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<https://escholarship.org/uc/item/0qq0w2w9>

Journal

Molecular Biology and Evolution, 28(12)

ISSN

0737-4038

Authors

Hall, Barry G
Ayala, Francisco J
McClure, Marcella A

Publication Date

2011-12-01

DOI

10.1093/molbev/msr260

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Remembrances of Walter M. Fitch

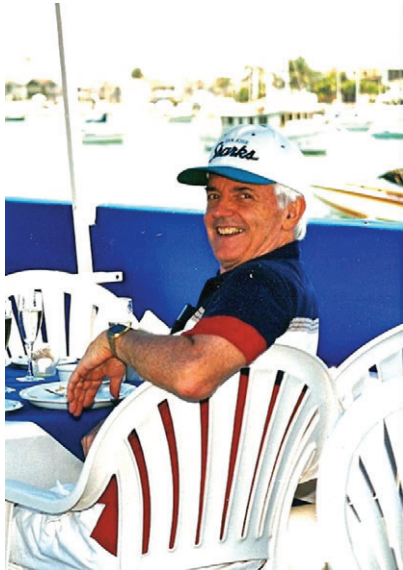
Barry G. Hall,¹ Francisco J. Ayala,² and Marcella A. McClure³

¹Bellingham Research Institute

²Department of Ecology and Evolutionary Biology, University of California, Irvine

³Department of Microbiology and Center for Computational Biology, Montana State University

Editor's note: To mark the passing of Walter M. Fitch, co-founder of *Molecular Biology and Evolution* and the Society for Molecular Biology and Evolution, his friends and colleagues have kindly agreed to share some personal remembrances. A formal obituary, written by co-founder Masatoshi Nei, will appear in a subsequent issue.



Photograph kindly provided by Mrs. Chung Cha Fitch.

Walter Fitch: Founder of a Journal, a Society, and a Field

Barry G. Hall

Walter Fitch, a Founding Father of the field of Molecular Evolution, the founding Editor-in-Chief of *Molecular Biology and Evolution*, and the first President of the Society for Molecular Biology and Evolution, died in his sleep on 10 March 2011. I will not comment on his extensive and seminal scientific accomplishments; there are others far more qualified than I to do so. Instead, I want to remind SMBE members, particularly those younger members who did not have the opportunity to know Walter, of his contributions to the Society and to the Journal.

In June 1982, during a symposium entitled “Evolution of Genes and Proteins,” Masatoshi Nei called together a group of molecular evolutionists to discuss creating a new journal with Walter Fitch as its editor. Most of us were enthusiastic about the idea, but we gladly left the actual organization up to Masatoshi and Walter. Within a year, they found

a publisher (University of Chicago Press) and started soliciting papers. The first issue of *MBE* appeared in December 1983.

From the beginning, Walter provided firm and energetic leadership of *MBE*. He appointed an extensive ‘Editorial Board’ that including most of the leading lights of the day, including a couple of Nobel laureates. The sole role of the Editorial Board was to decorate the cover of *MBE* to proclaim our legitimacy—but Walter also made it clear that he expected at least one paper from each Board member within the first 2 years. At meetings, Walter pestered virtually every scientist whose work he respected, virtually demanding that their next paper should come to *MBE*. As a result, by 1985, *MBE* was the third ranked among evolutionary journals, being surpassed only by the long-established journals *Genetics* and *Evolution*. By 1991, *MBE* had become the leading evolutionary journal.

Walter was as strong an editor as he was an enthusiastic recruiter of papers. Decisive is perhaps the best descriptor for Walter. His instructions to authors were replete with rules that were in no sense “guidelines.” Changes in nucleotide sequences were “substitutions” and in protein sequences were “replacements.” Taxa were to be listed in tables in the same order as in an accompanying phylogenetic tree. Sloppy grammar and punctuation were not tolerated. It was not at all unusual for a manuscript that had been accepted by an associate editor to be sent back by Walter accompanied by several pages of required corrections—a practice that many SMBE authors found quite frustrating.

In 1987, Walter asked me to serve as an associate editor, an appointment I accepted despite being absolutely terrified that I would embarrass both myself and the journal. At that time, there were, as best I recall, only about six associate editors. Based on the number of papers *MBE* published each year, an acceptance rate of about 50%, I had a pretty good idea of the work I was in for. To my great surprise, the editorial office sent me far fewer papers than I anticipated; most of the manuscripts I handled were submitted directly to me by the authors. Around 1989, I looked back over the existing issues to discover that between them, Walter and Masatoshi (the managing editor) were handling over 80% of the papers—an enormous burden on two active scientists. I drew this to Walter’s attention and urged him to assign more papers to associate editors. He confessed that he was, at times, overwhelmed by editing but he had simply never thought of assigning papers sent to him to others. That was completely consistent with Walter’s character—he simply handled everything that he considered to be his responsibility without complaint. After a few conversations, Walter did begin to use his associate editors more effectively.

