



## OFFICE OF THE PRIME MINISTER'S CHIEF SCIENCE ADVISOR

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### **Sir Peter Gluckman's Opening Address to the Public Symposium: Engagement of Indigenous and Western Science Knowledge Systems**

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#### **The Epistemologies of Scientific and Indigenous Knowledge Systems**

I welcome those who are not New Zealanders to Aotearoa-New Zealand. This symposium is being held in our National Museum of which I have the privilege of being a board member. As a repository of knowledge and memories, *Te Papa* is one institution that is leading the way in trying to address what is a complex subject for all of us and one that is critically important as we think about the future of our nations: namely, how to respect and engage those epistemologies that have their basis in heritage, tradition and identity but may be perceived by some to not align with dominant societal views.

While this symposium is focused on the particular place of Indigenous Knowledge, the underlying question has a much broader dimension as, even within so-called western societies there is a wide spectrum of sources of "knowledge". I am proud that *Te Papa* reflects the many human trajectories and cultures that have led New Zealand to where it is today and that it is trying to be honest in documenting what for many – particularly Maori – has not been an easy journey.

Our challenge as human beings has always been (and remains) to try and understand the world around us and what makes us what we are. And we all come to know different types of things in different ways – by belief, by tradition and culture, by observation or by the processes that we now call science. The reliability of each pathway to knowledge may be judged differently by different people, depending on the context and the framing we may wish to apply.

Of course, the reliability of some facts causes little debate – for example the presence of gravity or of Newtonian physics. But once we move into environmental, biological and the social domains of knowledge, the co-existence within a society of very different assumptions about the determinants of what should be considered reliable knowledge becomes a reality and the conclusions that different people may reach can be irreconcilable.

We have seen such examples in the divided attitudes to evolutionary biology, driven largely by religious perspectives, or in the divergent views of the causes of mental illness because of different framing, or in very practical matters such as water

fluoridation. The last example highlights the complex relationship between knowledge and pre-existing biases that we can all have for a variety of reasons.

From me it is not possible to enter this conversation without focusing on science as an epistemology – that is, the means by which knowledge is produced and acquired. Modern science claims qualitative differences to other sources of knowledge in that it intentionally tries to isolate itself - through its processes - from other influences on what philosophers of science refer to as truth claims. It is this quality that allows science to be generally seen as a universal. Let me expand.

The social anthropologist Jonathan Marks<sup>1</sup> has defined science as “the production of convincing knowledge”. *Production* emphasizes that science is an active process of constant knowledge refinement. But the word *convincing* implies that there is a social process at work here, beyond mere discovery or fact production. That is, there is a normative threshold and a collective or individual judgment call over what it takes to be ‘convinced’. So inherent in modern science are the methods of experimental design, analysis and verification that are formalized in such a way as its conclusions can become broadly convincing.

Science as we know it today developed from the fundamental shift in intellectual thinking that occurred with the Enlightenment, such that science focused on using validated observation as the basis of producing convincing knowledge and separated the analysis and interpretation of observation from the filter of values. This contrasted with other systems of knowledge at that time such as religion and natural theology that relied on values and belief for interpreting reliability and providing interpretation.

But this does not mean that science is values free. Our human values and personal ethics will inevitably inform the many choices that we make in the practice of science: what we choose to research; how we research it, how we interpret it; and most importantly, how we use the knowledge produced through science. But in the past 200 years, the techniques of science have crystalized into formal processes explicitly designed to ensure the collection of data is robust and analysis follows protocols that can be replicated and thus tested and validated by anyone. This submission to testing and retesting – across borders, generations and cultures – is what gives scientific knowledge its generally accepted reliability and universality. Indeed, progress in science particularly over the past 100 years has been about understanding and refining those processes on one hand, technological developments on the other and, by using these developments, massively enhance our understanding of the world around us, and within us.

But by the middle of the 20 century this formalization of science had also led to the science community’s arrogant view of itself as isolated and somehow above the rest of society. Indeed, the sociologist, Robert Merton described science in 1942 as an autonomous culture standing aside from society while nonetheless informing it. This view endured into the post-war era, but over the past 20 years it has been

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<sup>1</sup> Jonathan Marks, Why I am not a scientist. UC Press Berkeley 2009

recognized as outdated. Today's science is necessarily embedded in society, allowing for and indeed requiring the conversation we are now engaged in.

But while science must be free of values in its core processes, this does not mean that science is or can be free of values in how it is interpreted and used. We all place knowledge in a frame of reference in order to make sense of it. But if we are not explicitly aware of our frames of reference, the result can be heavily influenced by confirmation bias. This is the tendency to reject whatever doesn't support our prior beliefs. And this is a particular challenge as science addresses questions that impact on domains such as the environment, health and social issues, which can be highly charged territory, depending on our frames of reference.

So when we come to connecting science with Indigenous and indeed other frames of reference, there can be multiple challenges. While science tries to remove values from its collection and interpretation of data, other sources of knowledge, by their very nature, do not.

From within both knowledge systems we might ask: if it is so challenging, why bother to seek mutual understanding? The answer is that science is part of society and as societies everywhere embrace their cross-cultural realities and post-colonial obligations, science – to be of any societal value – must be embedded within these societal discussions and processes.

But the fundamental challenge is in the very different knowledge systems co-existing without contradicting to the point of conflict or impasse. And this largely comes down to: understanding the basis of differing epistemologies; respecting different frames of reference; avoiding hubris and arrogance from any perspective; recognizing the biases and values filters that different epistemologies use to judge the reliability of knowledge and truth claims.

As I have said; science, over the centuries has been refined to recognize and mitigate the influence of values in producing knowledge. Other ways of knowing may position values and tradition at their very heart. Our challenge is to come to a meeting place on the reliability and acceptability of variously derived knowledge and what elements from each knowledge pathway will inform the whole and create a better society.

I have used the word "acceptability" advisedly. This is because the inherent philosophical distinction between the scientific domain and other epistemologies still has to be reconciled at the societal level. This may be seen most clearly in trying to develop evidence-based policy and programs in the social sector, particularly those aimed at diverse populations. In such efforts, the definition of success (and thus of outcome measures) may be very different depending on whose lens one chooses to look through. The reality is that solutions have to be seen to work through both lenses. Whether it is what New Zealand's Sir Mason Drurie calls the 'braided rivers approach,' or what Canadian Elder Albert Marshall has termed 'two-eyed seeing', it is an essential effort by both parties to come to an enabling understanding. But that effort will be greatly aided and made easier if we first identify and acknowledge the inherent differences in types of knowledge.