Norman Myers

1934–2019

BIOGRAPHICAL *Memoirs*

A Biographical Memoir by
Peter H. Raven
and Stuart Pimm

NATIONAL ACADEMY OF SCIENCES

NORMAN **MYERS**

August 24, 1934–October 20, 2019

Elected to the NAS, 1994

By Peter H. Raven and Stuart Pimm

Norman Myers was a powerfully prescient thinker who developed important hypotheses about the global environment and our interactions with it long before these issues became common currency among scientists, environmentalists, and politicians. He served as a consultant on a great many studies, consistently producing thoughtful results and tirelessly bringing those results to the attention of the public. His numerous books collectively sold more than one million copies. Myers was the first to suggest, beginning in the late 1960s, that biological extinction was occurring at a much higher rate than the literature reflected and that a mass extinction of species was underway. He participated in the early stages of determining the relationship between accelerating forest loss and increasing carbon dioxide in the atmosphere (greenhouse effect). His most enduring and original contribution was his theory of "biodiversity hotspots," areas in which major human impact was threatening the survival of thousands of narrowly restricted species of organisms.

Myers took a baccalaureate in French and German from Oxford University in 1958. He then began working for the British Colonial Service, dispatched to the then colony of Kenya as a district officer in the Maasai region. By the time Kenya gained independence in 1963 and his job no longer existed, he had been teaching at a local school, where he continued until 1965. Having come to love the country, he adopted Kenyan citizenship and continued his observations and photography of wildlife. He earned a Ph.D. in 1973 from UC-Berkeley. He never held a full-time faculty position during his long career as a groundbreaking researcher and environmentalist.

Norman Myers was born August 24, 1934, on a farm near Clitheroe, then in Yorkshire (now in Lancashire), England, to John Myers, a farmer, and Gladys (*née* Haworth) in a

In Kenya, Norman Myers developed a special interest in leopards and cheetahs that he maintained for a number of years. Here he is holding two cheetah cubs, in about 1968.

very rural setting. His illiterate father, said to have had a rather dour character, was suspicious of academic types and of "bookishness" in general. In contrast, his mother, a primary school teacher, encouraged him in every way, clearly playing a major role in building his character and strength. His family reports that he was always eager to please her, telling her of his activities, and especially his successes, frequently. He attended local schools and then fulfilled his mandatory national service as a gunner in the Royal Artillery, before being discharged following an injury. He went on to earn a degree in French and German in Keble College, Oxford, and remained an avid reader and formidable linguist for his entire life.

In 1958, at the age of 24, Norman joined the British Colonial Service, which posted him to Kenya, at that time a British colony. There, he served as a district officer in the Maasai tribal region, where he came to love—and often photograph—the richness and beauty of the life, both human and natural, that surrounded him. In 1963, five years after his arrival, Kenya gained its independence, which meant the end of his career as a civil servant. By that time, however, Kenya had become home to him, so he remained in the new country, taking up Kenyan citizenship. He stayed on as a teacher at Delamere School in Nairobi (1961-1965), continuing to observe and photograph wildlife and spending as much time in the countryside as he possibly could.

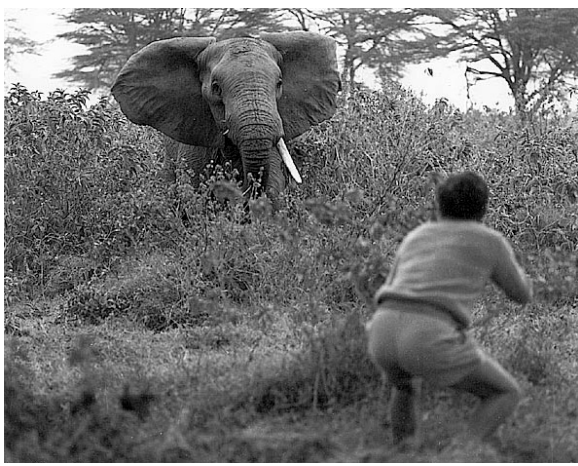
Norman regularly led groups of students to his favorite places, often to Mount Kilimanjaro or Mount Kenya, relishing the opportunity to share with them the natural landscape that he enjoyed so much himself. One commented, "He taught us to be individuals and yet to see the world around us and feel we had a part in it." Eventually, he met Dorothy Halliman, at the time a city planner working for the Nairobi City Council. She shared his interest in the environment; they married in 1965. Their two girls, Malindi (born 1970) and Mara (born 1973), both spent their early years in Nairobi.

