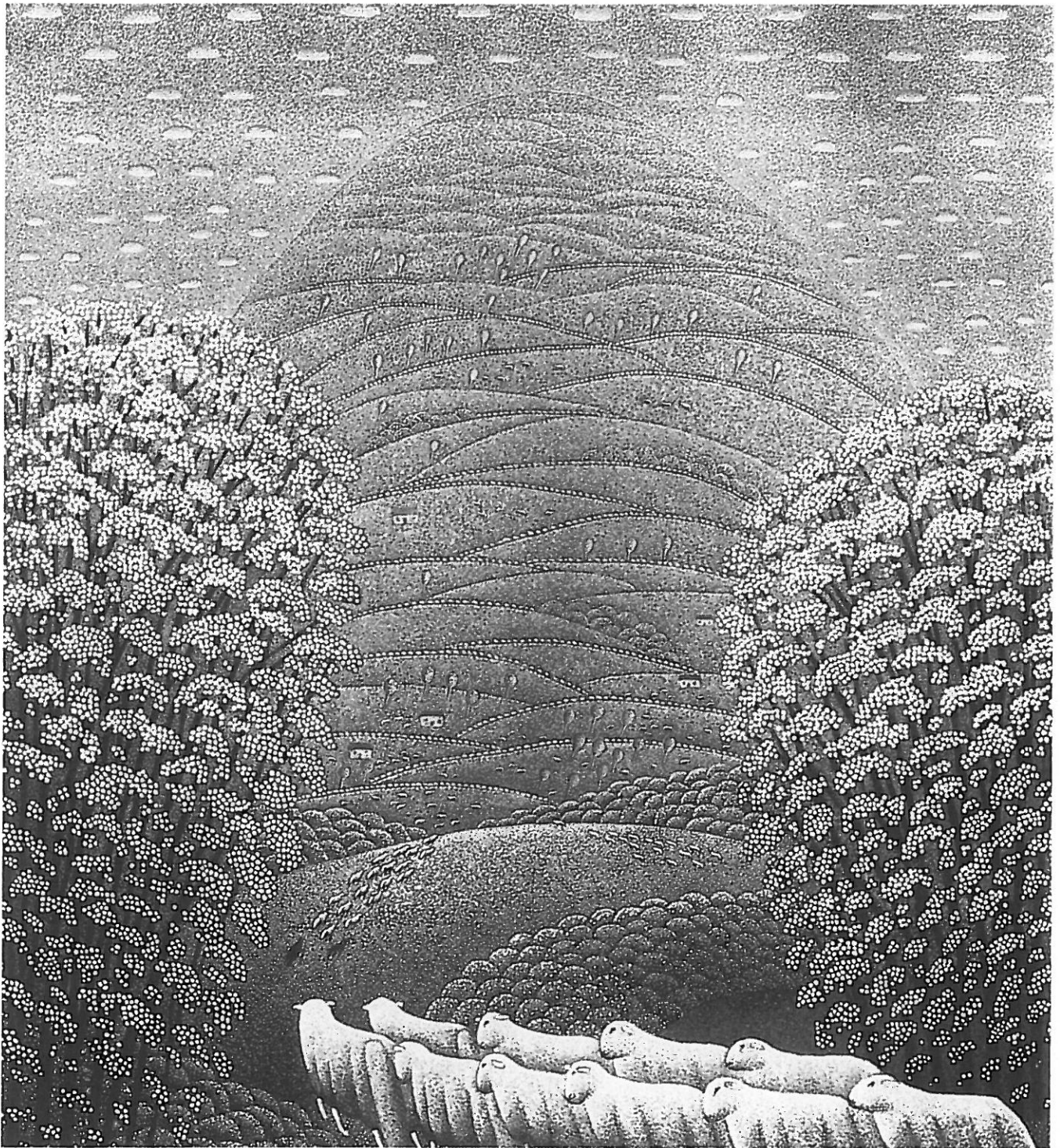


resurgence

January / February 1999 • No. 192

£3.95 • US\$7.00



THE LANGUAGE OF ANIMALS
BARRY LOPEZ • ANDREW SIMMS • FRITJOF CAPRA
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LIMITS OF LOGIC

MUCH TOO OFTEN, we are guilty of monumentalizing historical persons. As monuments, these people stop being persons, and instead function as placeholders. Monuments can be placeholders for that which is good, or that which is bad. Depending upon one's predilections for such phenomena as "The Enlightenment" and "The Scientific Revolution", one is likely to place either wreaths or garbage at the foot of the monument that is René Descartes. To his credit, Keith Devlin does neither in *Goodbye, Descartes*.

