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The Origins of The Grass Foundation

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Introduction

In the fall of 1935, Albert M. Grass and Ellen H. Robinson both came to the Department of Physiology at Harvard Medical School (HMS). This entirely fortuitous confluence of their lives led to their marriage, to a commercial endeavor—the Grass Instrument Company—that would provide equipment of high quality to neuroscientists and other physiologists for over half a century, and finally to the formation of The Grass Foundation, which has benefited the neuroscience community since 1955.

The Department of Physiology at Harvard—the seedbed for these accomplishments—had a deep-rooted commitment to providing both financial and moral support to scientists who were at the beginning of their careers. Albert and Ellen clearly benefited from this commitment, for it generated interactions and collaborations that led to and facilitated the success of the Grass Instrument Company and then the Foundation.

Thus, the origins of The Grass Foundation must be sought, not only in the conjoined histories and proclivities of Albert M. and Ellen R. Grass, but also in scientific and educational developments that took place in the HMS Department of Physiology between 1906 and 1935, well before Albert and Ellen met there. This essay is an attempt to dissect those tangled threads; it ends with a discussion of The Grass Foundation's hallmark program—the Grass Fellowship Program at the Marine Biological Laboratory in Woods Hole, Massachusetts—and the impact that this program has had on neuroscience.

Albert M. Grass and Ellen H. Robinson

Albert Melvin Grass (1910–1992) was born in Quincy, Massachusetts, on September 3, 1910, to Henry J. Grass and Bertha (Martin) Grass. After graduating from Quincy High School, he funded his college education by working at Samson Electric Company testing and installing the amplifiers and systems that provided sound for films (Marshall, 1980; Henry, 1992). He was successful, both academically and financially, and the B.Sc. degree in electrical engineering was duly awarded by MIT in 1934. Albert remained at MIT to work on servo-mechanisms used to simulate earthquakes in the study of strains acting on model water towers and other structures (Marshall, 1980).

In May of 1935, Frederic A. Gibbs—a research fellow in neurology at the HMS Department of Physiology—contracted with Albert Grass to build a 3-channel electroencephalograph (EEG). Albert and his brother Everett worked in the basement of their father's house and finished the project early in the fall of 1935 (Marshall, 1980; Grass, 1984).

This accomplishment, completed in only three months, led to Albert's being hired as a part-time Research Instrument Engineer by the HMS Department of Physiology, and he remained in that position from 1935 until 1943. As part of this job, he continued to improve the EEG (Grass Instrument Co., 1971; Grass, 1984) and its applications (Grass and Gibbs, 1938). In addition, he worked closely with scientists, tailoring equipment to their needs (*e.g.,* square wave stimulators and amplifiers; Forbes and Grass, 1937; Marshall, 1980).

Ellen Harriet Robinson (1914–2001) was born in Taunton, Massachusetts, on March 29, 1914, the daughter of Laura (Waldron) Robinson and Francis James Robinson. She graduated from Taunton High School in 1931 and went to Radcliffe College, receiving her A.B. degree in Biology in 1935. She continued her education at Harvard University with Morgan "Kelly" Upton (1898–1984) and received a Masters degree from Radcliffe College in 1936; her thesis was entitled "Three Experiments in Audition."

On Upton's recommendation, Ellen decided to immerse herself in "a broader field of brain function" (Marshall,

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1995) and began graduate work in the Department of Physiology of HMS in the fall of 1935 (Marshall, 1980, 1995). A special arrangement was made with Radcliffe College so that she could take a course in "Research" (Marshall, 1995), and she was supported by a Porter Fellowship in Physiology (1935–1936) from the American Physiological Society (Howell and Greene, 1938; Fenn, 1963). Alfred C. Redfield (1890–1983) was her initial sponsor on a project entitled "Auditory Action Potentials" (Fenn, 1963; Brobeck *et al.*, 1987), but her work was ultimately conducted under the sponsorship of Hallowell Davis (Kemp *et al.*, 1937; Fenn, 1963). Ellen collaborated with a number of scientists, including Arthur James "Bill" Derbyshire (Grass, 1980), Edward H. Kemp, and Georges Coppée, a Fellow of the C.R.B. Educational Foundation, Institute de Physiologie, Liège. Her studies of the responses of the brainstem to auditory stimulation led to three publications (Kemp and Robinson, 1937; Kemp *et al.*, 1936, 1937).

