# 2021 WOSC Philosophy Umpleby

# Removing Constraints on the Advance of Cybernetics

Version 10

**Purpose** – Just as there are software versions, there are also versions of the prevailing conceptions of science and philosophy. Versions can differ by country or region. The purpose of this paper is to explain how the effort to develop cybernetics in the US has led to changes in the conceptions of science and philosophy in the US.

**Design/methodology/approach** – The approach of the paper is to explain what ideas in science and philosophy have been obstacles to the development of cybernetics and how those ideas are changing.

**Findings** As science has developed there has been a change from studying inanimate objects to working with thinking participants, both individuals and organizations. In the past scientists sought to use the same methods in the social sciences as were used in the physical sciences. Those efforts worked well for a time, but an interest in the roll of the observer and the relationship between theory and practice led to an awareness of the limitations of that approach. In management and operations research mathematical methods have been supplemented with group discussion methods.

Regarding philosophy, recent comparisons of cybernetics theories in several countries led to awareness that Europeans are using a larger set of conceptual possibilities than are Americans. Americans choose not to study a large part of philosophy. The history of philosophy can be thought of as a conversation between the followers of Plato and the followers of Aristotle. Europeans are familiar with this debate, but Americans are not. Europeans study the history of philosophy for two years in high school. They enter universities with a conception of how the knowledge in each field has developed from its roots in philosophy. One group, called realists, believes that knowledge is pregiven and needs only to be discovered. The other group, called idealists, believes that knowledge is created through our interactions with the world. The vast majority of Americans are familiar only with the realist perspective, having never encountered an alternative. The part of philosophy that has been neglected in the US was less important during an industrial society but is becoming more important due to the growth of an information society.

Europeans, by studying the history of philosophy, study the growth of knowledge in all fields. Americans tend to limit their studies to their primary discipline. They do not think about the growth of knowledge in general. This deliberate narrowing of interest makes Americans inexperienced in thinking about how knowledge grows in other disciplines.

There are several ways of describing cooperation among disciplines. Interdisciplinary research refers to research combining two or more disciplines, for example physical chemistry, statistical biology, or socio-economics. Multidisciplinary research occurs when several disciplines work together on a project, for example, how meteorology, hydrology, oceanography, and geology interact to produce the earth’s weather. Transdisciplinary research refers to creating a more general theory encompassing the theories of several disciplines. Examples are systems science and cybernetics. Transdisciplinary research is important because it leads to knowledge that is helpful in facilitating communication among people in different fields.

Transdisciplinary research, which seeks to develop more general theories, has been neglected in the US because Americans have not emphasized the goal of unifying science by developing knowledge of how the disciplines fit together. In Europe scientific fields are thought to be rooted in philosophy. For example, Adam Smith, who founded economics, originally taught moral philosophy. Europeans enter universities with an understanding of how the various disciplines arose from philosophy. Among US scientists philosophy, beyond the philosophy of science is widely thought to be not practical or useful. Due to this belief there has been an overemphasis in the US on specialization. The consequence is that Americans have greater difficulty communicating with people in other disciplines than do scientists in Europe. The part of philosophy that Americans are missing is important when conducting transdisciplinary research.

**Originality/value** – The value of this research is that it shows how Americans can become more effective at communicating across disciplines. Studying the history of philosophy and transdisciplinary theories such as systems science and cybernetics will aid the growth of knowledge in many fields.

**Research/ Practical/ Social/ Environment implications -** Changing assumptions in science and philosophy that limit innovation, will enable collaboration and cooperation among research fields and will help in generating more general theories, which is a goal in the effort to unify science.

**Research limitations** - Ultimate outcomes are speculative. Removing barriers in our thinking creates the possibility for more creativity, but it is not possible to know what specific new ideas will emerge.

# Keywords:

Cybernetics, transdisciplinary research, innovation, questioning assumptions, philosophy of science.