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CAN THERE BE NECESSARY CONNECTIONS BETWEEN SUCCESSIVE EVENTS?

NICHOLAS MAXWELL

The aim of this paper is to show that it is possible, as far as can be known for certain, that there exist logically necessary connections between successive events. It is argued that two events, E_1 and E_2 , may be said to be necessarily connected if and only if at least a part of what exists at the time of occurrence of E_1 is such that any propositions, P_1 , which completely describe this part, logically imply propositions, P_2 , which state that E_2 occurs subsequently. The conceivability of a true, comprehensive, realistic, deterministic physical theory ensures the conceivability of logically necessary connections, in the above sense.

SCIENTIFIC REVOLUTION FOR EVER?

WILLIAM KNEALE

Sir Karl Popper holds that the repeated overthrow of scientific theories is essential to the rational and empirical character of science; Professors Bohm and Vigier that it is inevitable because of the infinite complexity of nature. We can never prove that we have a true comprehensive theory, but there seems to be no good reason why men should not formulate such a theory some day. No doubt there would then be great danger of scientific dogmatism, but with proper attention to the constitution of natural languages it would still be possible to preserve the rational and empirical character of science.

DEFINITION AND DISCOVERY II

FRED WILSON

Some claim disposition terms are introduced by reduction sentences; others claim they are explicitly defined. The objections to the former, the defence of the latter, are briefly rehearsed. But the main point is to examine certain aspects of the socio-psychological process of discovery. The examination yields both diagnostic and expository material. Diagnostic: Assume the confusion behind reduction sentences is the desire that the context of justification reflect that of discovery. The examination shows that something like reduction sentences have a place in the latter. This uncovers some sources of the reduction sentence idea. Expository: The processes of discovery are analyzed within the definitionalist framework. This confutes certain supposed counter-examples to the latter.

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EXPLANATION AND VALUE NEUTRALITY

JAMES J. LEACH

In this paper an attempt is made to defend the Braithwaite-Churchman-Rudner argument against scientific value neutrality from the recent Hempel-Nagel-Levi attack. Following a clarification of the value neutrality thesis, involving three different interpretations, we distinguish it from two related but independent issues: a behavioralist reduction of belief to action and an instrumentalist reduction of truth to utility. It is argued, finally, that a weaker linkage between belief and action suffices to provide the important connection between 'accepting a hypothesis' and 'acting upon a hypothesis relative to a specific objective', which suffices to dethrone the traditional value neutrality thesis in even its weakest form.

ROBOTS, CONSCIOUSNESS, AND PROGRAMMED BEHAVIOUR

KEITH GUNDERSON

In 'The Imitation Game' I argued against what I took to be the most influential bad argument for saying that machines (or robots) could feel, think, or do such-and-such. Here I argue against what I take to be the most influential bad argument for saying machines (or robots) could *not* feel, think, and so on. Roughly this latter argument is to the effect that "The robot didn't *really* feel, think, etc., *because* it only did what it was programmed to feel, think, etc." It will not, however, do to impugn a robot's behaviour by appealing to the fact that it was programmed, since behavior is quite compatible with being programmed since it can be construed in terms of well-defined tasks. And insofar as a robot's non-behavior—its sentience—is concerned, appeal to programming is irrelevant. For whether a robot is sentient or not depends on the robot's nature—its input potential, basic capacities, etc. If a robot does not possess certain input potentials to begin with, then of course it will not be conscious. But the reason it will lack consciousness has nothing to do with whether it is programmed in a certain way. Any adequate psychology of robots must take account of both input potentials and programmes.

I then argue against the view that a subject could not be both sentient and a robot, and also suggest that the question of whether a robot could be conscious should be distinguished from the question of how we should treat borderline cases of robots and persons ("robsons" or "per-sots").

CORROBORATION, EXPLANATION, EVOLVING PROBABILITY,
SIMPLICITY AND A SHARPENED RAZOR

I. J. GOOD

By assuming some natural axioms, explicata are deduced for (degrees of) corroboration, explanatory power, and complexity in terms of 'weight of evidence' and amount of information, these in their turn being defined in terms of logical, subjective, and 'evolving' probabilities. (An evolving probability is one that changes in the light of reasoning without new empirical evidence. It is useful for resolving a paradox in the theory of simplicity.) A distinction is made between weak explanatory power which is unaffected by cluttering up a hypothesis with irrelevancies, and strong explanatory power which is so affected. The maximization of the latter is suggested as a sharpened form of Ockham's razor and as a unifying principle both in the interpretation and design of statistical experiments.

