

A number of application papers are also presented, largely in biomedical, biological and financial contexts.

Since this volume contains a large number of research papers on many topics, no one is likely to find every paper in it useful or interesting in her own research. On the other hand, those who want to know what is going on at the frontiers of Bayesian methodology, theory and application would benefit greatly by dipping into this book, reading the abstracts, and then reading more closely those papers that pique their curiosity.

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Lange and Nietzsche by George J. Stack. Walter de Gruyter, Inc., 1983. 341 pp. \$143.10 (hardcover). ISBN 3110088665.

According to Stack, when Nietzsche first came across Lange's *Geschichte des Materialismus*, he referred to it as a "treasure-house" of ideas. Much the same could be said about Stack's book itself. It is very rich and dense in ideas and well repays a second reading. We state at the outset that neither of us are Nietzsche scholars, and, hence, we will not comment on Stack's scholarship (which seems excellent), nor on the major argument of the book, that Nietzsche was strongly influenced by Lange (which seems persuasive). Instead, we shall focus on Nietzsche's efforts, as articulated by Stack, to comprehend the nature of science in the light of neo-Kantian epistemology.

Nietzsche thought very deeply about science and about philosophical issues that pertain to science. In some ways, Nietzsche's views on science are deeper than the thinking of many 20th Century philosophers of science, the latter of whom are still very much under the influence of pre-Kantian Philosophies, such as Humean Empiricism, logical positivism, and its offspring, analytic philosophy, which dominates American and British philosophy today. The hallmark of pre-Kantian Philosophy, whether it occurs chronologically earlier or later than Kant, is that it treats sense perception as putting us in direct and immediate touch with an objective, external reality. This is the unreflective view we all hold in the course of everyday living. For we all believe that the objects we see around us are real, that they exist more or less as we see them, and that neither our sensory apparatus nor our minds structure or contribute to the content of what we see. Our eyes are our windows to the world, and our eyelids function as shutters. Just as opening the shutters gives us direct and immediate access to

the outside world, so opening our eyes allows the homunculus (read: "little man") within to peer through the body's eyeballs and thereby gain direct and immediate access to an objective physical reality, which we call the material world, and which we believe exists both (i) as we perceive it and (ii) independent of the "we" who are perceiving it.

The Empiricist account of knowledge generally take (i) and (ii) to be true. Hume argued that our theoretical concepts are constructed out of, and have meaning only by reference to, sense experience. And there is something quite compelling about this view, especially for scientists. Scientific theories must be grounded in reality; they must be tested empirically by making appropriate observations that confirm (or falsify) the theory. By "reality" is meant "physical reality", and by "observation" we mean "what we observe using our senses". The basic assumption that renders Empiricist accounts of knowledge pre-Kantian is that what we observe using our senses is a physical reality that exists independent both of our senses and the concepts we use in any articulation of our sense experiences. This, it is alleged, is what makes science objective: that the concepts and hypotheses of science can be tested (by use of our senses) against a physical reality (which exists independent of our observing it). Now, to be fair, philosophers of science have long recognized the inadequacy of this simplistic empiricist schema to account for how science works, and some post-Kantian ideas (e.g., the theory laden-ness of observations, or the importance of paradigms in interpreting and evaluating data) have found their way into contemporary discussions. However, this amounts to little more than a sort of tinkering with the basic Empiricist approach: if (i) and (ii) above are not always true, they are mostly true, and the ways in which they are not true can nevertheless be gotten around somehow. But what if (i) and (ii) above are always false? Then philosophy of science becomes difficult, challenging, and very interesting.

Throughout the entire book, Stack continually reinforces the idea that Kant is an ever-present influence in the thought of both Lange and Nietzsche. Kant had argued in his highly influential *Critique of Pure Reason* that our experience of the world does not correspond to the actual nature of reality. Rather, our experience of the world is determined by the structure and physiology of our sensory organs and by the nature of our minds, which transform the raw, unknowable data of input from the external world into knowable and recognizable objects. The result of Kant's epistemology is that the traditional notion of the objectivity of the external world as represented by our minds under normal circumstances is actually an artifact of our minds themselves and is not an accurate picture of the nature of the physical world as we imagine it exists unperceived and independent of us. In fact, the very notion of an experience of the physical as it actually exists is, for Kant, Lange and Nietzsche, a contradiction in terms. Stack describes the situation thusly: "Man never encounters "nature-in-itself", but only a natural world comprehended in terms of percepts, concepts and psychic beliefs" (p. 115). The representation (*Vor-*

stellung) of any given object in a mind is nothing but an effect of the thing itself. Nietzsche saw this sort of epistemology being supported empirically by the science of his time. For example, Helmholtz's writing on the physiology of the eye (Helmholtz was the first person to ever observe a living human retina) characterizes the visual image we associate with the perception of an object as an effect of the object, i.e., not the thing itself. The visual image only bears at most a causal—and not an identity or likeness—relation to the physical object.

