



57

Welcome to **ATTACK!** a two-page occasional publication. Most of **ATTACK!** will be concerned with the holistic curriculum which, if acted on, is a fundamental way to undermine the present undemocratic education system. Don't be discouraged if opportunities to teach holistically are limited, do your best, be a guardian, and act as a witness to this culturally significant and inspiring way of teaching and learning. **ATTACK!** is a partner to <https://networkonnet.wordpress.com>

Attack! 57 Developing a case for the earliest learning of science and, of course, music, art, drama, and all the rest Part 3

Mark Cosgrove is a New Zealand teacher-educator and was Head of the School of Teacher Education, University of Technology, Sydney.

In a 'light and sight' case study one boy suggested that sight worked by the eye sending out light to an object. This is not a very common idea as there is an obviously more fruitful theory, that sight is the capture of information by the eye as light from a source is reflected to the eye. This boy may have been finding out about how bats 'see'. Bats use sound which they make and emit, and the reflected sound is detected by a sonar 'eye' then transferred to the brain. The test used here would be found in the third type of experiment, 'Is it this or is it that?' a simple test is to ask the learner if he or she can see in the dark.

The learners using these tests need to be both methodical and imaginative; scientific flare can be seen in the quality or imagination in the ideas generated or the test proposed, or both.

Scientists aim to add to, improve, refine their descriptions of happenings, processes, and information available in the universe. This is essentially carried out generatively: ideas, hunches, and guesses about an event or object are put forward and then looked into, tested, and evaluated. If found to be supported the learner adds that outcome to his or her existing knowledge and if found to be weak or not supported by the evidence, further ideas can be generated and looked into, but not necessarily straight away. Pure neuroscience!

Some teachers ask what learning was like before scientific thinking became commonplace. This following story helps:

The horse's mouth allegory derives from a discussion some centuries ago amongst a group of scholars seeking to know how many teeth a horse has. This has set up the question, 'How many teeth does a horse need?' To lead to the answer, after learned debate, a novice scholar asked the impertinent question, 'Why not have a look in the horse's mouth?' This direct approach may not have been favourably received; it was not the method used by those scholars to solve problems such as this one. However, it is direct and able to be tested.

This caricature may have been the origin of the common saying, 'Straight from the horse's mouth'. It helps to make clear the distinctiveness of scientific thinking. Nowadays, scientific thinking is so pervasive that it is present in almost all aspects of cultures. For example, in the legal and justice system, science-based forensics is used in crime detection to greatly assist the legal people to make safe judgments. Medicine is safeguarded by extensive scientific testing. Food production is closely monitored by scientists.

Science is predominant in the culture. Thus, it's up to responsible educators to adopt the mantra of leaving no gaps, and school education offers learners a valued paradigm in which they can generate and evolve and develop as coherent a view of reality as possible. The case for science, presented here, should not deflect thinking teachers from including music, art, linguistics geography, history, and so on, in their programmes. One facet of neuroscience, studies of the infant brain, helps teachers to justify early learning of the widest kind. There is no hierarchy of knowledge in this view of education.



Acknowledgements:

The main ideas in this article came from a TV program, 'The Brain' by David Eagleman. Gerald Edelman's theory of neuronal group selection as a mechanism for learning has also been useful.