By 1968, Norman had realized that biological extinction was proceeding at a much higher rate than the literature reflected. He sent out a form letter inquiring about this

phenomenon to dozens of other scientists, but received relatively few replies. One of them was from botanist and environmentalist Peter Raven, and it established a friendship and collegiality that lasted until the end of Norman's life, with a voluminous correspondence and occasional personal visits from that point onward. He and Raven constantly exchanged manuscripts and ideas, and looked for ways to support each other for more than three decades.

It is not surprising that Norman and Dorothy both became concerned about the fate of the environment while living in Kenya. The nation's population when Norman arrived in Nairobi in 1958 was 7.6 million; by the time he died 61 years later, it had grown to 52.6 million. It is projected to increase further to 91.6 million by mid-21st century and to keep growing rapidly and steadily after that. So many people cannot survive without overusing what their environment can produce sustainably; they will destroy that environment in the process.

After his marriage, Norman continued to observe life on the plains and in the mountains of Kenya, mostly as a professional photographer and student of wildlife. He and Dorothy built up a joint photographic business to the point where it could support them, thus making possible Norman's enrollment in 1970 in graduate school at the University of California, Berkeley. His doctoral dissertation was entitled "The relationship of parks and other protected areas to their environs in Masailand, East Africa," in many ways a good signal of his diverse future projects.



In his photographic work, just as in his numerous intellectual battles, Norman Myers exhibited great strength and tenacity in reaching his goals. Image from about 1968. (Photograph by Dorothy Myers).

In taking advantage of his opportunities at Berkeley, Norman clearly understood that only interdisciplinary study could properly get at the factors involved in causing environmental loss. More broadly, we need such studies to understand how to visualize and build sustainable interactions between people and the environment. In the wildlife management group at Berkeley, Norman

and his professors were always careful to incorporate all of the relevant fields, including ecology, resource economics, and international law, into their findings.

Broad syntheses of these kinds came naturally to Norman and provided a sound context for his best work over more than three decades. His first published paper, which appeared in 1971, concerned wildlife and development in Uganda. By the end of 1973, he had published eight more papers: he was well on the way to authoring, co-authoring, or editing 300 papers and 20 books, many of them useful and generally appreciated. His books collectively sold more than a million copies, a remarkable total for any scientist. The collection of his outstanding wildlife photographs, *The Long African Day*, first published in 1972, provided for many their first taste of the wonder and beauty that so fascinated him during the course of his years in Africa.

After earning his Ph.D. at Berkeley, in 1973, Norman returned to Kenya. He continued an ongoing interest he had in cheetahs and leopards and in seeking effective ways to conserve them. As the 1970s advanced, he enlarged his scope, combining what he had observed with what he had learned at Berkeley to analyze the many factors that were affecting the natural systems of Kenya.

At this time Norman lived with Dorothy and their two daughters in the suburbs of Nairobi. During those years, he and Raven remained in constant contact, mostly by fax, about matters of tropical deforestation, species loss, species number estimates, and related problems. Toward the end of the 1970s the U.S. National Science Foundation invited Raven to assemble a committee to produce recommendations for research priorities in the tropics. To provide a part of its context, the committee needed an up-to-date estimate of the rate at which tropical forests were disappearing. To conduct this study, Raven naturally thought of Norman, who by that time was carrying out occasional studies as a consultant. Raven and his NSF colleagues first considered that it would be a desktop study based primarily on the literature, but Norman soon persuaded them that it would be necessary to visit at least the key countries and to find out, on the ground, what was going on. Once we had agreed on those conditions, Norman readily accepted the task we had proposed to him.

In the days before satellite imagery made it possible to report the exact contours of a forest on a daily basis, Norman's idea of traveling to the countries involved, seeing some of their forests, and studying their local reports on the situation was especially significant. For more than a year, Norman traveled, assembled the reports, and analyzed them. He also engaged in voluminous correspondence on the subject of forest destruction, particu-

larly in 1978 and 1979, gathering valuable data and steadily enhancing his standing in the field. When the draft report was completed, a number of experts in tropical biology, who were able to augment its findings and assess their validity, weighed in with reviews.

What Norman found shocked everyone: most of the forests had been much more extensively damaged than official reports indicated, with additional destruction proceeding at a rate that up to then would have been unimaginable. The report's findings helped the committee comprehend fully the urgency of their task: If we were to learn much about the forests while they still existed, we would have to set clear priorities and pursue them before the forests were gone. This was all the more important since we had identified only a small proportion of tropical organisms, perhaps only about 5 percent, and we had no hope of finding most of the rest while the forests were disappearing so rapidly. Norman's work was a genuine wake-up call for the need to attend to the conservation of tropical forests as a matter of human wellbeing.