In the post-war era, trendy circles often find Descartes to be the convenient whipping-boy for all that is wrong with our relationship to the natural world: the subject-object divide, a dispassionate attitude, hyper-rationality, and a context-free world of practices. This use of Descartes ultimately means that no longer does anyone seriously examine his work or closely trace its ramifications. Instead one just evokes his name as the locus of rationality, the site of the Enlightenment, or the turning point from enchantment. Devlin's book provides us with an opportunity to examine the evidence — a history of the claims made about language and logic that lead to the hypothesis of artificial intelligence (AI), and a well-evidenced narrative account for why AI fails.

Devlin tells us that "despite the title, this book is not about Descartes." Instead, this book is about the fact that the Cartesian world-view has run into "the language wall" and "the logic wall". According to Devlin, any world-view, no matter how useful, eventually runs its course (although he does privilege his own discipline, mathematics, when he says that the truths of physics, chemistry and biology are ephemeral, but mathematical truths are universal in time and place).

"Cartesian science and mathematics have taken us a long way in our understanding of the physical world. They have also provided us with significant — though hitherto far less useful — insights into the world inside our minds. But there is

Kirk W. Junker explores the relationships among logic and communication.

**Goodbye, Descartes:
The End of Logic and the
Search for a New Cosmology of
the Mind**

KEITH DEVLIN
John Wiley & Sons, Chichester, 1997,
£17.95

growing evidence that, when it comes to the human and cognitive sciences, we are reaching the limits of the understanding that can be achieved through the traditional tools and methods of science and mathematics." That, according to Devlin, is where Cartesianism is; hence the subtitle *The End of Logic and the Search for a New Cosmology of the Mind*. It is time to find a new world-view, a new "cosmology of the mind". He asks "If Descartes was wrong . . . , what are the possibilities of a science of mind and language, and what kind of a theory should we be looking for?"

Devlin answers this in his chapter "Communication Is the Key". Here, however, his answer is only partial. He pays no attention to a part of history which might help him — the tradition from the humanities — when he says that "the birth of linguistics marked a separation of the study of language from logic — the study of reasoning." Long before linguistics, that separation was the focus of heated discussion among the ancient Greeks, when the sophisticated world-view, based upon the linguistic practices of rhetoric, went its own way, amid resistance from the philosophers. So, for instance, if one considers language in the tradition of the humanities, it comes as no surprise that the original assumption of artificial intelligence — that it could be achieved because language is symbol manipulation — was destined to undermine the project. In the humanities, structuralists before the war already had persuasively argued that the words of (natural) language were not a series of one-to-one representations of the material world.

DEVLIN DOES NOT just talk about artificial intelligence as an historical phenomenon, but instead he explains what was and is artificial intelligence: "the enormous power and utility of present-day computers should not blind us to a very fundamental fact about the way they work. The *only* thing that a digital computer can do is manipulate symbols in accordance with a set of precisely defined rules stipulated in advance. To the human user looking on, it might seem that those symbols *mean* something or *refer* to something in the world, but, like beauty, that meaning or reference is in the eyes of the beholder and not in the computer."

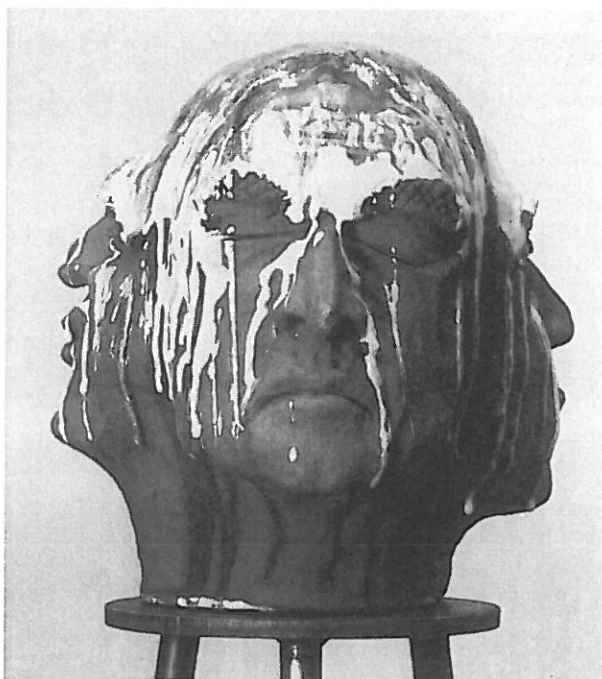
The first two chapters provide the reader with a detailed, though compelling, historical introduction to logic, both from the Stoic and from the Aristotelian perspective. Indeed, the book's aim is to provide an "overall story". This is one of the strongest points of the book, and it makes the book accessible to a lay person's understanding of logic or language. The story is an historical one that leads from the beginning of logic in ancient Greece to the end of logic when it hits the language wall in the project of artificial intelligence.

