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### "THEORY AND OBSERVATION (I)"

#### Marshall Spector

It is widely believed that it is possible to distinguish in science in a general way between two classes of terms and entities: those which are *observable* and those which are *theoretical*. Furthermore, it has been maintained that the latter cannot be 'directly understood', as can the former, but must be understood in the context of the entire theory in which they occur. In the present paper, I undertake an analysis of the concept of an observation term and the concept of a theoretical term, and show that these two assumptions are incorrect.

### "A LOGIC FOR EVIDENTIAL SUPPORT (I)"

#### L. Jonathan Cohen

Conditions are postulated to which a confirmation-function denoting degree of support by eliminative induction should conform. In particular the support given by a particular evidential statement to a universal hypothesis is normally to vary directly with the support so given to a substitution-instance of that hypothesis. Various consequences are shown to follow from these conditions, including a law which excludes such a functor from being an interpretation of any well-formed expression within the classical calculus of probabilities. It is also argued that these conditions and their consequences are implicit in at least one familiar concept of evidential support and can be illustrated from its actual operation in science.

### "COULD A MACHINE PERCEIVE?"

#### Alan Gauld

Prominent in contemporary psychology are "machine theorists," who believe that full explanations of human behaviour may ultimately be achieved by drawing analogies between the workings of the brain and those of modern electronic machines. The tendency of machine theory is to force its protagonists to analyze possession of a concept into a disposition to follow a set of rules relating changes in the state of a machine-organism to changes in the "inputs" which it receives. There are certain high-level (but commonplace) concepts whose possession cannot be analyzed in this way. Machine theorists must therefore either (a) produce a completely new analysis of what it is to possess a concept, or else (b) admit that they can give no account even of "object perception," a very ordinary human activity to which possession of the complex concepts in question is often essential.

## Volume 17, No. 2

### "THEORY AND OBSERVATION (II)"

#### Marshall Spector

This is the second part of a two-part article continued from the previous number.

## "A LOGIC FOR EVIDENTIAL SUPPORT (II)"[1]

### L. Jonathan Cohen

A generalisation of one of C. I. Lewis's modal logics is developed, and it is shown that certain expressions definable in this system have a logical syntax that enables them to be interpreted as confirmation-factors for the type of eliminative induction discussed in Part I. Many logical properties of these functors are thus proved from postulates enjoying an intuitive plausibility that is distinct from intuitions about induction. Comparisons are made in appropriate cases with Carnap's theorems for regular c-functions.

## "THE USE OF STATISTICS IN EXPLANATION"

### Arthur W. Collins

*Statistical Explanation* has come to be thought a pattern of explanatory argument that approximates but diverges from the deductive model for explanation by admitting as premises near universal generalizations rather than laws and by utilizing inductive rather than deductive inference. Such a conception, this paper argues, is (i) totally unable to account for the realities of explanatory practice where statistical information is relevant, (ii) based on erroneous extrapolation from the deductive model, and (iii) fundamentally self-defeating since ideas essential to this viewpoint would suffice to rule out any statistical explanation whatever.

Formally identical statistical propositions can be interpreted either as pure statistics or as *statistical causal assessments*. The relevance of a statistical proposition (p% of F are G) to the explanation of an event (G) depends on its interpretation relative to this distinction and is independent of the magnitude of p.

# Volume 17, No. 3

## "THE *RAISON D'ETRE* OF INDUCTIVE ARGUMENT"

### Max Black

Induction is conceived as a public practice, embodying distinctive rule-governed activities, each instantiated in indefinitely many inductive performances. Assuming, as seems reasonable, that the practice aims at rational acquisition of truth, it seems plausible to expect links between the 'immediate purpose' of the individual inductive performance and the more general purpose of the instantiated activity—and between the latter and the overall purpose of the supporting practice. Such links are, in a way, easily found. It is an *a priori* truth that inductive arguments of given forms are *more likely than not* to lead from true premises to true conclusions based upon those premises. Thus, the performances are weakly conducive to the general purpose of arriving at the truth. It is tempting to hope for a stronger connection than this—to establish that certain cognitive benefits *must* ensue from the use of inductive methods. Glimpses of such connections are indeed to be captured: We can see, for instance, that the 'proportional syllogism' is *bound* to yield true answers from true premises in most of the cases of its application. And even in the more problematic instance of 'simple education', the paper shows that a case can be made for an associated guarantee or 'security' against an excessive number of predictive failures. But the outcome of such argument is meagre, which suggests, in turn, that a basic fallacy of method may be involved in seeking to detach particular inductive methods from the global practice to which they belong. It is argued that the practice, *considered as a whole,* can be shown, by sound and non-circular inductive argument, to deserve rational approbation.