Ellen Robinson and Albert Grass met in the fall of 1935 and were married on June 28, 1936. Ellen continued as a Ph.D. candidate in the Department of Biology at Harvard University, recording from the auditory cortex of rabbit in the laboratory of the noted physiological psychologist Karl Spencer Lashley (1890–1958). Soon, however, she decided to devote herself "to motherhood and doing whatever I could to help Albert provide equipment to a growing number of scientists" (Marshall, 1995).

The Development of Electroencephalography at the HMS Department of Physiology and the Formation of the Grass Instrument Company

The report of voltage changes recorded through the cranium of humans by Hans Berger (electroencephalogram, EEG; Berger, 1929) and his observations of EEG variations in patients with epilepsy (Berger, 1932; Gibbs *et al.*, 1936) were the basis for continued EEG studies of epilepsy in the United States.

At the time, Stanley Cobb (1887–1968) and William G. Lennox (1884–1960) were experts on epilepsy (*e.g.*, Cobb, 1922; Lennox and Cobb, 1928; Lennox, 1936; see White, 1984, for Cobb's complete bibliography) carrying out their investigations at Harvard Medical School (Hughes and Stone, 1990). In 1929, Cobb offered Frederic A. Gibbs (1903–1992), who had just received his M.D. from Johns Hopkins, a fellowship in neuropathology to work on epilepsy. Gibbs worked in the Lennox lab where he met Erna Leonhardt; the couple were married in 1930 and were collaborators thereafter (Hughes and Stone, 1990).

The Gibbses wanted to record EEGs from epileptic patients, and Hallowell Davis' engineer, E. Lovett Garceau (1906–1966), had built amplifiers and a portable EEG that could be used for such recordings (Garceau and Davis, 1934, 1935; Garceau and Forbes, 1934). Encouraged by Cobb, the Gibbses approached Davis to be a collaborator, and Davis enthusiastically endorsed their plan (White, 1984). With the departure of the engineer, Garceau, and the need for EEG machines with more than one channel, Frederic Gibbs sought out advice at the Massachusetts Institute of Technology. There he met Albert Grass (Marshall, 1980; Grass, 1984). With funding from the Macy Foundation, he contracted with Albert Grass in May of 1935 to "build three channels of EEG amplifiers to drive the Western Union Morse Code inkwriting undulator" (Grass, 1984; Hughes and Stone, 1990).

The Gibbses went off for the summer to attend the International Congress of Physiologists in Leningrad and Moscow, and to visit Berger and engineer J. F. Tönnies in Germany. In August of 1935, rather late in the summer, Frederic Gibbs mailed a sketch of Tönnies' neuropolygraph (designed for A. Kornmüller's animal studies) to Albert Grass (Grass, 1984; Hughes and Stone, 1990). By that time, the EEG machine being constructed by Albert and Everett Grass in Quincy must have been well along, for when the Gibbses returned in the fall, it was finished, as mentioned above. This EEG was used by Lennox, Frederic and Erna Gibbs, and Davis in their pioneering investigations, which demonstrated the power of the EEG in the diagnosis of epilepsy (Gibbs *et al.*, 1935, 1936, 1937; Brazier, 1968).

The demand for EEG machines increased markedly during the 1940s. To meet this demand, Albert began to manufacture commercial instruments (Marshall, 1987). Thus, the small business that started in a basement in 1935 continued as a partnership between Albert and Ellen Grass, and ultimately developed and grew to become, 10 years later, the Grass Instrument Company. The success of the Company was due to the balance between Albert's engineering skills and Ellen's scientific expertise, which was critical in the proper design of equipment to meet the needs of neurophysiologists (Fig. 1). Instruments were designed for "convenience, durability and serviceability" (Morison, 1979).

