At a conference on fluid dynamics in biology at Seattle in 1991, Sir James Lighthill gave a lecture with the title ‘*Acoustic streaming in the ear itself* ’.

Aided by the suggestions of leading experts in cochlear research, Lighthill illustrated how, in his opinion, acoustic energy by both a fast and a slow wave might be transported inside the two adjacent tubes that are separated by a flexible partition.

The figure on this page – Fig. 1 in the booklet ‘*Applying Physics Makes Auditory Sense* ‘, a reproduction out of Lighthill’s paper – gives a schematic overview how he hypothesized the fluid behavior inside the cochlea.

His attempt was based on an impressive number of calculations related to various cochlear models, consistently maintaining the presumption of Von Békésy that a traveling wave carries the sound energy to a specific place on the basilar membrane in a two compartment cochlear model.

But, from a physics point of view: ignoring either the influence of the Reissner membrane or the existence of the scala media as the third cochlear compartment is not permitted.

The hypothesis, originally initiated by Von Békésy and again assumed by Lighthill, that the dimensions of the scala media – the endolymph filled duct that lies between, and actually separates the perilymph filled scala vestibuli and scala tympani from each other – can be ignored as a contributing factor in the hydrodynamic behavior of the perilymph movements inside the cochlea, is fundamentally wrong.

And it is precisely this misinterpretation that has led cochlear experts to accept the attempt by Lighthill to theoretically explain the hydrodynamic energy flow inside the cochlea.