In the course of his studies on tropical forests and extinction, Norman was at the very front of the pack. As the results became more widely appreciated, they attracted a number of critics, some quite vicious in their methods; they claimed in general that he had overstated the cases either generally or for particular areas. In virtually every case, time has vindicated his findings and suggestions. Importantly, they stirred people to action. Well into the 1980s, though, people criticized both Norman's estimates of the extent of tropical deforestation and degradation, and his later correlations of these factors with the accumulation of carbon dioxide in the atmosphere. He was constantly embroiled in disputes about these matters, and the "noise" they caused certainly would not have helped him to gain support for further studies. Thus, Julian Simon, Hermann Kahn, Ariel Lugo, Frank Wadsworth, Eon Easterbrook, and Roger Sedjo, among others, attacked him continually, claiming that he was greatly overestimating the rate of destruction of tropical forest, the rate of extinction, and the reality of anthropogenic global warming.

Considering that we have cut down more than a third of all tropical forests since the days of their debates, generally accepted the fact that we have entered a Sixth Mass Extinction Event, and are certainly driving global warming at an unprecedented rate, we can only regret the early opposition to these views. At any rate, Norman certainly picked up his share of enemies during the course of his productive career; he may thereby have deprived himself of some of the honors and memberships that he would otherwise have gained. His life was so productive in important and original contributions to the cause of conservation that we can only say, it retrospect, that his views were well worth fighting for.

During these years of increased activity and global correspondence, Norman and his family began seriously to consider either returning to England or moving to a new base in the United States. After a couple of years of considering the options, they decided on England, mostly because they were more comfortable with the culture, the cost of living was less, and they wanted to give their own parents a chance to get to know Malindi and Mara, and them their grandparents. Thus in the summer of 1982, they settled in Headington, on the outskirts of Oxford, where Norman had been an undergraduate student two decades earlier. In moving, they left an increasingly restless Kenya and hoped that Norman would benefit from wider and stronger networks of colleagues in that familiar, and more accessible, setting. Before they departed, however, in early February 1982, Peter and Tamra Raven were able to visit them at their lovely home on the outskirts of Nairobi, and to meet Dorothy, Malindi, and Mara at the start of the Ravens' memorable trip around Kenya.

In England, Malindi, who was twelve years old at the time of the move, and Mara, who was nine, attended school and ultimately pursued their own careers from their new base in Oxford. By the time the family arrived in England, Norman's book on the global extinction problem, "The Sinking Ark," which appeared in 1979, had enhanced his reputation and led to wider recognition for him and his work. Soon, Norman joined Carl Sagan's team on Nuclear Winter, while keeping up his studies of extinction rates and geographical distribution. He also began to work with George Woodwell, Jerry Melillo, and others at the Marine Biological Laboratory, in Woods Hole, Massachusetts, on terrestrial carbon storage and contributing to some of the resulting publications. His very early interest in the meaning of carbon dioxide storage in tropical forests for global climates was a natural development from his assessment a few years earlier of the state of destruction of those forests.

Despite the quality of his work and the excellent plans he presented for future studies, Norman began worrying soon after the family's arrival in England about finding consistent support from foundations or other sources to enable him to pursue his studies and support his family. Although there was no lack of interest in his ideas, it soon proved more difficult for him to meet personal expenses than it had been in Kenya. The great majority of his activities and his sponsors were in the United States, and he was always grateful for publicity on this side of the Atlantic, sometimes feeling isolated while working from his Oxford home. As the decade moved on, he became increasingly concerned about these issues, often requesting help from both of us and from others in finding short-term teaching assignments, mostly at American colleges and universities, or

help with prizes or awards. He felt particularly neglected when his ideas became the basis of meetings and studies in which he was not invited to participate.

In 1988, Norman published his first paper on the concept of "hot spots" in *The Environmentalist*. In it, he identified ten areas comprising less than 3.5 percent of the remaining tropical forests, that he estimated were home to more than 34,000 endemic plant species—half of them likely to be lost over the coming decades along with a large number of endemic animal species. Thus, he showed that a major proportion of the Earth's biodiversity occurred in a limited number of specific areas that were often highly impacted by humans, a deduction of great importance for effective conservation actions. He based his conclusions on extensive correspondence with anyone who could offer useful contributions to his understanding of the global picture.