The Grass Instrument Company was never a typical business. In the early years, employees and many of the customers were warm and loyal friends of Albert and Ellen (Morison, 1979), and neurophysiological equipment was loaned to investigators throughout the world, and especially to Grass Fellows and courses at the Marine Biological Laboratory (MBL). To Albert and Ellen, the Company was always meant to contribute "to the development of human knowledge and the search for basic scientific truth." (Grass Instrument Co., 1967). They took great care to ensure that equipment was being properly used for the benefit of the patient. Ricardo Miledi recalls, "When I was in Mexico, I remember on more than one occasion, seeing a letter [from the Grasses] inquiring about doctors that intended to purchase their most advanced EEGs and other equipment. Albert and Ellen were very concerned that their equipment

Figure 1. Albert and Ellen Grass in 1955, the year that The Grass Foundation was formed. This picture was copied from a newspaper article entitled "Doctors Told of Findings by Quincy 'Brain' Machine" in the Quincy Patriot Ledger, Saturday, October 8, 1955.

be used wisely for the benefit of the patients and for research, and not merely to extract money from the patients."

Department of Physiology at Harvard Medical School

Albert and Ellen Grass's success was clearly due, in part, to the support they received from established researchers in the Department of Physiology at Harvard Medical School. Walter B. Cannon and Alexander Forbes were especially critical in this regard.

"Speaking personally now," Ellen once said, "Dr. Cannon made very many things possible for Albert and for me. He invested in us at a time when biomedical engineering was indeed in its infancy, and the role for women in science practically negligible" (Grass, 1970).

Walter B. Cannon (1871–1945) served as the George Higginson Professor of Physiology at Harvard Medical School for 36 years (1906–1942). For this entire period, he was chairman of the Department of Physiology and an Emeritus for his last three years. He made many important contributions to our understanding of how the human body functions: the use of Roentgen rays to investigate gastrointestinal motility (Cannon, 1898; Cannon, 1911; Brooks *et al.,* 1975; Barger, 1981), the effects of emotions on the functional state of the body (Cannon, 1915; Davenport, 1981), the basis of surgical shock (Cannon, 1923), the constancy of the internal environment or homeostasis (Cannon, 1939), autonomic neuro-effector systems (Cannon and Rosenblueth, 1937), and the effects of denervation on various tissues (Cannon and Rosenblueth, 1949).

Walter Cannon spent his undergraduate years at Harvard University and continued on at Harvard Medical School, where the faculty held that interested medical students should be encouraged to conduct original research. Thus, in the first semester of his medical training Cannon and fellow student Albert Moser were encouraged by Henry P. Bowditch (1840–1911) to conduct a study on deglutition (Benison *et al.,* 1987). Later, as a third-year medical student, Walter Cannon was approached by William Norton Bullard (1853–1931), a neurologist at Boston City Hospital, who offered to fund further research (Taylor, 1931).

These early research experiences clearly had a profound influence on the development of Cannon's scientific philosophies.

> Every man active in investigation has more problems in mind that he can work at himself. A part of his service to the world consists in training others by giving to others these problems to work at under his direction. These "others" are ordinarily his students,—young men who have been stimulated by his example. They are not yet established in life, they require remuneration until they have done enough work to warrant their being taken into independent positions. They should receive during these years of training (which are very likely to be productive of good results in research) sufficient compensation to afford comfortable support (Benison *et al.,* 1987).

Cannon is generally considered to have been exemplary in his scientific conduct and his concern for human welfare (Cannon, 1945; Forbes, 1945; Morison, 1945; Davis, 1975). He "saw that the freedom and beneficence of science could be guaranteed only within the framework of a just society, national and international" (Grass, 1970), and was committed to providing promising young scientists, independent of nationality, the opportunity to participate and contribute to the advancement of science (Morison, 1945).

One such scientist was **Arturo Rosenblueth (1900–1970)**[1] who came to Harvard from Mexico as a Guggenheim Fellow from 1930 to 1932 to work with Cannon. He quickly became Cannon's "favorite son" and secured a position in the Department of Physiology. Their collaborations continued for the next 14 years (e.g., Cannon and Rosenblueth, 1937, 1949).

Cannon and Rosenblueth mentored several scientists who would ultimately become founding and early trustees of The

[1] The names of the founding and early trustees of the Grass Foundation are printed in bold type in this section of the paper. E-mail: Steven.J.Zottoli@Williams.edu.

