

Resolution of Respect

Ramón Margalef

1919–2004

Ramón Margalef, Professor Emeritus of Ecology at the University of Barcelona, Spain, passed away on 23 May 2004, four days after his 85th birthday. His wife, María Mir, whom he had met at the university and married in 1952, died suddenly on 30 May 2004, just one week after her husband. They had four children. Ramón Margalef was Spain's most important ecologist, and one of the world's prominent limnologists, marine biologists, and theoretical ecologists of the 20th century. He was a pioneer in his own right, and made outstanding contributions to these and other fields (e.g., biogeography, geology, animal behavior, human evolution, and human ecology), leaving us an enormous body of scientific literature consisting of about 400 articles and 20 books and monographs. Taken together, this formidable scientific production laid the foundations of a comprehensive, coherent ecological theory. His scientific ideas have had a significant influence on several generations of ecologists, both through teaching (in Spain and elsewhere) and scientific publication.

Margalef's limnological work dealt with both algal and animal populations, and included contributions to methodology, taxonomy, ecology, paleolimnology, and biogeography. His studies on the comparative ecology of the reservoirs and lakes of Spain are one of the most comprehensive investigations of its kind in the world. In the field of biological oceanography, his major achievements centered on the quantification of plankton diversity, the study of the small-scale spatial distribution of phytoplankton, the analysis of upwelling ecosystems, the unification of physical and biological oceanography, and the relations between succession, production, and structural organization in ecosystems. Margalef's contributions to theoretical ecology were highly influential and earned him international recognition. In his seminal publication,



La teoría de la información en ecología (1957), first published in Spanish in the Memoirs of the Real Academia de Ciencias y Artes de Barcelona and then translated into English (General Systems 3, 1958), he advocated the application of information theoretical methods to the study of species diversity in ecosystems. This work marked a turning point and significant breakthrough in the study of communities and ecosystems. Other major theoretical works focused on the significance of species diversity and connectivity as measures of ecosystem organization and complexity, and on ecological succession as an evolutionary framework of ecosystem development. His 1968 book, *Perspectives in Ecological Theory*, represented one important effort to endow ecology with a high-level conceptual framework based on a comprehensive system of first principles. Margalef's scientific contributions were based on a combination of careful observation of the natural world, detailed and extensive laboratory work, a desire to find general rules, and an ability to discover hidden regularities among apparently disparate observations.

Ramón Margalef was born in Barcelona on 16 May 1919. He had early interests in limnology and botany, but personal and social circumstances precluded him from immediately following those inclinations. The Spanish Civil War (which Margalef referred to as the "uncivil war") interrupted his education, and in 1938 he was drafted into the Republican (i.e., loyalist) army and sent to the Ebro River front. He was captured by Franco's fascist troops after the Ebro battle, but escaped while he was being taken to a concentration camp. After the end of the war in 1939, he had to serve

in Franco's army for an additional period, until 1943.

In the years following discharge from the army, he attended the Botanical Institute of Barcelona as a volunteer student, while making a living as a clerk in an insurance company. Margalef's earliest publications can be traced back to that precarious period. Between 1943 and 1946, without academic or institutional support, he published 19 natural history accounts, ecological studies, and contributions to the knowledge of the biology of an astoundingly broad range of aquatic organisms, including culicid larvae, chironomids, epibionts, diaptomid crustaceans, green and blue-green algae, and ostracods (to mention but a few). This tremendous early productivity, together with his breadth of biological interests, were to become two of the most distinctive hallmarks of Margalef's career. Thanks to a grant from the Spanish Research Council (CSIC) that allowed him to attend the University of Barcelona, he obtained a degree in natural sciences in 1949 and a doctoral degree at the University of Madrid in 1951, with a thesis on temperature and morphology of living beings, one of his most cherished career topics. By about that time (1950), Margalef began working at the Instituto de Investigaciones Pesqueras (IIP) in Barcelona, one of CSIC's several laboratories in different coastal regions in Spain. During those earlier years, Margalef spent most of his time in the Barcelona laboratory (currently Institut de Ciències del Mar) but also worked in Galicia, northwest Spain, where he was involved in research on the ecology of the Rías Baixas, a complex system of fjord-like estuaries on the Atlantic coast. In 1965 he was appointed Director of the IIP, a post he resigned in 1967 to become the first Chair in Ecology in Spain, at the University of Barcelona. He worked simultaneously at the IIP and the University of Barcelona until the late seventies. From his positions at these two institutions he led an outstanding series of studies on the hydrography, phytoplankton, and primary production dynamics of the Mediterranean and Atlantic coasts of Spain, the Caribbean, and the Northwest African upwelling region. These investigations made a considerable contribution to the consolidation of oceanography in Spain and to its international recognition.