So Kant held that our sense-perceptions, far from being clear windows to an objective reality that exists independent of us, are actually structured by, and infused with, concepts that our mind, unconsciously and inevitably, projects onto the world. Nietzsche accepted the Kantian view, added to it empirical considerations about how our senses actually function—considerations which have been very much strengthened in the 100 years or so since Nietzsche's death—and turned it into a quite compelling argument against Materialism. Expanding on Lange's reading of Helmholtz, referenced above, we can give an outline of how a contemporary version of Nietzsche's argument might go: In order for us to see, light, or electromagnetic radiation, enters our body through the eyes. Since there is no "little man" who peers at the world through our eye-balls, and neither is there a "little man" who "perceives" an image of an external object on the retina, we must tell a more complicated story about how and what we see than the simple Empiricist common sense story (the one that we all believe when we are not being critical). The story is as follows: electro-magnetic radiation enters our body and interacts with cells in our retina inducing electro-chemical changes in the cells that propagate along the optic nerve into the brain. (It is worth noting that the incident light never itself reaches the brain.) The brain responds to the signals entering it from the optic nerve by producing a "model," which represents to us an external object as present. We then say that we "see" the object and believe (falsely) that the object we see (which is the content of a perception created by the brain in response to some input) exists as we see it, and independently of us. Now to be sure, there is a "something" that exists independently of our sense experience, but that "something" cannot be what we see when we open our eyes and look. For the latter—namely that which we see when we open our eyes and look—is always the content of a perception (which in turn is always mental). Now, Materialism gives the name "matter", or "material object" or "physical object" to what is really the content of our sense perception, and hence the very concept of matter involves the concept of mind. "A mechanistic physiology inevitably leads to the realization that our sensations and perceptions are not 'copies' or 'representations' of some external object, but rather are acquainted with constituted appearances that may be construed as signs of transphenomenal entities or processes. The world apprehended in sensory experience is not the world, but a system of appearances that exist for us" (p. 137).

As Stack presents their thought, Lange and Nietzsche apply Kant's epistemology in two important areas—the problem of self-knowledge and what

we would now call the philosophy of science. Although these two areas appear *prima facie* conceptually unrelated, Lange and Nietzsche encounter similar epistemic barriers in both. Regarding their philosophy of science, Lange and Nietzsche see the history of scientific endeavor (which for Nietzsche began with Socrates—at best an ambivalent figure in his writings) as a constant striving for knowledge as panacea. But whereas all scientific knowledge, by its very nature, is characterized by reason, concept and an idealized view of nature that must be assumed as a referent for the idealized formulae and concepts used in the science, it follows that scientific knowledge does not describe the world as it actually is. Actual nature, for Nietzsche, is characterized by chaos and becoming; science, on the other hand, is only coherent in a realm of order and being. Thus, science tells us more about ourselves and our rationalizing brains than it does about the actual universe: "The protean nature of transphenomenal actuality, its essentially process character, its chaotic, antithetical 'forms' render it impervious to linguistic description or conceptual formulation" (p. 101).