Table 1

Founding trustees and early trustees of The Grass Foundation

Founding trustees
Alexander Forbes
Albert M. Grass
Ellen R. Grass
Frederic A. Gibbs
William G. Lennox*
Robert S. Morison
Arturo Rosenblueth*
Richard R. Towle
Robert A. Zottoli
Early trustees
George H. Acheson, 1961
Donald B. Lindsley, 1958
Fiorindo A. Simeone, 1968

* Although Lennox and Rosenblueth are not listed as original members of the Corporation in the Constitution and Bylaws of The Grass Foundation, they are recognized as founding members in the minutes of The Grass Foundation.

Grass Foundation (Table 1). **Alexander Forbes (1882–1965)** as a fourth-year medical student was encouraged by Cannon to become involved in research. After receiving his M.D. degree in 1910 from Harvard Medical School, Forbes studied with C. S. Sherrington (1857–1952) for two years, and briefly with Lucas in 1912; afterwards, he returned to Harvard and the Department of Physiology (Fenn, 1969, Davis, 1970; Eccles, 1970). Forbes added a strong engineering background to the department and was continuously at the forefront of technological advances that he applied to neurophysiological investigations. These included the use of the vacuum tube amplifier in conjunction with a string galvanometer to record action currents in nerve and muscle (Forbes and Thacher, 1920, see also Gasser and Newcomer, 1921; Forbes *et al.,* 1931; Grass, 1984; Frank, 1986; Seyfarth, 1996), the study of reflex activity (Forbes, 1922; Davis, 1975; Seyfarth, 1996), and the use of microelectrodes for extracellular recording from cortical cells (Renshaw *et al.,* 1940; Brazier, 1968).

In fact, Forbes' technical and analytical strengths, along with those of Hallowell Davis (Forbes *et al.,* 1931), complemented the more integrative approaches of Cannon and Rosenblueth (Cannon, 1945). Cannon's encouragement of Forbes as a young medical student could not have affected a more appreciative and capable individual. Alexander Forbes quickly adopted the philosophy of encouraging scientists in his own way. He "anonymously supported others in the department of physiology" (Davis, 1970; Seyfarth, 1996).

One of the many young medical students supported by Forbes was Hallowell Davis (1896–1992). He received his B.A. degree in 1918 and the M.D. degree in 1922 from Harvard, worked for a year at Cambridge University in England with Edgar D. Adrian, and then returned to Harvard in 1923 as an Instructor in the Department of Physiology (Davis, 1991; Galambos, 1998). Some of his studies at Harvard include the all-or-none nature of the nerve impulse (Davis *et al.,* 1926), the use of the EEG in the study of epilepsy (Gibbs *et al.,* 1935), recordings from single units in the "auditory nerve" of cats (Galambos and Davis, 1943; the recordings turned out to be from cell bodies of the cochlear nucleus, Davis, 1975), and the tolerance of the human ear to loud sounds (Davis *et al.,* 1950). Hallowell Davis would become the sponsor of Ellen Grass' research and an exponent of EEG recording at Harvard.

Donald B. Lindsley (currently Trustee Emeritus) had come to Harvard Medical School with a National Research Council Fellowship to work with Forbes and Davis in 1933. During this period, Lindsley recorded motor unit responses (Lindsley, 1934, 1935a) and pioneered the use of the electromyogram in neuromuscular disorders (*e.g.,* Lindsley, 1935b, 1936; see Lindsley, 1995, for a review).

Arturo Rosenblueth had encouraged **George H. Acheson (1912–2000),** a first-year medical student, and **Fiorindo A. Simeone (1908–1990),** a third-year medical student, to consider conducting original research. Both contributed to the scientific productivity in the department (*e.g.,* Rosenblueth and Simeone, 1934, 1938a, b; Acheson, 1938; Acheson *et al.,* 1936, 1942; Simeone *et al.,* 1938) and went on to distinguished medical careers.

Robert Morison (1906–1986) received an undergraduate degree from Harvard in 1930 and the M.D. in 1935. He was encouraged to pursue research by his mentor, Rosenblueth, during his medical school years. "He [Morison] was a man of great and thoughtful learning but one who, above all, wanted to understand the meaning of life and the significance of science for that fundamental issue. He understood what it was to make a moral vocation of one's intellectual work, an effort that requires not only reading, writing, and thinking, but also something else: the living out, in daily life, of the values and virtues that animate that work." (Callahan, 1987). Morison collaborated with many of those present in the Department of Physiology in the 1930s (*e.g.,* Rosenblueth and Morison, 1934; Rosenblueth *et al.,* 1936) and went on to Rockefeller University and then Cornell (Eisner *et al.,* 1986–1987).