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HIDDEN VARIABLES AND THE COPENHAGEN INTERPRETATION—A
RECONCILIATION

JEFFREY BUB

The central thesis of this article is that the hidden variable hypothesis is not necessarily incompatible with the essence of the Copenhagen interpretation of the quantum theory. A hidden variable theory can be developed which explicitly incorporates Bohr's concept of 'wholeness' as a new ontological thesis. This is the idea that macroscopic measuring instruments and microscopic measured systems belong to different levels of functioning which are not related mechanically. Such a theory has certain testable consequences that contradict the predictions of the quantum theory. Some standard arguments against the hidden variable hypothesis are examined from the point of view of this theory.

SOME ASPECTS OF CARNAP'S THEORY OF INDUCTIVE INFERENCE

CARL-ERIK SÄRNDAL

The first part of this paper (Sections 1–6) is based on Carnap's logic of inductive inference of the direct and indirect types. In describing the individuals, different sets of predicates are considered. One set of predicates consists of 'classificatory properties,' another set consists of 'order properties'.

By application of Carnap's results, degrees of conformation are given for direct and indirect inference when the sentences of evidence and of hypothesis have the form of statistical distributions stating the population or sample frequency for each property contained in a set of pairwise exclusive and exhaustive properties of the classificatory or order kind. Logical connections will exist between certain sentences stated in terms of order properties, and, as a result, certain relations will be found to exist between degrees of confirmation pertinent to inference for classificatory properties on the one hand and to inference for order properties on the other.

The aspects of inductive logic treated in the early sections are used in the latter part of the paper (Sections 7-9) and placed into the perspective of some problem areas in statistical inference theory. By suitable identification, the various formulae for degree of confirmation $c(h, e)$ are taken as probability distributions attached to certain random variables.

The division of inductive logic into direct inference and indirect inference corresponds to the dichotomy of statistical inference theory into 'frequency theory' on the one hand and 'Bayesian theory' on the other.

THE CASE AGAINST TELEOLOGICAL REDUCTIONISM

LARRY WRIGHT

After some preliminary logical comment on the nature of the positions to be criticized, three examples of the reductionist position are produced and critically examined. Although these positions differ in many respects, they are found to have a common, and from one point of view surprising, commitment to causal determinism. This paper argues that this commitment is both essential to the epistemologically strong (and hence attractive) version of reductionism, and simultaneously fatal to that thesis.

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VAGUENESS, INEXACTNESS, AND IMPRECISION

R. G. SWINBURNE

There is often uncertainty about whether some predicate applies to some physical object or state. This uncertainty may have any of three sources—vagueness of a term, inexactness of a concept, or practical difficulty in determining its applicability. Various ways in which conceptual inexactness or practical difficulty may produce uncertainty are distinguished. Neither terminological vagueness, nor practical difficulty in determining the applicability of a concept are necessary features of every language in every physical world, but conceptual inexactness is a necessary feature of empirical concepts. These results are utilized to determine the sources and necessity of imprecision in measurement.

THE STRUCTURE OF ACCEPTANCE AND ITS EVIDENTIAL BASIS

P. M. WILLIAMS

A classificatory concept of acceptance is discussed as a pragmatist relation between sentences and language-users. Structural conditions on acceptance are analysed for their compatibility with a probabilistic rule of acceptance, tentatively adopted for this purpose. Two simple axiom systems for strong and weak concepts are distinguished, which are later shown to be essentially equivalent in terms of positive acceptance, positive rejection, and suspension of judgment. The concept of evidence is analysed in the light of the proposed structure of acceptance and, as a result, evidential sentences are found to be capable of having a limited theoretical content.

ACTION, CAUSALITY, AND TELEOLOGY

RUTH MACKLIN

It is argued that not only are purposive explanations compatible with causal explanations of human actions, but also that the former—when suitably recast—can plausibly be construed as a species of the latter. A non-Humean, nonmechanistic sense of 'cause' is suggested which is

applicable both to explanations in natural science and to human action. In particular, it is shown that: (1) the fact that actions are essentially purposive or goal-directed does not entail that explanations of action need be teleological in form; and (2) the employment of teleological categories does not preclude the employment of causal categories in explanation of action. The view propounded does not amount to a reduction of teleological to nonteleological language; rather, it places teleological terms in a context in which they can be used in causal explanations of actions.

THE 'PRESENT' IN PHYSICS

H. A. C. DOBBS

This paper seeks to controvert the view that the transitory 'now' of physical events is a wholly mind-dependent feature contributed by the observer. It suggests, by reference to the physics of predictors, that on the contrary there are genuinely objective features which afford a valid basis for a non-mental distinction between past, present, and future. Specific reference is made to Norbert Wiener's work entitled *Extrapolation, Interpolation and Smoothing of Stationary Time Series*; where the transitory aspect of the 'now-point' $t = 0$ determines the physical applicability of certain mathematical expressions; and the possibility of their realisation in terms of engineering hardware.