In the spring of 1992, when *MBE* was publishing its eighth volume, Walter informed me that he would like to retire as editor after volume 10 and that he would like me to succeed him as editor. I was appalled. I carefully explained that I was not qualified, I was not even a real evolutionary biologist, I had insufficient breadth of knowledge, etc. Walter calmly pointed out that I would soon be visiting University of California, Irvine, to give a seminar and suggested that we could discuss the matter then at our leisure. I thought that Walter would forget the notion once he realized just how unqualified I was. I stayed in Walter's home for that visit and he indeed raised the issue again. Again I explained why I was unqualified. On the second evening, I was invited to accompany his family and friends as we went out to a sushi dinner to celebrate Walter's birthday. Walter was one of the few people I know who understood how to order sushi: Order everything that looks interesting and continue ordering until no one can lift another bite. If there are not any pieces left on the table, you probably need to place another order. Toward the end of the meal, Walter began explaining to the assembled guests, most of whom were not in the least interested in *MBE*, why I was perfectly qualified to be the next editor, then he again urged me to accept the post. At that point, sated on sushi and not a little sake, I would have agreed to undertake an ascent of Mount Everest. I agreed—in public, so to speak. Later, I began to appreciate just how cagey a fellow Walter actually was.

In June 1992, Masatoshi Nei organized a Molecular Evolution symposium at Penn State. Until that time the Society for Molecular Biology and Evolution had been strictly a paper entity, created solely so that the scientists could own the rights to the journal itself. Masatoshi proposed to the attendees that the Society should become active, have regular meetings, and serve as a focus for the continued development of the field of molecular evolution. He proposed a slate of officers to organize a functional society: Walter as President, Masatoshi as President-elect, Linda-Maxson as Secretary-Treasurer, Caro-Beth Stewart as Councilor, and Barry Hall as Editor-elect. When no other nominations came forward, the slate was elected by acclamation—demonstrating once again scientists' eagerness to support a good idea as long as others do the work.

As might have been expected, Walter was energetic and demanding as the five of us set about creating bylaws, deciding meeting policy, etc. Meetings were by email, and discussions were—to say the least—vigorous. It was decided that Walter would host the first annual SMBE meeting at University of California, Irvine, in June 1993.

In the spring of 1993, I was once again visiting Walter in his home during a several-day visit to learn the working of the *MBE* editorial office for which I would become responsible in September. Walter was one of the earlier people to apply computers to biology. Indeed, he was an accomplished computer jock long before the term “bioinformatics” was even imagined. It was therefore quite a surprise to discover that the *MBE* editorial office was run on the basis of 3×5 cards loosely filed in boxes. One evening, we got to discussing the

upcoming meeting. I argued the importance of short talk sessions as an opportunity for students, postdocs, and young faculty to get speaking experience and to present their wares. Walter was dead set against the notion, arguing that student talks in particular were typically badly done and presented trivial work. We subsequently argued our positions to Council in email exchanges. Walter lost, my position prevailed. The day following the Council vote on the matter Walter announced to Council that he would offer a \$500 prize out of his pocket to the best student speaker, and at the meeting, he appointed several of us as judges of student talks. Walter continued to fund the prize for the next 2 years, until at the 1995 SMBE meeting Council voted that SMBE would support the prize and name it for him. That was Walter's character. He thought that student talks were a bad idea, but he was absolutely sure that if we were going to have them we should encourage the best possible talks. Later, he changed his mind about the value of student talks, but I doubt that he ever completely realized how much his sponsorship of the prize influenced the exceptionally high quality of those talks to this day.

I took over the journal in September 1993 during the last three months of Walter's presidency. During 1994, Walter continued to serve on the SMBE Council as Past President. During that period, I changed a number of Walter's policies, changes that Walter was certainly made aware of. At no time did he criticize or attempt to interfere with those policy changes. When I asked his advice, as I often did, he gave it clearly and unstintingly. That, too, was completely consistent with his character. When he was responsible for something he would move heaven and earth to see that it was done according to his best judgment; when he was not responsible, he stepped away and left decisions to those who were responsible.