The Formation of The Grass Foundation

As the number of requests for financial support of neuroscience endeavors grew, Albert and Ellen recognized that a mechanism must be found to evaluate proposals and make decisions (Morison, 1979). The Grass Charity Trust was formed on December 31, 1948, and charitable disbursements were made after June 27, 1951. This Trust donated most of its assets to The Grass Foundation (The Grass Foundation minutes, 1958), which was formed in 1955 "to assist in advancing knowledge principally in the field of

Figure 2. Four of the original Trustees of The Grass Foundation. From left to right: Albert Grass, Frederic Gibbs, Ellen Grass, Robert Morison, and Erna Gibbs (not a Trustee) at the III International Congress of Electroencephalography and Clinical Neurophysiology held in Boston from August 17–21, 1953.

neurophysiology, and including allied fields of medicine and science" (Article 2 Section 1 of The Grass Foundation Constitution and Bylaws).

As we have seen, most of the founding and early trustees of the Foundation were, at some time in the 1930s, members of the Department of Physiology at Harvard Medical School (Fig. 2; Table 1). This is only fitting, because their commitment to the support of young scientists, their own exemplary performance at the bench, and their concern for human welfare (Morison, 1979) reflect the basic principles that have molded The Grass Foundation. The Foundation currently supports programs within the Society for Neuroscience, at the MBL, and at other institutions. The Grass Fellowship Program at the MBL was one of the first and most important projects of The Grass Foundation, and it continues to flourish.

The Association of Albert and Ellen Grass and The Grass Foundation With the Marine Biological Laboratory at Woods Hole

Albert and Ellen Grass's affinity for the MBL developed over many years and is based on several associations. For example, Alexander Forbes had a natural affection for the Woods Hole area. He spent summers on Naushon Island, which is still owned by the Forbes family, and he was a distinguished investigator at the MBL, publishing research done there with Catharine Thacher (Forbes and Thacher, 1925; Forbes, 1933). Albert Grass was undoubtedly attracted to the MBL because, as a center of neurophysiology, it was regularly visited in the summers by scientists who were actively involved in the development of new equipment. With this common interest, Albert developed lasting friendships with several MBL scientists, including Harry Grundfest (1904–1983) and Stephen Kuffler (1913–1980). Finally, Ellen was drawn to the MBL by her passion for the marine environment and the animals that live there. This passion was particularly evident in her Grass Instrument Company Calendars and the "live displays" presented at the annual meetings of the Society for Neuroscience.

Of the initiatives in support of basic science at the MBL, the Grass Fellowship Program most closely embodies the philosophy of the founding trustees who had "a love for the adventure of new ideas, a priority for assisting young investigators, and a program focus to direct its resources to the growth of neurophysiology" (Grass, 1987). Beginning with two fellows in 1951 under the auspices of the Grass Charity Trust, more than 400 young neuroscientists have spent summers at the MBL conducting independent research.

Established in 1959, the Forbes Lectureship is an integral part of the Grass Fellowship Program. Each summer, the Trustees of The Grass Foundation bring one of the world's outstanding neuroscientists to the MBL "to honor the outstanding achievements of Dr. Alexander Forbes as a pioneer and major contributor to the field of neurophysiology, who has always been an inspired teacher of young students." (The Grass Foundation minutes, December 11, 1958). The

Table 2

Grass Fellows from 1951 to 1961

Year	Fellow
1951	Hal C. Becker
	Samuel M. Peacock, Jr.
1952	Ellis C. Berkowitz
1953	Donald M. Maynard
	Y. Zotterman
1954	Daniel D. Hansen
	David D. Potter
1955	Ricardo Miledi
	Yutaka Oomura
	Joaquin Remolina
	William K. Stephenson
1956	Lionel Adelson
1957	Stanley M. Crain
	Clarence Hardiman
	Joan Taylor*
1958	Michael V. L. Bennett
	John P. Reuben
	William H. Rickles, Jr.
1959	Shirley H. Bryant
	Raymond J. Lipicky
	Charles F. Stevens
1960	Stephen T. Kitai
	Leslie B. Reynolds
1961	Bernice Grafstein
	Zach W. Hall
	Walter Herzog
	Robert H. Wurtz

* Her fellowship was carried out at UCLA.