Although it takes a while for all the evidence to be laid out, early on he disposes of the ideas that reasoning and communication are mathematical. This historical treatment is particularly welcome, since the fields of logic and mathematics are too often studied as ahistorical utilities. This introduction serves as a helpful foundation for the later unpacking of the meaning of Descartes' work. Rather than providing broad sweeping dismissals of Descartes, as so many popular books are apt to do, Devlin's approach is careful, but not pedantic. Devlin demonstrates that we have come to a break in the "progress" of artificial intelligence — one that requires a rethinking of the foundation of the enterprise (hence, goodbye to Descartes), not just a tweaking of the dials and fine tuning of the circuit board:

"The original goal of machine intel-

ligence is not possible, at least in terms of a program running on a digital computer, because human intelligent behaviour involves *knowing how*, and *knowing how* cannot be reduced to *knowing that* . . . the field of AI attracted some of the smartest thinkers around. When so many very bright minds, provided with enormous resources, failed to achieve their goal, it makes sense to look for a reason. And the most obvious explanation in this case is that the goal is an impossible one."

ONE OF THE PERSISTENT questions in writing for popular audiences, including science and maths writing, is "What audience?" That is, who is to be addressed in raising both propaganda on behalf of science, and scepticism about science? Often the answer given to this question is "the interested lay public". Likewise, when asking "Who is the audience for this book?" I would be tempted to say the interested lay public. At places where Devlin feels that his explanations might become a bit too difficult to understand for the uninitiated



Sculpture (1993) by Thomas Schütte, from the book Thomas Schütte published by Phaidon, London

reader in logic, mathematics or linguistics, he adopts the style of a popularizer and provides warnings to omit several pages, or takes pains to make use of the answer in a way that makes sense even if the reader did not understand the problem.

Another element of popular writing, humour, is evident as well, as when he comments that Plato's ad-

monition to keep the method of logic from young minds puts logic into the same category as "pop music, horror comics, television, cannabis, video games and the opposite sex". In addition, the readability of the text is facilitated, for instance, when Devlin is able to make do with common, rather than specialist, definitions of two of the most important terms for the book — *logic* and *rational* — which he defines from the *Oxford English Dictionary*.

Nietzsche warned us not to monumentalize history. Devlin provides an alternative way in the history of ideas, rather than that of human monuments. What we do, once we come to recognize the limits of Descartes' thought (other than storm

the castle with righteous torches), is left open for the interpretation and consideration of the reader. ●

Kirk W. Junker is a lawyer and a lecturer in Science Education for the Open University. He is a co-editor of Communicating Science: Professional Contexts, Routledge, 1998.

PHILOSOPHY OF FREEDOM

Thomas H. Naylor introduces David Hume on the modern unitary state.

Philosophical Melancholy and Delirium

DONALD W. LIVINGSTON
University of Chicago Press,
1998, \$25.00

THERE IS A HIGH PRICE to be paid for our uncritical affirmation of bigness, global interdependence, universal solutions to political and economic problems, dehumanizing uniformity, and standardized mass production. Size, entangling alliances and technological complexity are not risk-free. And Scottish philosopher David Hume (1711-1776) figured out most of this long before the rest of us.

For anyone seriously interested in the historical origins and fallacies of a large, modern unitary state such as China, India, Russia or the United States, *Philosophical Melancholy and Delirium* is a must read. Employing Hume's distinction between "true" and "false" philosophy, Professor Livingston strips bare the philo-

sophical hubris and self-deception of the centralized, consolidated modern state. For Hume, "false philosophy leads either to melancholy over the groundlessness of common opinion or delirium over transcending it, while true philosophy leads to wisdom."

Although Hume did not have a theory of secession, his theory of the

state as a "federative polity of great social orders united and operating by concurrence, not majority will, and capable of frequent resistance to encroachment is logically compatible with secession, whereas secession is logically unthinkable in the framework of the modern state."

Therefore, it was not surprising that Hume supported the secession of the thirteen English colonies in America from Britain as early as 1768, several years before they were prepared to take that step themselves. His image was also reflected in the original Continental Congress and in the American Articles of Confederation — an important precursor of the US Constitution. If the compact theory of government espoused by American Presidents