At the University of Barcelona, he established the Department of Ecology. There he trained several generations of ecologists, limnologists, oceanographers, and zoologists. As noted by ornithologist Xavier Ferrer, from the University of Barcelona, "the Department of Ecology then became the *refugium peccatorum* of many zoologists, and quite a few theses on dipterans, rotiferans, briozoans,

molluscs, crustaceans, and other organisms originated there, even though they were more genuinely zoological than ecological in scope ... from the sixties to the mid-eighties, there were more interesting and modern zoological books in the Department of Ecology's library than in the Department of Zoology." Margalef was deeply interested in any concept related to nature, and always supported all initiatives aimed at advancing knowledge in any branch of natural history. In 1954, he was one of the founders of the Spanish Ornithological Society, just a small example of his broad biological interests and naturalistic open-mindedness.

Margalef took pride in considering himself a naturalist before being an ecologist, and in his last published interview he emphasized that "the main quality of a good naturalist lies in the ability to watch nature ... contemplation leads one to admiration and knowledge, and the knowledge generated by admiration is quite different from that obtained from assimilating the pages of a book." The central role he assigned to open-minded, unprejudiced observation of nature in ecological research had been vividly expressed much earlier, when in his book *Comunidades Naturales* (1962), he stated that "ecology demands from us to look and look again at nature with a child's eyes, and nothing is more opposed to a child than a pedant." To him, one distinctive symptom of pedantry was the excess of mathematical formulations ("any ecological formula that is longer than 10 cm is necessarily wrong"), and he considered that "a good way to conceal ignorance is to invent some beautiful names with a Greek sound." Humility and militant antipedantry were two distinctive characteristics of Margalef's personality, and he persistently fled from any sort of pompousness ("Any reference to 'new ecology' would be as uselessly pompous as the name 'new systematics' has been," he wrote with irony in the Foreword to *Perspectives in Ecological Theory*).

Historians of Spanish science have often resorted to the appealing legend of the "isolated Spanish genius," the lonely autodidact scholar who, arising in a society that traditionally not only does not value, but is overtly hostile towards science or knowledge in general, eventually succeeds in the scientific enterprise and gains international recognition after a long struggle against countless hardships. Margalef would fit this archetypal figure in some respects, including of course autodidacticism and the harsh circumstances of an early career amid the depressing intellectual desolation of the Spanish post-Civil War. But Margalef certainly was no isolated genius. Early in his career, he visited for brief periods European laboratories in Naples,



Pallanza, and Plymouth, and several United States universities and research centers. On different occasions, he also acknowledged the influence on his own work of scientists like A. Thieneman, A. Buzzati, L. L. Cavalli-Sforza, H. W. Harvey, M. Parke, G. Evelyn Hutchinson, Richard Lewontin, Monte Lloyd, and Thomas Park. The last, “an inspiring figure for any ecologist” in Margalef’s own words, was the promoter of possibly the most consequential of Margalef’s overseas trips. In 1966, he accepted Park’s invitation to visit the Department of Zoology of the University of Chicago and deliver a series of four lectures, aimed, with charming understatement, at “expressing the conviction that some aspects of the solid ecology of yesterday and of today allow us to build a theoretical superstructure that, perhaps, is not irrelevant after all.” The substance of these lectures was later published in his 1968 book, *Perspectives in Ecological Theory*. This book had an immediate and revolutionary impact on the ecologists of the day, out of proportion to its size (111 rather small pages). Many English-speaking academics and students of ecology were to meet Margalef’s provocative thinking for the first time in this book. By the early seventies, ecology students in Spain (I was one of them) and Latin America were privileged to use his massive treatise *Ecología* (1974) as a textbook. Later on (1983), he published *Limnología*, another important and widely used university textbook. Although this

