fire, and Fire-dragons, which were bad fliers but could produce a fire that was strong enough to destroy Rings of Power, except the One Ring (*LotR* I, 70). Some of these creatures were still living in the Third Age (like Smaug). To achieve this, Melkor might have inbred giant eagles with snakes or Urulóki and it is unclear whether they are races or separate species.

The giant spiders of Middle-earth all descended from “*Ungoliante the primeval devourer of light*” (*Letters* No. 144 p. 188). This is an example of evolution through successive degeneration: in comparison, Shelob is only as big as a horse and the giant spiders mentioned in the *Hobbit* are even smaller and less intelligent.

Ents occupy a place between fauna and flora, showing characteristics from both realms. They could be intelligent and mobile plants which, due to a lack of roots, receive nutrition from various fluids. Or they are animals with certain plant-like characteristics. However, both explanations fit the description of the creation of the Ents as given in the *Silmarillion* (41).

The *Longevity* of Elves and some Men is altogether different from *immortality* which, for example, the Ainur possess (*Letters* No. 112 p. 285, No.153 p. 189). Longevity can actually be explained in biological terms. Single-celled organisms are potentially immortal. Differentiation in multi-celled organisms is paid for with mortality. If this were different with Elves, their aging could come to near total standstill. In Half-elves, Quarter-elves, and so on, different aging processes could then take place.

Longevity in the Ring-bearers, on the other hand, is a modification due to the external influence of the Ring. Regarding longevity and immortality, Tolkien wrote “*that each ‘kind’ has a natural span, integral to its biological and spiritual nature*” (*Letters* No. 131 p. 155). If this natural span is extended beyond its limit, it becomes “*like stretching a wire*”, as in Bilbo’s case. Even in the “*Immortal lands*”, nobody becomes actually immortal, since this “*is strictly only a temporary reward: a healing and redress of suffering*” (*Letters* No. 154 p. 198). The only exceptions to this, Lúthien and Túor, are the result of “*a direct act of God*” (*Letters* No. 153 p. 194) – which is no longer part of the explanatory powers of biology.

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