Philosophy of Science in Japan: 1966-1970

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The following attempt is a general review of the philosophy of science in Japan during the latest five years. Regarding the preceding ten years 1956–1965, one can refer to Professor Seizo Ohe's report published in the other periodical (*Ann. Japan Ass. Phil. Sci.*, Vol. 3, No. 3, 1966). Since then an amount of contribution has been made toward our study of philosophy of science.

In connection with a fascinating book *Philosophy in the Scientific Age* (3 Vols., ed. by Natsuhiko Yoshida et al., Baifukan, Tokyo, 1964), another worthy one, collecting ambitious essays, was issued: *Basis of Science* (ed. by Shozo Ohmori *et al.*, U. of Tokyo P., 1969). In this book mathematicians and natural scientists as well as philosophers act their parts admirably, and they all have precious face-to-face discussions on topics such as exactness in mathematics, physical knowledge, and life and consciousness. Nobushige Sawada urges, in the preface to the book, that the common aim of the collaborators is to set a stage for mutual exchange of their own views.

Sawada is also the author of *The Structure of Knowledge: Conquest of Dogma and Scientific Thought* (NHK Publishing Co., Tokyo, 1969). In spite of its popularity, Sawada's book may be most interesting; he, in fact, severely criticizes the obscurity and sterility of our traditional philosophizing. Shozo Ohmori's article 'Perceptual Scenery and World Picture' in *Basis of Science* is esteemed as most conspicuous among his many phenomenalistic essays. From his viewpoint, which he often calls 'the theory of overlapping' of perceptual scenery and scientific world picture, he offers sharp criticism against the arguments brought forward by preoccupied philosophers.

Shigeo Nagai has issued, with his collaborator Hiroshi Kurosaki, a thoroughgoing book *Fundamentals of Philosophy of Science* (Yushodo, Tokyo, 1967), in which are explored many basic problems of the philosophy of science by means of the logical method, and is criticized, at the same time, the standpoint of materialistic philosophy. Nagai is chairman of the committee of *Philosophy of Science Society, Japan*, and has edited its annals *Philosophy of Science* (Vol. 1, 1968; Vol. 2, 1969; Vol. 3, 1970).

Hidekichi Nakamura's ambitious book *Basis of the Philosophy of Science* (Aoki Shoten, Tokyo, 1970) treats about the fundamental issues of analytic philosophy. But Nakamura argues that analytic philosophy has certainly some limits,

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which undoubtedly make materialistic philosophy indispensable for making up the shortcomings of that philosophy.

Logico-linguistic analysis must be sound within the scope of explanation of ready-made scientific theories. But science, in its real phase, should be rather regarded as research-science of unknown truth than as learning of existing knowledge. From such a viewpoint Hiroshi Nagai, the present writer, has prudently examined 'metascientific' problems hidden at the very basis of science in the making in his *The Philosophy of Science* (Sobunsha, Tokyo, 1966).

Science in general might not be self-sufficient on account of the fact that its fundamental concepts and principles, and the methods employed in using them are not always self-evident. For this reason the thoughtful scientist will, indeed, sometimes take pause from his research activity to reflect upon the kind of knowledge he has obtained about the universe he lives in. In this way Hideki Yukawa occasionally lays stress on the point that his own concept of elementary domain is originally based on a metaphysical idea embraced by the ancient Chinese philosopher Chuang Tsu. Yukawa's philosophy of physics is displayed, e.g., in his *Creative Man* (Chikuma Shobo, Tokyo, 1966).

On the other hand, Takahiko Yamanouchi's philosophy of physics is worthy of notice. In his interesting treatise *On Understanding of Modern Physics: The World a Physicist Looks at* (Chikuma Shobo, Tokyo, 1970), Yamanouchi gives the model theory its highest possibilities, and his discussion is really based upon the precious experience obtained through the many years' study of a veteran physicist. Moreover, his argument is so much brightened in the light of modern logic that we are likely to be persuaded to approve its plausibility.