Forbes Lecturer not only presents two lectures as part of the MBL's Lecture Series, but also shares space with the Fellows in the Grass Laboratory. Forbes inaugurated the series with a pair of lectures, on "The Growth of Neurophysiology" and on "Electrophysiology of Color Vision."

Many Grass Fellows have gone on to become leaders in neuroscience (Table 2), and many have come back to the MBL as investigators, course directors, instructors, Forbes Lecturers, and as directors and associate directors of the Grass Laboratory.

Ricardo Miledi is an example of a Grass Fellow who has had a major impact on neuroscience. He was born in Mexico City in 1927, received his B.Sc. from the Instituto Cientifico y Literario, Chihuahua, in 1945 and his M.D. from the Universidad Nacional Autonoma de Mexico in 1955. Miledi and Joaquin Remolina were working with Arturo Rosenblueth and Juan García Ramos at the Instituto Nacional de Cardiologia (García Ramos and Miledi, 1953, 1954; Rosenblueth *et al.*, 1954) when Albert Grass and Steve Kuffler came by to visit Rosenblueth. Informed about the Grass Fellowship Program by the visitors, Miledi and Remolina came to the MBL as fellows in 1955 (Fig. 3).

There was no Grass Laboratory or formal program at that time, and fellows generally worked in separate spaces and did not interact with one another a great deal. Steve Kuffler, Harry Grundfest (1904–1983), and their collaborators were perennial investigators at the MBL, and both were Forbes Lecturers, in 1975 and 1979, respectively. They acted as mentors for Miledi and other Grass Fellows in the early years of the program (Zottoli, 1990). Albert and Ellen Grass would also visit the MBL periodically to make sure that the Grass Fellows had what they needed in the way of equipment, space, and support.

While at the MBL, Miledi worked on lobster and crayfish stretch receptors and the squid giant axon (Miledi, 1957). Miledi has gone on to publish over 460 scientific articles, and he is one of two neuroscientists to be chosen more than once by the Trustees of The Grass Foundation as the Forbes Lecturer (the other is Theodore H. Bullock, in 1963 and 1991). Miledi presented some of his and Bernard Katz's seminal work on neuromuscular transmission at the MBL in 1964 as the sixth Forbes Lecturer. The topic of his two lectures was "Localization of ACh receptors and cholinesterase in muscle fibres." He returned as the Forbes Lecturer in 1990 (Fig. 3) and delivered two lectures on pioneering work that utilized frog oocytes to study native receptors and express exogenous messenger RNA (Kusano *et al.*, 1977, 1982; Barnard *et al.*, 1982). The subject of his two lectures was "How to study the brain using frog oocytes." Dr. Miledi has served two terms as a Trustee of The Grass Foundation (1992–1995; 1997–2000). He is currently a Distinguished Professor in the Department of Neurobiology and Behavior at the University of California, Irvine.

The philanthropic largess of Albert and Ellen goes well beyond the MBL and has benefited the neuroscience community in many other ways. For example, "individuals known to be sound investigators, working under budgetary or foreign exchange difficulties, often found themselves the recipients of indefinite loans" of neurophysiological equipment through the auspices of the Grass Instrument Company (Morison, 1979). Ricardo Miledi remembers, "Joaquin Remolina and I were once asked to make a list of Grass equipment to be bought for the Department of Physiology at the Institute of Cardiology in Mexico. We made a big list that was sent to the Grass Instrument Company and were looking forward, with great excitement, to the day when the equipment would arrive. Then, to our great consternation, there was a big devaluation of the peso and we were asked to send a new order with a good number of items deleted. Later, when the shipment arrived we were all extremely pleased to see that all the items in our original list had arrived and a few extra ones had been included, as if to compensate for our transient worries. I wonder if any other company exists that would do that?"

