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## **DISCOURSE**

### **Learning from the first Australians**

THE WISER OF THE early European settlers and explorers used Aboriginal knowledge of the local flora and fauna to build up Western scientific knowledge of an unknown continent. And this process continues.

But not all see the Aboriginal contribution to science this way. Take, for example, the huge bicentennial volume compiled by the Australian Academy of Technological Sciences and Engineering, *Technology in Australia, 1788-1988*. In its 1017 pages, there are only three references to Aborigines. Among them is the following:

"By the time Governor Phillip set foot in Farm Cove, our vast continent had been occupied for 40000 years by the Aboriginal people, during which period there was very little evidence of technological ingenuity.

The writer goes on to point out that the Aborigines built ingenious fish-traps, primitive instruments and stone shelters, but that mineral resources such as metal ores and fossil fuels had neither been identified nor used. Thus there is an implication that Aboriginal people could only cope with "low grade" knowledge and could not excel in academic subjects such as science and technology.

These two views can be put as formal hypotheses:

- Aboriginal people lack technological ingenuity;
- Aboriginal people cannot cope with modern science and technology.

According to philosopher Karl Popper's ideas on verifying scientific hypotheses, it only takes one counter-example to expose a hypothesis as false. So, to falsify the first hypothesis we could look at the invention of the boomerang. I have been able to track down at least one doctoral thesis, four books and numerous articles that deal with this particular invention. Some of the articles on the flight of the boomerang need an understanding of Year 12 or even degree-level physics. There are also papers about the didgeridoo, the woomera and the bull-roarer, all of which are Aboriginal inventions. In addition, Aborigines have an excellent understanding of the uses of native plant and animal life. The recent publication of an Aboriginal Pharmacopoeia by the Aboriginal communities of the Northern Territory and the popularity of the ABC television series *The Bush-Tucker Man* testify to the wide Aboriginal technological knowledge of this area.

IN THE mid-1970s, David Lewis wrote, several articles about the uncanny ability, of Aboriginal people to find their way in apparently featureless country. More recently, studies have shown that urban Aboriginal children have a superior sense of direction to their white Australian contemporaries. All of this provides sufficient evidence of Aboriginal technical ability to abandon the first hypothesis.

To falsify the second hypothesis, we need to find one or more examples of Aboriginal people who have successfully mastered Western science to a degree of excellence. There are, in fact, two well-reported examples of Aborigines who achieved success in science and technology. David Unaipon (1872-1967) invented a device for converting linear into straight-line motion. He applied his curvilinear discovery to sheep shears, and obtained an Australian patent for it in 1907. He also predicted the invention of the helicopter in 1914, even though the first helicopter was not built until 1930.

Eric Willmot, a teacher and administrator, invented a variable radio transmission system which won the 1981 Channel Nine Australian Inventor of the Year Award. The histories of these two inventors and of other Aboriginal scientists should dispose of the hypothesis that Aboriginal people cannot cope with Western science.

PART OF the reason for the lack of recognition of Aboriginal technological achievement by European settlers is in the way each culture approaches science. Let me give an example. In 1968, F. Hess studied the aerodynamics of the boomerang. He wanted to find out if the equations he had devised for the boomerang's flight were correct.

He made a groove in the central portion of a boomerang into which he fitted two small batteries and connected these to a torch bulb on one of the wings of the boomerang. Then he threw the boomerang at night and photographed it. He compared its flight with the paths predicted using the equations and found a good match.

A comparison between the skills of an Aborigine who carves and uses a boomerang and the methodology of the Western scientist illustrates the mutual difficulty of understanding. What would an Aborigine have thought of a person who was trying to throw a boomerang at night?

Yet, despite these difficulties of understanding aims and purposes Aboriginal students could well be interested in using Western science to find out more about a topic with which they are already familiar, such as the boomerang.

When I asked science advisers in each state or territory, what they were doing about Aboriginal science curricula, I was able to get information from only three governments- NSW, the ACT and the Northern Territory. The ACT had made a lot of headway. Its Department of Education has published a magnificent booklet entitled *From Ochres to Eel Traps* which illustrates, through a number of simple experiments, how Aboriginal science can be transferred to a Western classroom.

A recent educational survey found student teachers held negative views or stereotypes of Aboriginal people despite positive feelings about Australians as a whole. The good news is that Aboriginal studies are included as Year 12 examination subjects in some states. Future generations of student teachers may have a better image of Aboriginal people.

A more positive media coverage of Aboriginal events with a scientific slant would help. *New Scientist* recently has had examples- using science to restore Aboriginal paintings, the "first Australians" as seafarers, and the Aboriginal view of mining in Kakadu.

However, we need to go further. We should use the above examples and many others to provide positive images of Aboriginal science and technology in the science syllabi for all Australian children. Likewise, we should ensure that Australian children are as familiar with the names of Unaipon and Willmot as they are with the names of other scientists with Australian connections such as Joseph Banks and Frank Macfarlane Burnet.

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