I had not seen much of Walter over the last decade. Nevertheless, news of his death came as a shock and I realize that I will miss him. Walter Fitch was not only an able scientist and administrator, he was a warm and generous man with a wonderful sense of humor, a dry wit, and a huge laugh. He shaped a field, a journal, and a society and much of what we take for granted today is the result of his insight, his energy, and his determination to do things right or not at all.

Walter Monroe Fitch: A Personal Remembrance

Francisco J. Ayala

In every friend we lose a part of ourselves, and the best part.
—Alexander Pope, 1732

I first met Walter Fitch in late June 1969. Theodosius Dobzhansky, the eminent evolutionist, and I were driving across the country from New York to California to the Mather Station of the Carnegie Institution near the entrance to Yosemite National Park, where we would do field research with *Drosophila* flies in the Sierra Nevada mountains. One stop along the way was in Madison, where we

wanted to visit with two or three scientists at the University of Wisconsin. One of them was Fitch.

Walter Fitch and Emanuel Margoliash had published in 1967 in *Science* (155, 279–284), “Construction of Phylogenetic Trees,” a paper that, as Dobzhansky had told me when all excited, he walked into my lab at Rockefeller University the morning he received the 20 January 1967 issue of *Science*, “would impact forever the way in which we reconstruct the phylogenies of living species.” Based on the amino acid sequence of a small protein, cytochrome *c*, Fitch and Margoliash had, astonishingly, constructed a phylogenetic tree of 20 species, from yeast, through insects, fish, reptiles, birds, and mammals, to humans, “remarkably like the classical phylogenetic tree that has been obtained from purely biological data” (p. 279). The possibilities were astounding: Organisms carry thousands of genes and proteins, every one recording the same evolutionary history. One and another and another gene or protein could be studied so as to achieve as much precision as wanted in the phylogeny. Fitch and Margoliash had relied for determining the phylogeny on the minimal “mutation distance,” an “analytical method [that] has general applicability” (p. 279), subject to quantification and statistical analysis.

Fitch and Margoliash had written, at Dobzhansky’s invitation, a long paper, “The Usefulness of Amino Acid and Nucleotide Sequences in Evolutionary Studies” (*Evolutionary Biology*, vol. 4, 67–109, 1970), still in press at the time of our visit, where they belabored their methods and a variety of useful concepts, such as “covarions” (concomitantly variable codons), neutral mutations, rate of fixation of nucleotide replacements, convergence versus divergence, and more. We wanted to meet Walter, this incisive evolutionist genius, as we saw him, then an assistant professor in the Department of Physiological Chemistry at the University of Wisconsin, Madison.

In 1975, I organized a symposium entitled “Molecular Study of Biological Evolution,” sponsored by the Society for the Study of Evolution and the American Society of Naturalists, held at the University of California, Davis, on June 17 and 18. The papers were published as chapters in a book, *Molecular Evolution* (Sunderland [MA]: Sinauer Associates, 1976) eventually reprinted in English and translated into foreign languages. The early chapters dealt with molecular variation in populations; Chapters 6–13 with variation between populations. Walter authored chapter 10, “Molecular Evolutionary Clocks” (p. 160–178), where with his distinctive analytical acumen, Fitch introduced in molecular evolution concepts such as “measurability,” “reliability,” “reciprocity,” and “regularity.” Walter stayed in Davis for several days, attending talks, while we also shared meals, talked a lot with each other, and developed what would become a lasting friendship.

Over the next decade, Walter and I frequently met at scientific meetings and other events in the United States and abroad. In 1986, Walter moved from the University of Wisconsin to the University of Southern California, in Los Angeles. In the fall of 1987, I moved from Davis to the relatively new campus of the University of California, in Irvine, some 40 miles from USC. Shortly thereafter, in 1988, Walter

invited me to give a seminar at USC and I used the occasion to begin the process of persuading Walter to move to UCI. Over the next several months, he repeatedly visited UCI, where he was appointed Professor in the Department of Ecology and Evolutionary Biology, starting on 1 September 1989, a position he held until his retirement in June 2009.

Other important events in Walter’s life happened in 1989. In April, he was elected to the US National Academy of Sciences. On 9 September, he was married to Chung Cha (Ziesel) in a private ceremony on the front patio of the fairly new Beckman Center of the National Academies at the edge of the UCI Campus. Hana, my wife, and I were the witnesses. We had known Chung Cha for more than a year. She already was, as she continues to be, our intimate and cherished friend.