facet of Margalef’s activity was less known outside Spain and Latin American countries, it is important to note that he was also a great popularizer of ecology and wrote several books aimed at general audiences. These include *Ecología* (1981), *L’Ecologia* (1985, published in Catalan), and *Planeta azul, planeta verde* (1992). He also was a contributor to encyclopaedias of natural history, particularly *Història natural dels Països Catalans* (in Catalan, 1984–1992) and *Biosfera* (1993–1998). His university textbooks and popular writings probably served more than anything else to spread Margalef’s ideas in Spain and to elevate him to the category of intellectual hero in the minds of my generation of Spanish ecologists and subsequent ones.

An endless list of awards, distinctions, honorary memberships in learned societies, and Honoris Causa doctorates from universities all over the world, clearly speaks of the magnitude and unusual duration of Margalef’s international recognition. Among other distinctions, he received the Prince Albert Medal of the Institute Océanographique de Paris (1972), the Huntsman Award for Excellence in Marine Research bestowed by the Bedford Institute of Oceanography (1980), the Santiago Ramón y Cajal Prize of the Spanish Ministry of Education and Science (1984), the Naumann-Thienemann Medal of the International Association of Theoretical and Applied Limnology (1985), International Ecology Institute Prize from the Ecological Institute (Germany, 1997), the American

Society for Limnology and Oceanography's Lifetime Achievement Award (2000), and the Spanish Council for Research (CSIC) Gold Medal Award (2003). He was elected to the U.S. National Academy of Sciences in 1985, and in 1987 became the first Spanish ecologist to be awarded Honorary Membership in the Ecological Society of America.

Margalef combined his astounding intellectual capacity with a high human quality. He was generous in sharing ideas, and had a fine sense of humor. As a teacher, he freely communicated his knowledge and admiration for nature to students, and was quite effective at encouraging and conveying enthusiasm to young students. My greatest personal debt to Margalef can be traced back to the fall of 1975, when, as an anonymous 22-year-old student struggling to make an early start in science, I mailed him a poorly written manuscript draft. Only 6 days after my request I got in the mail a kind letter encouraging me to publish that little piece of youthful work. A teacher can never tell where his influence stops, to borrow Henry B. Adams' apt words, and I suspect that similar positive feedback marked the professional life of many other Spanish ecologists, who, like myself, approached Margalef for advice early in their careers.

Margalef remained a vibrant person and professionally active practically until his death. After official retirement, he continued to attend regularly the Department of Ecology of the University of Barcelona, where he was appointed Professor Emeritus. He also continued to publish (his last scientific publication dates from 2001) and to give invited lectures in symposia and special events. He was also happy to accept invitations for delivering seminars at Spanish universities, both small and large, and with characteristic humility heartily appreciated those invitations because "these are a sign that people still remember me and appreciate my work despite my age." It was at one of these events, held at the University of Jaén in 1998, that I met him for the last time. At 79, he still astonished us all with a lucid one-hour talk made up of a nicely interwoven, definitely unbeatable combination of abstract concepts and empirical observations. After the talk he disappeared from the campus, which caused great concern among the organizers of the seminar cycle. But the "old" guest Professor had left us behind, to explore at his own leisurely pace the beautiful old quarters of a city dating back to Roman times and the Middle Ages. In retrospect, I like to interpret that solo foray

into the labyrinthine streets of a city where he was a stranger, as a metaphor of survival into old age of the childlike curiosity that initially sparked young Margalef's adventurous entry into ecological science and subsequently guided his whole career.

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Selected publications of Ramón Margalef
A full bibliography may be found in:
<<http://www.icm.csic.es/bio/personal/fpeters/margalef/pdfs/publications.pdf>>

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