Albert Grass died in Quincy, Massachusetts, on May 29, 1992, and Ellen died 9 years later on June 14, 2001, also in Quincy. The Grass Foundation that embodies their ideals continues to be committed to providing general support for

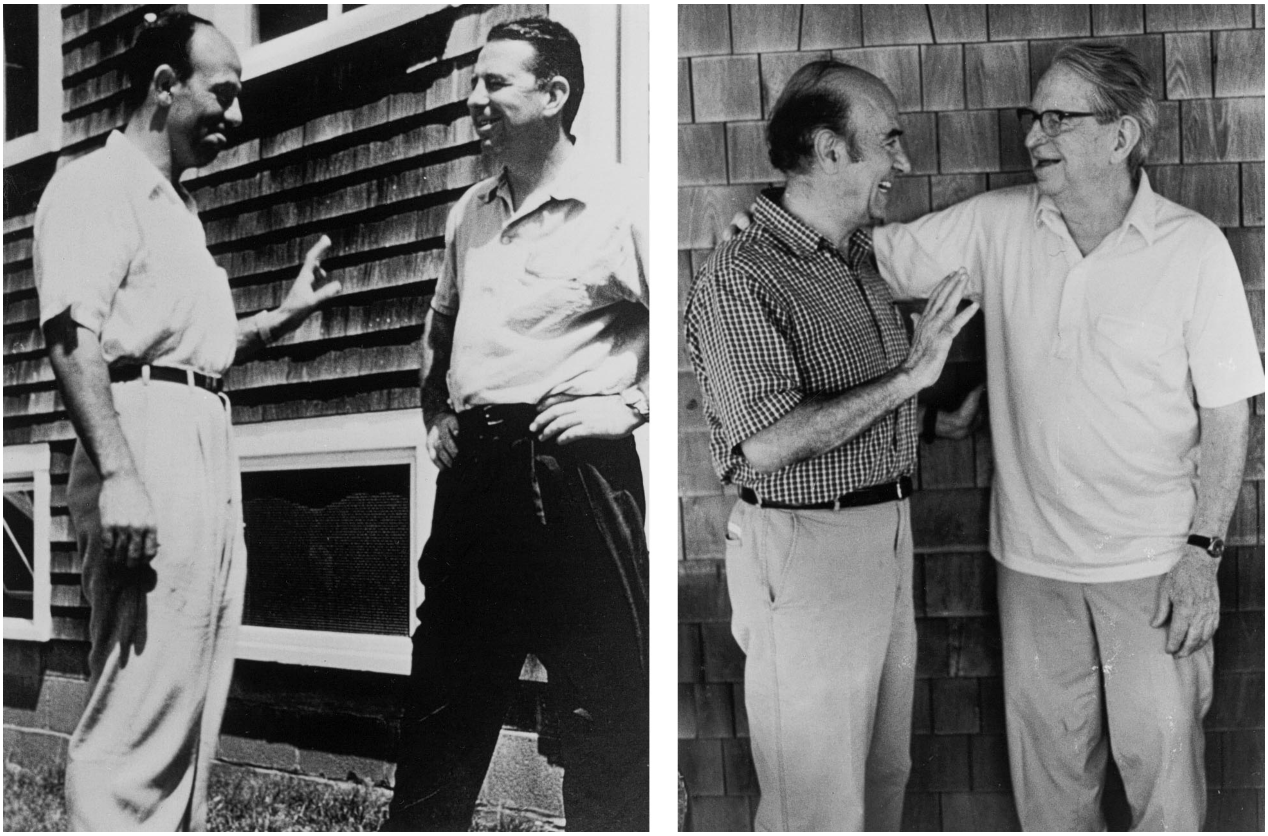

Figure 3. Albert Grass and Ricardo Miledi in Woods Hole, Massachusetts. The picture on the left was taken in 1955 at the Marine Biological Laboratory when Miledi was a Grass Fellow. The picture on the right was a reenactment of the 1955 photograph taken in 1990 at the National Academy of Sciences in Woods Hole when Miledi was a Forbes Lecturer for a second time in 1990. The 1990 photograph was taken by Steve Zottoli.

"excellent science." The tireless efforts of Albert and Ellen to monitor the pulse and flow of neuroscience have led to initiatives in support of the field, especially in helping those in need or just starting out. The greatest achievements of the Foundation's initiatives, such as the Grass Fellowship Program at the MBL, have resulted from the ability of the Trustees to *listen*, *hear* and *respond* to needs of scientists in a rapidly changing discipline.

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