

## A UNIQUE CASE OF MALFORMATIONS IN A NATURAL POPULATION OF THE GREEN TOAD (*BUFO VIRIDIS*) AND ITS MEANING FOR ENVIRONMENTAL POLITICS

KLAUS HENLE

*Im Kalk 3, 7255 Rutesheim, Fed. Rep. Germany*

In September 1980 Rimpp and Henle surveyed a quarry near Vaihingen (about 25 km NW of Stuttgart) for habitat monitoring and distribution mapping of amphibians and reptiles (Rimpp, 1981).

In the closed down part of the quarry there was a pond (approximately 100 x 25 m, 0.5-1 m deep). In the shallow part of the pond which was bordered by a huge deposit of earth many tadpoles of the Green Toad were found. As immediately was evident some of them were abnormal. Having a closer look we recognised that between 35 and 55% (of more than 1000 tadpoles) were abnormal. We found giant individuals up to 8.5 cm as well as underdeveloped specimens. Furthermore albinistic individuals and individuals with torsions of the tail, asymmetrical bodies and other malformations were present.

Because of these malformations we searched for metamorphosed toads in the vicinity of the pond. We found more than 100 individuals of which about 50% were malformed. Some individuals had 5 or 6 legs. In others arms or legs were missing or ill-developed. In one individual for example the fingers grew out of the shoulder, while in others the legs were stiff or showed a torsion. Malformation of the jaws was quite frequent. In one specimen a part of the lower jaw together with the tongue was missing. Others showed colour aberrations, oedemas or tumours. A detailed account of the malformations together with a review of known anomalies in anurans will be given elsewhere (Dubois and Henle, in prep.).

Because it clearly was evident that our findings were very unusual we took a water sample for chemical examination. To be thorough, we decided to take measurements, with the appropriate instruments, for radioactivity in the quarry. We were very surprised to find high levels of radioactivity in cracks of the huge deposit of earth reaching into the pond at the side where the tadpoles stayed.

We immediately told our findings to the relevant authorities asking them to come to the quarry with us to make more controlled measurements. They went to the quarry without telling me, and after their measurements they told the press that there was no radioactivity in the quarry and that my measurements were wrong. Therefore I went back three days later for continuing field work, which I had to announce to the Manager of the quarry. Two days later he asked for a permit to destroy the habitat, and was granted it the very same day by the same authorities, despite the fact that the chemical analysis of the water was not yet completed. The water of the pond was pumped into a nearby river, and the deposits of earth where I could measure high levels of radioactivity were buried under 5 m of earth. Therefore our first measurements could not be verified.

Later on the Institut für Energie — und Umweltfragen, Heidelberg, undertook long term measurements which resulted in a high possibility of a source of artificial radioactivity buried in the deposit of earth. Details about this are given elsewhere (Henle and Kovacsics, in press). Nevertheless the authorities refused to take these findings seriously. Instead of this they tried to gloss over our findings which included telling deliberate lies. Only with luck and the help of many friends and the great assistance of the "Grüne" — a political party caring especially about environmental problems — after exhausting work it was possible to force the authorities — including the state government — to organise a hearing. Details of the events up to this time can be found elsewhere (Rimpp, 1981; Henle and Kovacsics, in press).

Apart from the discoverers and the authorities, 6 biologists and 3 radiation physicists were invited to the hearing. Two topics had to be discussed during the hearing: the biological aspects of the malformations, and the radioactivity measurements. The government argued that there was a natural explanation for the malformations. They invited Prof. Sander, Institute of Zoology, University of Friburg, who suggested that hybridization could be to blame for the malformations. However, he clearly showed that he did not understand much about toads. The discussions on the radioactivity ended in: it could not be shown definitely that there was artificial radioactivity beneath the deposit, nor could it be excluded.

So the cause of the malformations is still not clear. There were no indications of chemical pollution (Henle in press), and as the Ministry could not give a satisfactory explanation, under public pressure it had to support funds for research work on the malformations for 1982. However, of all the experts on the subject they had to choose Prof. Sander for the job, the same man who was invited to the hearings by them to argue that hybridization was to blame. Meanwhile, neither the discoverers nor the experts suggested by them have been included or even informed about the proposed research.

#### ACKNOWLEDGEMENTS

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#### REFERENCES

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\*Title may change slightly.