In his prescient recognition of biodiversity hotspots and their meaning for extinction overall, his insistence on the fundamental significance of human population growth in driving extinction and ecological instability, and his recognition of the importance of a finite biosphere on human well-being, Norman was far ahead of his time. Consequently, he was often met with resistance and sometimes temporarily relegated to the sidelines by colleagues who "knew better." Along with both of the authors of this memoir and a number of our colleagues, he was often engaged in arguments about the validity of his findings; virtually all of them, however, eventually proved correct. Norman was a true pathfinder in a world that seriously needs new and innovative insights in order for us to manage our common future properly.

At the time, the MacArthur Foundation was building its conservation program under the guidance of Board Member Murray Gell-Mann and staff member Dan Martin. They convened a discussion on the hotspots concept to help them develop their strategy in the autumn of 1988, months after the appearance of Norman's publication. The MacArthur Foundation and other organizations following their lead eventually allocated hundreds of millions of dollars to help conserve the rich biota found in the hotspots. Moreover, the hotspots concept provided the basis for the Critical Ecosystem Partnership Fund in 2001. This fund, initially sponsored by Conservation International, the World Bank, the Global Environment Facility, the MacArthur Foundation, and the Japanese government, has itself spent more than $250 million on hotspots, working together with civil society organizations.

Norman's *Environmentalist* hotspots paper had been recognized by Russ Mittermeier, of the World Wildlife Fund (WWF)—United States, as deeply insightful and potentially a

key to effective conservation activities. Mittermeier attempted to get hotspots adopted as a central strategy by WWF, but without success. When he moved to Conservation International the next year (1989) as President, CI adopted the hotspots idea as the central organizing principle for its conservation activities.

Over the next decade, Norman further developed the concept, making use of his extensive network and his tireless ability to analyze the literature. This effort culminated with the recognition of 25 hotspots in a landmark paper he published at the end of the decade with Mittermeier and others, and a more extended analysis as part of a beautifully illustrated book published at the same time. These authors enumerated 25 hotspots, the relatively undisturbed parts of which together constituted only 1.4 percent of the world's land surface, that were estimated to be home to some 44 percent of all species of vascular plants and 35 percent of terrestrial vertebrates. Over the years, the number of hotspots recognized has increased to 36, with their utility continuing unabated to the present.

Apart from his work with hotspots, Norman pursued a number of other important topics from the time of his arrival in Oxford in 1982 through the first decade of the 21st century, keeping relentlessly busy without neglecting his favourite hobby, long-distance running. He obtained a number of contracts for studies of particular environmental topics and the social factors connected with them. During those years, he served as a consultant to the World Bank, the European Commission, governments, foundations, and the Intergovernmental Panel on Climate Change (IPCC), producing dozens of reports that were not only useful to them, but most of which proved useful to wider audiences as well.

From the early 1990s onward, Jennifer Kent partnered with him on many projects, including the major hotspots paper. Together they worked effectively on many cross-cutting issues: environmental refugees; perverse subsidies; food and hunger in Sub-Saharan Africa; the rise of New Consumers and the "influence of affluence on the environment," where growing appetites for such items as energy, grain/meat consumption, and fossil-fuel driven cars has far-reaching impacts on an already overstretched planet; and institutional roadblocks to sustainable consumption. They coauthored six books in all over a dozen years. Jennie was a great help, highly supportive and with an encyclopedic knowledge of the literature and how to organize it.

These years, however, seemed to be times of particular stress as well. Although Norman had little patience for what would have been involved in a permanent academic

appointment, he related to a number of his colleagues that he regretted not having achieved a closer connection with Oxford or a long-term position somewhere else. He separated from his wife Dorothy in 1993, after 27 years of marriage, and they ultimately divorced (2012).

By the early 1990s, it was becoming harder for Norman to secure regular funding, and he considered taking a permanent position. He did not, however, succeed in finding something that he felt would offer him the freedom and support for research and publication of his forward-looking ideas. Thankfully, his writing future was then much enhanced and secured by several awards. In 1992 he received (jointly with Peter Raven) the Volvo Environment Prize for efforts to "promote international awareness of the crucial importance of biodiversity to the earth's environment." This was followed in 1994 by a Pew Fellowship, allowing him to "bring biodiversity problems and their possible solutions to the forefront of the environmental debate." Then in 1995 he received the UNEP (United Nations Environment Program) Sasakawa Environment Prize, again jointly with Peter Raven, for "their work over nearly three decades to investigate, document and analyze the scientific background to two major environmental problems: the decline of tropical forests and the worldwide loss of biodiversity." Finally, in 2001 Norman was awarded the Blue Planet Prize for "ongoing leadership in warning about new environmental problems."

