

Misreading biological complementarity: Bohr and his interpreters

Tuesday, August 8, 2023 9:50 AM (25 minutes)

In his August 1932 lecture to the second meeting of the International Congress for Light Therapy, Bohr made in public the transfer of his concept of “complementarity,” originally applied in physics in his paper of 1927 to the wave-particle duality, to the domain of biology. This lecture, subsequently published in English (1932, 1933), Danish (1933) and German (1933), positioned “complementarity” as a way of reconciling the current “mechanism-vitalism” debate over the relations of the biological and physical sciences. In the audience was the young theoretical physicist, Max Delbrück (1906-1981), who in all of his autobiographical remarks, commented that his attendance at this lecture motivated his shift in careers from theoretical physics to biophysics, and animated his research program into phage genetics (Nobel Prize in Physiology and Medicine, 1969).

Bohr, however, remarked on more than one occasion that his arguments concerning biological complementarity had never been correctly understood, but he never offered a detailed explanation of the origins and application of this concept. Consequently scholars have been in disagreement about the sources and interpretation of Bohr’s meaning (Faye 1976, 1979; Favrholt 1976, 1979; Kaiser 1992; Folse 1985, 1990; McKaughan 2005, 2011; Roll-Hansen 2000, 2011; Sloan 2012). This paper will discuss the contrasting interpretations of Bohr’s arguments in the 1930s by fellow physicist Ernst Pascual Jordan (1902-1980), in contrast to those of Delbrück. It will be argued in conclusion that Bohr’s positions on the relation of biological and physical explanations supply viable options today for dealing with the issues of biological reductionism.

Presenter: SLOAN, Phillip R. (University of Notre Dame)

Session Classification: Session 5