

## Mini-Reviews

### Editorial Comment

It is the privilege of the Editors of *Experientia* to occasionally publish articles which fall quite outside the mainstream of experimental biological sciences, but which are deemed to serve as stimulants, perhaps even irritants to the scientific community. The following contribution by F. Schneider is such a case. While we are fully aware that the experiments discussed here, describing simple biological methods to detect delicate physical phenomena, may not appear to be 'reasonable' science, we believe that one should not discard such ideas out-of-hand simply because they follow paths outside the usual way of thinking. We hope that some of our readers will be stimulated to follow up the author's suggestions. It would certainly be desirable to have independent investigators determine the reproducibility of the unusual phenomena described.

H. Mislin  
H. P. von Hahn

### Biological and physical evidence for gravitational waves

by F. Schneider

Burgstrasse 7, CH-8820 Wädenswil (Switzerland)

**Key words.** Gravitational waves; cockchafer; ultraoptic orientation.

Gravitation has been shown to have the characteristics of waves. This is one of the results of a 27-year research program on the ultraoptic orientation of the cockchafer (*Melolontha vulgaris* F.) and subsequent purely physical experiments. The waves in question may be named gravitational whirl waves (GWW) and must be distinguished clearly from those gravitational waves derived theoretically from the general theory of relativity. In contrast with the latter their existence can easily be demonstrated by appropriate experiments. This statement will have some uncomfortable consequences. Gravitation pervades matter and the gravitational oscillation pattern varies in space and time. No point exists where physical or biological experiments could be executed under really steady conditions.

As early as 1957 there was good evidence that cockchafers perceive magnetic fields<sup>1</sup>. This discovery could be confirmed later on by different authors using other organisms like bacteria, planarians, termites, flies, bees and birds. In the meantime I developed other techniques to study the ultraoptic reactions of *Melolontha* since another kind of subtle but pervasive physical information proved to be superposed on magnetic orientation. The beetles did not prefer a definite position with respect to the magnetic field but varied their angle systematically<sup>2,3</sup>. Then I came to realize that gravitation must be involved. Orientation could be improved significantly when blocks of lead were put near the subjects<sup>4</sup>, and the systematic turns continued even in Mu-metal cylinders screening magnetic fields<sup>5,6</sup>. In many instances there was a clear relation between the distance from the underground cellar wall and the direction and speed of turning<sup>5,6</sup>.

Owing to some physiological peculiarities, their handy size and the clear marking of the body axis, cockchafers are predestined as appropriate subjects for the study of ultraoptic influences on animals. We dug them out at the end of winter and kept them for several months in a hibernating stage. When they are transferred to the laboratory the abrupt increase of temperature leads to transitory activation but the beetles tend to return to their immobility and retract their antennae. In this critical phase the sensitivity to ultraoptic stimuli reaches its maximum. The transition from the active to the resting stage is not random but it can only proceed at definite moments, at certain points in the room and at definite angles to magnetic and electric fields and gravitational waves. This behavioral conformity with the direction of applied and hypothetical physical influences suggest a clear geometrical structure of appropriate sense organs. On the other hand it makes possible the systematic tracing of hitherto unknown physical actions.

The overwhelming purely mechanical action of gravitation and the well-established field theories referring to this seem to exclude any divergent interpretation. How can the wall of a building, a wall of an aluminium box or a block of lead influence the gravitation field perceptibly, if the effect of 40 kg of lead at a distance of 16 cm is about  $10^{-8}$  of that of the earth? There seems to be no reason for controversy or even for discussion. Are our experimental results from the viewpoint of energetics realistic? But like all scientific theories the theory of more or less static gravitational fields is merely a provisional description of what we believe is happening and existing. This account has been generally accepted for centuries but recent re-