At UCI, Walter taught and continued publishing important research accomplishments among which I will highlight only his investigations of the evolution of the human influenza virus. Using his analytical phylogenetic methods, Walter and collaborators were able to determine viral strains that would be the progenitors of the following year’s agents of flu epidemics, a feat of great theoretical significance and of considerable consequence for the development of the flu vaccines.

Walter and I published several joint papers on topics of molecular evolution, particularly the molecular clock. We also organized and, as editors, jointly published in the *Proceedings of the National Academy of Sciences* (and as separate books published by the National Academies Press), four colloquia sponsored by the National Academy of Sciences and held at the Academies’ Beckman Center. Ostensibly, these colloquia celebrated anniversaries of four of the major books that had formulated the Modern Theory of Evolution. We intended them also as activities that would enhance the visibility of evolutionary research within the National Academy of Sciences and elsewhere. The four colloquia were: In 1994, “Tempo and Mode in Evolution” (*Proc. Natl. Acad. Sci. USA* 91, 6717–6829, W. M. Fitch and F. J. Ayala, editors), commemorating the 50th anniversary of G. G. Simpson’s book with the same title; in 1996, “Genetics and the Origin of Species” (*Proc. Natl. Acad. Sci. USA* 94, 7691–7806, F. J. Ayala and W. M. Fitch, editors) on the 60th anniversary of Th. Dobzhansky’s classic book with the same title; in 2000, “Variation and Evolution in Plants and Microorganisms” (*Proc. Natl. Acad. Sci. USA* 97, 6941–7057, F. J. Ayala, W. M. Fitch, and Michael T. Clegg, editors) on the 50th anniversary of G. L. Stebbins’s, *Variation and Evolution in Plants*; and in 2004, just a few months before Ernst Mayr passed away on 3 February 2005 and 62 years after publication of his classic book with the same title, “Systematics and the Origin of Species” (*Proc. Natl. Acad. Sci. USA* 102 [Suppl 1], 6515–6635, Jody Hey, W. M. Fitch, and F. J. Ayala, editors.). (Seeking again to highlight the presence of evolutionary research within the US National Academy, John C. Avise and I started in December 2006 a new series of annual colloquia under the general title of “In the Light of Evolution.” The most recent one, “Cooperation,” fifth in the series, was held 6–8 January 2011, *Proc. Natl. Acad. Sci. USA* 108 [Suppl 2], 10787–10925, J. E. Strassmann, D. C. Queller, J. C. Avise and F. J. Ayala, editors.)

During his years at UCI, Walter received numerous honors and signs of recognition. Notably, he was elected to the American Academy of Arts and Sciences in 1991 and to the American Philosophical Society in 2000. In 2001, he was awarded Doctor Honoris Causa by North Carolina State University. In 2005, he received the greatest honor given by any campus of the University of California, the UCI Medal.

In the second half of the decade of the 2000s, Walter's health deteriorated owing to various ailments, leading to his retirement in 2009, although he continued to come to his office and to write. Early in the morning of 10 March 2011, I received an anguished call from Chung Cha: Walter had passed away at 6:30 that morning, peacefully in his sleep. The family held a memorial service at the UCI University Club on 8 April 2011. UCI's memorial service was held on 26 May 2011 at the Beckman Center of the National Academies in Irvine.

Walter and Me

Marcella A. McClure

Walter Fitch was a good friend to me. I will always remember the first day we met. But I knew Walter long before I met him. As a graduate student, I had to teach myself phylogenetic reconstruction. My questions and concerns were often addressed in yet another Fitch publication. I decided that I wanted to postdoc with Walter, but I was married and my husband hated cold weather.

I met Walter at the second Genes and Machines meeting. I was a postdoc, presenting the first work on the evolution of the reverse transcriptase. The meeting was a blur of famous scientists and eager younger people.

Sam Karlin introduced me to Walter at one of those small intimate dinners where the graduate students and postdocs meet the "big guys." Walter was with a beautiful Asian woman, the lovely Chung Cha. He was funny, kind, and welcoming. Walter encouraged me to talk about the work I was doing and about the patterns I was seeing.

A few months later, I decided to write to two scientists I met at Genes and Machines about finding work after my postdoc. I had just submitted my first NIH proposal for a second review and I was looking for a home. I wrote to Michael Waterman and Walter Fitch. Little did I know that Walter was moving to University of Southern California (USC).

On Thanksgiving Day, 1988, Walter called me. He said he just found my letter under a pile of papers on his desk. He was sorry the letter was two months old but was I still interested in working with him? I had already accepted Waterman's invitation to spend a few months in his lab at USC in the Spring and Summer of 1989.