[1] This is the second part of a two-part article continued from the previous number.

## "A NEW LOOK AT THE PROBLEM OF INNATE IDEAS"

### Nicholas Rescher

The paper addresses itself to the question: What good reasons (if any) can be found for holding a theory of innate ideas? However, before dealing with this question, the paper deals with the obviously preliminary query: Exactly what are the concepts and the theses that are involved here—just what is at issue in a theory of 'innate ideas'?

After a brief survey of the history of discussion of innate ideas, the matter is considered from a novel perspective. The problem of innate ideas is reformulated in terms of innate human propensities to arrive at and make use of certain 'ideas' or mechanisms in handling 'ideas'. These propensities are sought for in the first analysis in those empirical uniformities in human thought processes, or rather in the conceptual schemes inherent in natural languages. Such regularities are germane if they prove in the final analysis to be not merely accidental or haphazard uniformities, but *functional* uniformities—i.e., features of the 'logic' of the human 'thinking machine' that reflect the attainment of demonstrably efficient and effective modes of functioning in the context of the conceptual problems. This mode of analysis is explained and illustrated with reference to the fundamentally analogical structure of human problem-solving processes.

## "THE ACHILLES PARADOX AND TRANSFINITE NUMBERS"

### C. David Gruender

Some common approaches to solve or dissolve the paradox are examined, and an analysis is proposed whereby the plausibility of accepting the task of covering a distance by taking an infinite number of discrete steps is explained, although this is neither a necessary nor a sufficient condition for traversing a continuum. Since questions of the application of the mathematical concepts to actual continuities of space and time then arise, some suggestions for their physical interpretation are offered.

# Volume 17, No. 4

## "SOME RELATIONS BETWEEN PHILOSOPHICAL AND SCIENTIFIC THEORIES"

### S. Körner

Philosophy may be useful to science by (a) exhibiting the internal limitations of science, enforced by its logico-mathematical framework and by its need for conceptual simplification (b) by exhibiting regulative principles, implicit in the construction of specific kinds of scientific theory. It may be harmful by fallacious attempts to prove the impossibility of abandoning certain concepts. Science may be useful to philosophy in fields in which they both compete for answers. (Thus metamathematics has provided answers to philosophical questions.) It may be harmful by encouraging claims that concepts not used in a certain scientific enquiry, e.g. behaviourist psychology, are therefore empty. In conclusion two specific problems are discussed in some detail, namely the problems of the analysis of so-called correspondence rules and of so-called theory-laden concepts.

## "REFUTATION OR COMPARISON?"

### G. C. Archibald

A problem exists because probabilistic hypotheses in economics, which do not satisfy Popper's refutability criterion, cannot be made to, because the multitude of individually insignificant and independent influences on human conduct lead, by the Central Limit Theorem, to

normally distributed errors: improved specification or measurement cannot solve this problem. Popper's treatment of probabilistic hypotheses is unsatisfactory: a decision about a confidence limit does not produce refutability in the sense of a logical relation (contradiction) between a universal hypothesis and a basic statement. A new Demarcation Rule is proposed: a statement is scientific if its truth or falsity can be compared, whether decisively or tentatively (probabilistically) with that of another statement. This is Popperian in spirit, but better accommodates statistical methods in general and social science in particular.

### "PARESIS AND THE ALLEGED ASYMMETRY BETWEEN EXPLANATION AND PREDICTION"

#### PAUL DIETL

Professor Michael Scriven has argued that syphilis, considered the "only cause" of paresis, provides a counter-example to the thesis that explanations always provide information which could have been the basis of a prediction because the chances of syphilitics becoming paretic are small. Professors Grünbaum and Hempel have misunderstood the force of the example. Grünbaum confused necessary and sufficient conditions; Hempel confused logically and factually necessary conditions. The correct solution is to draw a distinction between something's being mentioned as a cause and something's constituting an explanation. That the former can lack predictive import does not show that the latter can.

### "ON MODELS"

#### J. W. SWANSON

This paper examines the "classical" theory of models (Braithwaite *et al.*), finds it wanting, and proposes two key emendations. First, the standard claim of isomorphism of structure, based on a symmetrical interpretation of isomorphism, is found inadequate. Nelson Goodman's non-symmetrical notion is suggested as the proper one for model theory. Secondly, the heuristic role of models is reinterpreted in terms of Max Black's filter theory of metaphor, here sharpened in terms of the concept of a rational preference ranking. It is argued that this latter notion allows for a behavioristic reconstruction of the "filter" theory of metaphor.