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The idea of a bionic eye sometimes seems to be in the realms of science fiction but many people, mostly engineers of various sorts but also physiologists and experts in computers, all over the world are energetically attempting to create just such an eye. Different organizations including NASA are involved in the development and where applicable, possible commercialization and provision of such technologies to better treat disease and also help humanity. In the future the demands of space travel are going to create a whole new set of problems in terms of human safety and performance in hostile environments, hence the interest and involvement of various private and public space-related agencies such as NASA. Many scientists with diverse backgrounds are using human and animal eyes to study, in great detail, vision and related functions such as eye movement and create robotic systems that use cameras and charge coupled devices (CCD) and even electro-mechanical versions of extra-ocular muscles that are capable of moving one or more eyes in a roughly human-like manner, thereby coordinating the actions of, say, two model eyes to simulate binocular vision.

Ceramic-based photodetectors or artificial retinae are already in place in animal and human eyes and researchers are working to improve their performance. Some of these devices are thin film technology that is grown atom by atom on a ceramic substrate and they appear to be biologically compatible with the human retina and safer than other alternatives using for example, materials such as silicon. The ceramic photodetectors are the size of cones and are so small that they cannot be easily manipulated manually and so they are implanted in a polymer that dissolves in the retina to leave the artificial photocells behind. Then the brain has to learn to make sense of the new sensory input which is, of course, not a simple matter but the scientists involved are hopeful that such learning will occur and that the whole process of effective adaptation to the vision prosthetic will become better understood with time.

Surgical procedures that embed electronic and mechanical devices in the damaged eyelids of humans can restore effective blinking or maintain eye closure and recently other advances in identifying genes responsible for myopia have occurred with a major promise that in the future genetic treatments to prevent myopia development will become much more feasible and effective. Huge changes are also happening in technology for eye and vision assessment and within short periods, probably even less than two years now, the content of almost all structured educational courses in universities are already largely outdated or even irrelevant. Trying to revise such courses with any regular frequency in an attempt to keep up with the very rapid changes and advances in modern science is probably going to become a largely futile, and almost super-human, effort. Learning for humans will have to shift towards using other methods of learning and particularly of information access and awareness, as against the more formal approaches still so common in modern schools and universities. An emphasis on the fundamental issues, principles and methods within particular fields of study including, of course, optometry will become even more critically important and academics and others will have to find their way through the ever-expanding maze of shifting information and knowledge. People in general will need to become very much more sophisticated in terms of understanding and analyzing critical information and differentiating such information and knowledge from all other information of lesser importance; and the emphasis in schools, universities and society itself will need to be placed on giving people the necessary knowledge and skills, whatever they may be, to facilitate that task.

Alan Rubin
Editor
Department of Optometry
University of Johannesburg