Norman travelled widely, consulting, presenting seminars and leading discussions for some 25 years. He lectured repeatedly in Europe, North America and Asia, mainly to universities, but also zoos/aquariums, think tanks and major corporations. He particularly enjoyed his various visiting professorships at a number of universities, including Utrecht, Berkeley, Cornell, Vermont, Cape Town, and Duke. His annual sojourn to the University of Cape Town took him back to his beloved Africa and enabled him to combine two great loves—engaging with students and running. Each weekend he would take a group on a 6 a.m. hike up Table Mountain then return to lead a breakfast gathering to talk about conservation and where life might take those lively and enquiring minds. He also very much enjoyed his annual, month-long visiting fellowships at Duke University from 2002 to 2010, but, sadly, by the last two years there, it was evident that his health was starting to deteriorate. Throughout, he was a hugely popular, if unconventional lecturer. His visits were packed with lunches and dinners with students. They and the class lectures constituted one long discussion. As reflected by his writings, Norman could start a topic—say, asking what were the main threats to species, and then move quickly into the environmental harms caused by perverse economic subsidies. The readings required to keep up were prodigious, the students drained, but very energized when the month was over.

Norman had been athletic and sports-oriented for his whole life. In Kenya, he enjoyed running long distances with his Maasai friends and once completed a run to the top of Mt. Kilimanjaro and back in 13 hours and 40 minutes—ascending and descending about 13,000 feet and running 36 miles—a record at the time. In 1981, at the age of 46, he competed in the first London Marathon. After moving to England, he ran a number of marathons, including the Boston and New York runs, breaking the three-hour mark a number of times. At the age of 65, he competed in the 2000 London Marathon, after which his distance-running career was clearly winding down.

Crossing the finish line at the London Marathon in the year 2000. Competing in this event, he was 66 years old. (Official London Marathon Photograph).

When he was active, his running provided stress-free space during which he could organize his thoughts free from professional and personal worries. Evidently, Norman passed down the high expectations that his mother had of him. Malindi Myers, who worked in the U.K. Treasury, became a member of the British National rowing team, winning four world championship medals over a period of five years. She also has run marathons very successfully. Her younger sister Mara Yamauchi, who worked in the Foreign Office, became the second fastest British female marathon runner, and is still active. All in all, quite a family! Norman was deeply devoted to his daughters and unstintingly proud of their numerous accomplishments.

During the first decade of the new millennium he continued to function as a consultant and writer, but his health slowly deteriorated due to Lewy Body dementia and Parkinson's disease. Jennie Kent parted with him in 2008, a great loss for his effectiveness in pursuing studies. For the remaining decade of his life, he had less and less ability to communicate well with others, gradually abandoning travel and intellectual work. In view of his condition, his ultimate death on October 20, 2019, at the age of 85, was a blessing.

Norman Myers' life work has been suitably recognized in a number of ways. Perhaps his highest honor was his appointment, in 1998, as a Companion of the Order of

Norman Myers being congratulated by Prince Charles in 1998 on the occasion of his investiture as a Commander of St. Michael and St. George (CMG). (Buckingham Palace Official Photograph).

St. Michael and St. George (CMG); he was particularly proud of this honor—as he was of his 1994 election as a Foreign Associate of the U.S. National Academy of Sciences. Earlier, in 1983, he was awarded a Gold Medal by WWF International and, that same year, the Order of the Golden Ark, Netherlands. As mentioned above, Myers and Raven shared the Volvo Environment Prize in 1992, and in 1995, the U.N.'s Sasakawa Prize for the Environment. In 2001, Myers received the Blue Planet Prize in Japan. Among his other honors, he was named a Hero of the Planet by *Time Magazine* and listed on the UN Environment Program Global 500 Roll of Honour. All constituted fine recognition of his significant achievements.

These, and many other ways he was recognized, honored his originality and the intellectual impact that he had on many important areas at the interface of the global ecosystem and the development of human society. His mother would have been very proud of him: he was a unique individual who certainly made the most of the time allotted to him. We and his other colleagues will miss him greatly.

Peter Raven, President Emeritus at the Missouri Botanic Garden (peter.raven@mobot.org), and Stuart Pimm, Doris Duke Chair of Conservation at Duke University (stuartpimm@me.com).

Acknowledgments

We are indebted to Dan Martin, Jerry Melillo, Russ Mittermeier, Jennifer Kent and the members of the Myers' family: Dorothy Myers, Malindi Myers, and Mara Myers for contributing valuable suggestions, information, and personal memories to help us prepare this account of Norman Myers' remarkable life.

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