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ECOSYSTEMS

COMMENTARY

The Context of Ecosystem Theory

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ABSTRACT

Arthur George Tansley's paper "The Temporal Genetic Series as a Means of Approach to Philosophy," published here for the first time, provides the philosophical context for the development of his ecosystem theory. His rejection of idealist reasoning, his concern with ethics, and his long standing interest in Freudian psychology as well as mechanistic reasoning comprised the intellectual underpinnings for his thinking on systems and ecosystem theory.

Key words: Arthur George Tansley; systems; history of ecology; ecosystem philosophy.

INTRODUCTION

The founder of ecosystem theory, Arthur George Tansley, (1871–1955) once stunned his botanizing friends by arguing that Sigmund Freud was the most important thinker since Jesus (Godwin 1977). It is indeed a remarkable assertion for a man who is best known for his contributions to the field of ecology. Yet he was also a keen contributor to research on sex and psychology with lectures, book reviews, and several published comments on the issue for both scholarly and lay audiences. The following, hitherto unpublished article by Tansley, written shortly before he coined the word "ecosystem," provides an insight into the key elements of his thinking about systems of nature, knowledge, and society.

BACKGROUND

Tansley, it is worth recalling, was educated in the 1890s at University College, London, in an environment strongly influenced by the Fabian socialists, who argued that science was worthless unless it was of some value to society. Though he was no radical, Tansley also strongly believed that science should serve a social end, and he often expressed sympathy with leftist views. As the Russian Revolution gathered steam, he was even accused of promoting "botanical Bolshevism" and in effect denied a professorship at Oxford on account of his political views (Bower 1918; Boney 1991). Devastated by this rejection from the conservative dons at Oxford, he turned to psychology, partly as personal therapy but also because of his desire to be of some help to a society ravaged by the depredations of World War I. The result was his book *New Psychology and Its Relation to Life* (Tansley 1920b).

This book became Tansley's first academic success outside the closed circle of ecologists and botanists and received flattering reviews in all the major newspapers and intellectual journals of the time. It soon became a bestseller appearing in no less than 11 editions, and helped to establish Tansley as a leading scholar in the field of psychology. He lectured on Freud's theory of sexuality before the British Society for the Study of Sex-Psychology and nurtured a new generation of British psychologists (Cameron and Forrester 1999, 2000).

Tansley's theory of psychology is largely a synthesis of Freud's own work with an exploration of how it relates to biology. The human mind, Tansley argued, follows the laws of biology, and these laws are best expressed in Freud's psychology. Tansley saw a need for a theory of how psychic energies interact within the mind in search of an uncon-

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scious equilibrium and then strive to attain equilibrium within society. In his ecological research, he then developed a method for the classification of vegetation based on comparisons and analogies with social psychology (Tansley 1920a). His work in psychology took Tansley to Vienna, where Freud psychoanalyzed him in the spring of 1922. He resigned from his position as lecturer in botany at Cambridge University and for some years worked nearly full time in the field of psychology. Although in the end he gave up psychology as a profession, Tansley maintained an interest in the subject throughout his life.

While pursuing his interest in psychology, he also found time to publish *Aims and Methods in the Study of Vegetation,* the book that finally, in 1927, earned Tansley the prestigious Sherrardian Professorship in botany at Magdalen College, Oxford. His appointment was no accident: Ecology was much in vogue among biologists at Oxford, who hoped it would provide a new and better way of ordering nature, society, and knowledge in world shattered by war (Anker 2001).

The Context of Tansley's Paper

At Oxford Tansley became involved with the Magdalen Philosophy Club, a major battleground in the ongoing war between the romantic idealists and the material realists (Patrick 1985). The leader of the Magdalen idealists was John Alexander Smith, who, in his lectures on the heritage of idealism, argued that truth about the real world could only be attained through studies in the history of thinking. His chief intellectual ally, Robert George Collingwood, argued that all scientific knowledge was based on the history of "the idea of nature," a phrase that evolved into the title of a widely used textbook that grew out of his lectures at Oxford in the early 1930s. For Collingwood, a thorough knowledge of the history of ideas was the precondition for understanding the nature of scientific truth, which would ultimately lead to a revelation of the ultimate truth that is guaranteed by God's omnipotence and goodness. *The Idea of Nature* concludes with a vigorous celebration of idealism and an equally harsh condemnation of realism and logical positivism as the product of "the fanaticism of converts" (Collingwood 1944). What most concerned Collingwood was the ethos of moral decay and the flight from Christian values into the ethically and politically suspect path of positivism and material realism. This was the danger he perceived as inherent to Tansley's work. He believed that Tansley's approach, could only lead to an unforgiving technological line of reasoning.