Shoji Maehara, a mathematician, is distinguished among our philosophers of mathematics. Though he is rather an expert in the foundations of mathematics, he often ventures on discussing the philosophical problems latent in the basis of mathematics. Some of his thoughtful ideas will be found, e.g., in his article 'The Exactness of Mathematics' (*Basis of Science*). Furthermore, it must be remembered that a stimulating debate as to the idea of 'formalization' and 'axiomatization' in mathematics has recently provoked between Maehara and Setsuya Seki; the latter is also regarded as one of our leading mathematicians (S. Maehara, 'Philosophy of Mathematics,' *Jour. Japan Ass. Phil. Sci.*, Vol. 9, No. 2, 1969; S. Seki, 'Philosophy of Mathematics,' *op. cit.*, Vol. 9, No. 4, 1970). In this controversial debate Seki seems to interpret every mathematical theory as *façon de parler*, while Maehara may be very favorably inclined towards a sort of realism.

Chikio Hayashi is a skillful mathematician and has vigorously continued to work on statistics. In addition to the intrinsic merit set forth by him in statistical researches, Hayashi has also paid philosophical attentions toward the foundations or methodology of statistical mathematics. In his essay 'Basic Problems in Statistics' (*Basis of Science*), Hayashi argues that statistics should be defined as systematization of statistical methodology which will be suitable for data analysis. From

his point of view, no existing statistics could satisfy such a demand, because it is used to discuss a formal unification of the things which are quite trivial to the real statistics. Hayashi has recently completed a voluminous work with his collaborators Isao Higuchi and Tsutomu Komazawa, in which he has clearly summarized his basic ideas of the philosophy of statistics (Preface to *Information Processing and Statistical Mathematics*, Sangyo Tosho Syuppan, Tokyo, 1970).

Ryuichi Yasugi, an eminent biologist, is seriously interested in the philosophical problems of biology, and has exerted all his efforts for clarifying its basic concepts, especially those of the theory of evolution (*History and Methodology of the Theory of Evolution*, Iwanami Shoten, Tokyo, 1965). In his recent essay 'On the Logic of the Theory of Evolution' (*Jour. Japan Ass. Phil. Sci.*, Vol. 9, No. 2, 1969), Yasugi has appropriately advanced his opinion on the philosophy of evolution theory. Besides Yasugi we can find another biologist Mamoru Iijima who shows his interest in the philosophy of science. Iijima deserves mention, indeed, as the author of *Between Biology and Philosophy* (Misuzu Shobo, Tokyo, 1969), which has found a welcome from scientists and philosophers.

Our psychologists have seldom done research for the philosophy of science with a few notable exceptions; the cases of Taro Indow and Yoshiharu Akishige are certainly exceptional. Their elaborate papers are found in the recent issues of our journal and annals (*Jour. Japan Ass. Phil. Sci.* and *Ann. Japan Ass. Phil. Sci.*). Indow is used to stress the salient characteristic achieved by the positivistic method of observation and experiment, which have taken the place of mere meditation; he analyses various kinds of experimental data by using mathematical models. He admits, of course, the limitation of such an approach towards man on account of the impossibility of formulation of human activities. But, he takes it for granted, at the same time, that in our scientific age, to study human activities is after all essentially tantamount to understanding them in terms of formal models.

Akishige's subject matter is the constancy of perception. According to him, the real color, shape and quantity of an object are neither given in special impressions nor in an aggregate of them. Moreover, no memory or reproduction of the previous impressions is even required for that purpose. Thus he concludes that the constancy of perception really consists in the possibility of constructing an invariance of perception.

The above is a brief description of the general state of discussion on the philosophy of science in Japan during the past five years. For further particulars, I cannot but hope that my forthcoming article may be found useful for reference: 'Recent Trends in Japanese Research on the Philosophy of Science,' *Zeitschrift für allgemeine Wissenschaftstheorie*, Philosophisches Institut der Universität Düsseldorf, Dezember 1970.