We would like to think that this sort of impossibility of access only pertains to the mind's understanding of the external world, but in fact, argue Lange and Nietzsche, the problem is even worse when we turn to the question of self-knowledge and attempt to understand the nature of consciousness and selfhood. Nietzsche claimed that there was no reason to postulate a unified self on the grounds of the evidence of experience. For just as our phenomenal representations of the external world are mere appearance, so too are internal mental events only the effects of, i.e., the appearance of, innumerable computations, calculations, decisions and willings at *un-/pre-conscious* levels which are utterly inaccessible to a mind that only knows what conscious (and thus surely not unconscious) experience is like. Thus, the variegated richness of our mental experience—our emotions, desires, wit, aesthetic sense, etc.—is only the tip of the proverbial iceberg. Beneath this surface lies something more fundamental, not necessarily mental and not necessarily physical, that determines the nature and tone of every experience we will ever have. In other words, our sense of self as unitary, holistic, transparent and accessible is for Nietzsche illusory: "'I' you say and you are proud of this word. But greater than this is . . . your body and its great intelligence, which does not say 'I' but does 'I'" (p. 98). Just as the physics of his time supported the position that the most fundamental elements of the physical universe were "force-points", Nietzsche suggested further that what we understand as our consciousness is actually the result of an innumerable number of individual "will-points" which each add one shout to the cacophony of desires and drives that underwrite all human action. It should be noted that Nietzsche does not, according to Stack, wish to claim that his theory of will points creating an illusory self is to be taken as metaphysical fact—this would contradict his perspectivalism. He does want to argue, though, that in disputes regarding the truth of the matter, the burden of proof should lie with those who argue that there is a naturally unified self.

There are further anthropomorphic problems with Materialism. Nietzsche asserts that the concept of a "thing" or "body" or "object" is an anthropomorphic projection of our subjective sense of ourselves as a "solid" substance. In the manner of Descartes, we take ourselves to be a "thing" which "thinks" (falsely, according to Nietzsche), and which is the same over time. We then project this sense of unified-thingness onto the contents of our perceptions, calling them "physical" things, in analogy to conceiving of ourselves as a "mental" thing. "The category of 'thing' is not given in experience. Rather, it is modeled after our idea of ourselves as permanent entities or separate, unified subjects" (p. 168). Nietzsche "argues that the concepts of "'substance' and 'thing' have a common origin: they are transpositions of subjective conceptions of ourselves as independent, isolated 'egos' to all phenomena. . . . his basic view is that the categories of 'thing' and 'substance' are derived from our fallacious belief that our ego is a being, a substance or a thing" (p. 201). According to Nietzsche, "we would never have formed the concept 'thing' if we did not take ourselves to be unities" (p. 168, footnote 26). The concept of a thing—a physical thing, if you will—is seen by Nietzsche as an anthropomorphic projection of our (illusory) sense of ourselves as a unity.

Nietzsche thus rejected reductionist atomism at a time when that view was a popular and successful paradigm. Instead, he embraces and explores a theory that replaces the atoms with a theory of "point-forces", first elaborated by Boscovich. And this, as a philosophical theory, is more compatible with contemporary physics than is the atomism Nietzsche rejects. For we know that the concept of an extended unit of matter is inconsistent with the Theory of Special Relativity. If "being extended" or "occupying space" is not a property of the basic units of matter, then we are left with extensionless points. According to this theory, the external world (as well as the internal world) is a dynamic process, rather than a static collection of objects. As Stack puts it, "in terms of the picture of nature presented in the theory of force points, there are no isolated entities of any kind, no 'things', only processes" (p. 231). And furthermore, "if the ultimate constituents of matter are reducible theoretically to point-centers that are assumed to emit force, then the traditional conception of 'clumps' of physical units has been conceptually negated It is astonishing to realize that Nietzsche was one of the earliest thinkers to react to what physicists such as Jeans and Eddington later reacted to: the paradoxical 'dematerialization' of matter in physical theory" (p. 235).

But Nietzsche carried these ideas even further. Force-point is a potential to act upon, to affect, other force-points or conglomerates of force-points. The concept of a "potential" in field theories means just that. In modern field theories one talks of the electromagnetic potential or the gravitational potential—a mathematical function the value of which at each point is a measure of the force the field would exert on any object present at that point. Hence, each point may be conceived as a potential to express power. Thinking analogically, and verging towards pantheism, Nietzsche speculated that "each

center of force has its own perspective or unique interpretation of actuality" (p. 227, footnote).

