

What's in a word?

Brian Dale¹

Centre for Assisted Fertilization, Naples, Italy

To mark the 20th edition of *Zygote* I felt it appropriate to include this paper by Professor Herranz from Spain on the origin of the words zygote, gamete and embryo. On reading this manuscript it came as little surprise to me that over the years the passage of information has distorted the origin of these terms and assigned merit to other more popular authors. Professor Herranz has painstakingly reviewed the literature, using both the Internet and hard copies, to get to the bottom of this argument, and in doing so has raised two questions of fundamental importance to science, the misappropriation of ideas and the incorrect use of biological definitions.

As a student of reproductive biology in the early 1970s, one of the cardinal rules in science was a thorough search of the literature before starting a project, which in those days was a wonderful trek through the dusty archives of the library of the Stazione Zoologica, Naples. In to-day's computer age, a literature search is more probably post-experiment, with a push of a button on PubMed, to collect a list of 'relevant references', often only spanning the past few years, which may hopefully be read before being cited. Certainly, the idea of science is to create and amplify new ideas and concepts and I would agree, that we should not fog our innovative instincts by too much detail. Scientists have been observing gametes and embryos for centuries and, although in the past diagnostic tools were not available, our forebears most probably had the same thoughts and ideas as to how biological processes came about. In the 1980s, when my group in Naples discovered the novel idea of sperm activating factor in sea urchins, it was quite a surprise to find that scientists such as Lillie and Robertson, 70 years earlier, had been battling out contrasting theories on egg activation, one being a soluble sperm factor. Most probably, Hertwig, Fol and Boveri from the preceding century triggered these Edwardian scientists' imagination, while who knows what Spallanzani and Leeuwenhoek had in their minds centuries before.

Many governments, over the past 20 years, have been forced to legislate the ever expanding field of

human assisted reproductive technologies, leading them to attempt to define the beginning of human life. In some countries, theological beliefs have influenced these legislators, leading to often irrational and unfair laws that have created grave restrictions for infertile couples. Some would argue that philosophers and ethicists should define the 'beginning of life', not politicians. Science is impartial, embraces international and religious boundaries and is one of the bases for human intellect and curiosity. The beginning of human life has been defined by some legislators to coincide with the formation of the zygote, obviously confusing this stage with that of the embryo. Irrespective of who undertakes the onerous task of defining when life starts, the definitions drawn from science over the centuries and the mass of new information that is continuously generated in the fields of biology and embryology need to be consulted.

Nobody would fault the advantage of computer-generated literature searches and, indeed, specific programmes to detect duplication of texts to help limit plagiarism; however they do not address the more serious problems of misappropriation of ideas by ignoring past publications or that of extrapolating data from one phylum to another, so as to re-invent the concept of, or indeed blatantly falsify, results. *Zygote* was founded 20 years ago with the aim of publishing work on the identification of basic biological processes in early development, drawing on multidisciplinary research on gametes across the animal kingdom. It is our obligation as scientists, reviewers and editors not only to teach the new generation of scientists to put science in a historical perspective and give due credit to our forbears, but to document and explain to the lay population, including politicians, biological definitions and concepts.

I would like to thank Professor Jacques Cohen for his help over the years as North American Editor and wish him every success with his journal *RBM Online* and welcome, as the new North American Editor, Professor Jonathan Van Blerkom, another international authority on early development in mammals and humans.

¹All correspondence to: Brian Dale. Centre for Assisted Fertilization, Via Tasso 480, Naples, Italy. e-mail: brian.dale@virgilio.it