Smith's and Collingwood's teaching assistants were two young philosophers named John Frederick Wolfenden and Thomas Dewar Weldon. Wolfenden—"Jack" in Tansley's paper—published a very readable book with balanced pro and con arguments that offered a circumspect analysis of the ongoing realism versus idealism debate and provided Tansley with much ammunition for the Club's meetings (Wolfenden 1932). Weldon, for his part, soon became a well-known philosopher whose self-appointed mission was to rescue Kant's philosophy from idealism and show that his epistemology could serve sound empirical research (Weldon 1945).

The realists at Magdalen were equally well represented. Most notable among them was the clinical neurologist and neurophysiologist Charles S. Sherrington, who won the Nobel Prize in 1932 for his work on nervous systems. No dogmatist, he would refer to the romantics with sympathy and engage in debates with Weldon on the importance of Kant's *Critique* to neuroscience, but he clearly rejected the idealism of Smith and Collingwood. The zoology tutor John Zachary Young was more of a realist hardliner; at their meetings, he would argue that in his discovery of nerve fibers in the squid and octopus he relied on physical facts about a real and not a noumenal world. The research of Sherrington and Young surely revitalized Tansley's interest in psychology, and together they formed a clique that focused on the nerve systems of both humans and animals. Other realist-oriented participants included the economist Redvers Opie, who was working on an English translation of Joseph Schumpeter's theories of business cycles; the physics lecturer Patrick Johnson; and the natural science tutor Malcolm Henry MacKeith.

These idealist and realists were Tansley's main audience, and his article should be understood as an attempt to respond to the arguments of the vocal idealist group. The spring of 1932 was a particularly hectic period for the Magdalen Philosophy Club. Weldon started a lively debate with a position paper that in effect was a critique of the idealist reading of Kant. He argued that the *Critique* revolutionized philosophy by making use of empirical advances in experimental physics. A true reading of Kant's universal system of knowledge would show that it was a philosophy relying on and laying a firm epistemological basis for universal laws in physics. Weldon had touched upon Kant's ethics, and Tansley now began to ponder whether, with the help of Freud, one could give an account of the apparently unex-

plained psychological assumption about "good will" in Kant's moral reasoning. The idealists were not pleased; Smith replied with a defense of subjective idealism, and his follower Harry Burrows Acton (a philosopher at Magdalen) questioned the possibility of establishing a scientifically based ethics. During the next meetings, Johnson and MacKeith continued with what appears to have been a defense of Weldon (their papers have been lost), before John Horace Woodroffe (a lecturer in natural science) launched a full-scale attack on realism and a defense of subjectivism. Tansley's response came in his paper "The Temporal Genetic Series as a Means of Approach to Philosophy," published for the first time below.

The Aftermath of Tansley's Paper

The paper is Tansley's main contribution to the philosophy of science and the longest explanation to be found of his broad use of the word "system," it encompasses a broad spectrum of natural, epistemological, and moral issues. It is therefore surprising that the paper never appeared in print; indeed, a later version of it may have been rejected by *The British Journal of Medical Psychology*.

In 1934, about 2 years after his lecture at the Magdalen Philosophy Club, Tansley received a paper by the South African ecologist John Phillips (Phillips 1934–35). He knew Phillips from the 1930 Fifth International Botanical Congress at Cambridge, where he had presented his paper on "The Biotic Community" (Phillips 1931). This paper presents an idealist foundation for ecological research based on the philosophy and racist politics of the South African statesman and philosopher Jan Christian Smuts (Smuts 1926). Smuts, who coined the word "holism," was seen by Phillips and American ecologist Fredric Clements as an important thinker and a patron of ecology. Tansley did not agree, and he sent his "systems" paper to Phillips (who passed it on to Smuts and perhaps Clements) to make his case (Anker 2001).

Phillips read the paper as an attack against idealism and his biotic community approach to ecology and published a long paper in defense of an idealist approach to ecology that opposed the mechanistic approach espoused by Tansley (Phillips 1934–35). Tansley's response came in his famous "Use and the Abuse of Vegetational Concepts and Terms" (Tansley 1935), in which he lays out the whole ecosystem concept. His approach to ecology was a progressive mechanistic alternative to the idealist biotic community concept of his rival Phillips whom he attacked in the most vivid terms. At the heart of the dispute was Tansley's ground-breaking theoretical paper about systems of nature, mind, and morality with its mechanistic approach rooted in Freudian psychology. Today, some 70 years after its conception, this gracefully argued seminal paper still retains its pungency and its relevance to ecologists everywhere.

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