After affirming that both the ultimate nature of physical reality and the ultimate nature of internal phenomena are unknowable, Nietzsche and Lange suggest, according to Stack, that there must exist some "unknown third" grounding both physical and mental phenomena. This unknown third would be the ontological reason for the existence of both the physical and the mental (this is, for example, the role that Schopenhauer's Will played). Both Lange and Nietzsche saw the science of their time moving towards this transcendental neo-Kantian position. It is thus ironic, as Stack points out, that the materialism of the 19th Century was actually converging with its opposite, namely idealism, in the eyes of thinkers like Lange and Nietzsche. Thus, Lange characterizes his position in relation to the unknown third as a kind of "materio-idealism". This is a transcendental position that affirms that there must be some metaphysical entity that grounds all of reality, but whereas it is forever unknowable, humanity has and will continue to project the character of culture onto the fundamental entities in our sciences and philosophies. In part because of this impossibility of ultimate analysis, Lange and Nietzsche grant poetic license to the zeitgeist of any given epoch and affirm that whichever entity comes to fill the role of this unknown third (e.g., God, force-centers, Spinozan substance, or even Nietzsche's own will-to-power) reflects the myth of that time. For example, Nietzsche understood the atomistic physics of his time—a theory he associated with the cold inevitability of determinism—as reflecting a deep nihilism in European culture.

Here we can see Nietzsche's philosophy of science blending into his philosophical anthropology. Nietzsche sees a close relation between humanity's increasing physical and intellectual power over nature and the dissolution of value and integrity in his Europe. Writes Stack, "The total effect of the advance of the scientific interpretation of the cosmos is demythologizing. Unintentionally, the progressive advancement of science has stripped away all of the veils of illusion that enable man to live and feel joy" (p. 303). Nietzsche's prescription for this malaise—the "aesthetic redemption" associated with the transvaluation of values by the *Übermensch* class—is outside the scope of this review. However, it is of interest to note that Nietzsche thought that the reinvention of myth (for Nietzsche, specifically this is the will-to-power as "unknown third") was a necessary condition for the salvation of his culture.

Now, although both authors found Stack's *Lange and Nietzsche* to be very interesting and intellectually stimulating, it is doubtful that it will appeal to many readers of this journal. The intended audience for the book is scholars of 19th Century German Philosophy, the writing is dense and technical, and many words and phrases are not translated from the German. The prohibitive cost of the book (\$143.10 at www.amazon.com) is a further reason not to run out and buy it. However, most university libraries will have a copy of the book, and for those who wish to dive more deeply into this fascinating material, we

recommend especially chapters V ("Materio-Idealism"), VI ("Human, All-Too-Human"), and IX ("A Force-Point World").

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The Shape of Ancient Thought: Comparative Studies in Greek and Indian Philosophies by Thomas McEvilley. Allworth Press, 2002. 731 pp. \$35.00 (hardcover). ISBN 1-58115-203-5.

In the introduction to his Sourcebook on Indian Philosophy, Sarvepalli Radhakrishnan wrote that there is no instance of Western philosophy that does not find its counterpart in Indian thought. He then compiled his fine reference work to Indian philosophy, but it was not his objective to point out parallels and equivalences to Western philosophical views. It is this lack that Thomas McEvilley's thorough and erudite work *The Shape of Ancient Thought* fills, at least as far as ancient philosophy is concerned. Previously, if a reader of Radhakrishnan was thoroughly familiar with the Western intellectual tradition, he was bound to recognize similarities in the two traditions, but even in that case, because the technical languages of the two traditions differ, it might have escaped even the "expert" reader's attention how the Western and Eastern corpus of thought converged.

Thomas McEvilley's substantial volume, *The Shape of Ancient Thought*, is a remarkable and thorough confirmation of Radhakrishnan's claim. McEvilley starts off by recognizing the naive modern Western belief that asserts that philosophy began with the Greeks, a view that has unfortunately contributed to a supremacist, racist Eurocentric intellectual perspective. It was often asserted, especially after the Enlightenment, that the Greeks were rational and forerunners of modern science and technology, while the Easterners were irrational mystics, superstitious and primitive. Such notions helped to justify Imperialism, letting the colonialist powers exploit the colonies, all the while asserting that they bring civilization to the heathen savages.

The realization that Sanskrit is an ancient and sophisticated Indo-European language, preceding in time the rise of Pre-Socratic Greek philosophy, gave a brief jolt to the view that civilization belongs to the white-skinned Europeans. McEvilley points out that nowadays both Indian and Western scholars have come to believe that perhaps there was an ideological agenda behind the claim that Sanskrit was introduced into India by an Aryan invasion of light-skinned nomads who conquered and shoved the indigenous Dravidians southward. This may well not be a historical fact, but rather an ideological attempt to preserve