Before going to USC, I invited Walter to give a seminar at San Diego State University. I was very nervous about hosting him. I had written a dozen questions on my arm so I would not forget them. After all I might not get the chance to pick this great brain again. As we spoke he noticed me glancing at my arm and he took my hand. His laughed so hard as he read my list that I started laughing, too. He said "My view is that if you cannot remember something this

time, it will come up next time, so just relax, we have years to talk." Tears brimmed in my eyes as he said, "You are going to work with me aren't you?"

That evening I drove Walter to the airport. It was raining. As we said goodbye, he straightened the collar of my raincoat and whispered, "I want you to be perfect when you give your first lecture at Harvard so remember data is a plural word." So I moved to USC under the watchful eye of Walter Fitch.

Walter and I met a couple of days each week to chat and share our eyes for each other's multiple sequence alignment corrections. He was fascinated with the motifs I was "seeing." These were Margret Dayhoff's "islands of conserved residues," as I learned from Walter's personal copies of the Atlas of Protein Structure.

Two Things Happened that Summer

Walter was awarded an NSF grant. One day he invited me to the Faculty Club for lunch. He asked me if I would be interested in a formal mentor relationship with him. He said he had funding for a senior person to move to UCI with him. He offered me \$40,000 a year, quickly stating that I was worth far more but that was all he had in the grant. I provisionally accepted, if I did not get my R01. He said if I did get it, I should just move with him anyway until I got a faculty position somewhere. I happily accepted. We were moving to UCI in the fall.

Then Walter was elected to the National Academy of Science. Life became a blur of champagne and smiles for him, and me, too, since he took me everywhere and introduced me to everyone.

I got my first R01 for 5 years. I had applied for dozens of jobs but who was hiring Computational Biologists or Bioinformaticians in those days? Walter agreed to share his space in the Department of Ecology and Evolutionary Biology (EEB) at UCI with me.

I knew I would arrive a week or so before Walter's move to Irvine. I found a great little house just a half block from the beach in north Newport. My car was filled with computers and printouts when I arrived at UCI. I remember the shock on the EEB office staff's face when I walked in and asked where to unload my computers. They had no idea who I was, as Walter had forgotten to tell the department I was coming. He even forgot to tell them I was transferring a brand new 5 year grant from UCSD to UCI. We all had a good laugh on Walter's inattention to such details.

Our lab space at UCI was the "penthouse" of the engineering building. Walter walked up and down way too many flights of stairs everyday and challenged me to do likewise. Within weeks of our arrival Walter's 40-some boxes of data from Madison arrived. I asked him what he wanted to do with all these pages of data. He wanted to keep them all but there was no storage space if either of us was to have any space to work. I decided to sort through the boxes for Walter.

I soon discovered that Walter had saved all iterations of every computational analysis he ever carried out. I kept all the ones with hand written notes and tossed the rest. But I discovered many other things in those boxes of data that

gave me greater insight into Walter. He smiled when I gave him a box of “things” I had found among the data—wine-flavored toothpaste, silk pajamas, a silk night cap, a set of phallic-shaped shot glasses and, well, a framed sign stating which sexual act was next to godliness. I really laughed when I found that. He explained that these were gifts that people had given him over the years. I thought to myself—how normal and very human my friend Walter is, how refreshing it is that he values humor and playfulness within the ever so serious world of science. A good example is the first joke he ever told me, “Why are women so bad at math?” and if you, dear reader, have not heard this one, call me please; it is the essence of Walter’s humor and flirtatiousness.

I am happy that I was able to spend a few days with Walter about a year before his death. He told me that the medications he was on made him hallucinate. I asked

him what he was seeing? He said “Oh, different people talking to me. Once Waterman, Atchley, and you were sitting in the closet yelling science at me.” Walter said we were arguing viciously in the nude! Such a vision really cracked me up. We all know Walter, the joker, so I think he embellished his story a bit to make me howl with laughter. He said he knew that these conversations were hallucinations but they made him feel less alone. I asked him when he thought he would die? He said a year or two. We held hands in silence.

Walter was a good friend to me and I miss him terribly. He was everything a real mentor should be: brilliant, funny, demanding, kind, forgetful, supportive, human, and forgiving. Finally, you fly the nest and if you are lucky you become lifelong friends. I was very lucky to have had Walter Fitch as a mentor, colleague, and lifelong friend. Thank you, Walter.