The Program in Human Biology at Stanford University

The First 30 Years

1971–2001

HUMAN BIOLOGY CORE COURSES AND FACULTY COORDINATORS

1969/70
1 Man and Nature: Colin Pittendrigh

1970/71
1 Man and Nature: Colin Pittendrigh
2A Cells, Organisms, and Societies: Colin Pittendrigh
2B Behavior As Adaptation: David Hamburg, Alberta Siegel, Herant Katchadourian, Sandy Dornbusch
3A Man As an Organism: Norman Kretchmer
3B The Transformation of Human Society: Sandy Dornbusch, John Gurley, David Hamburg, Alberta Siegel, Herant Katchadourian
4A Biology of Populations: Paul Ehrlich
4B Topics in Sociobiology: Sandy Dornbusch, David Hamburg, Herant Katchadourian, Alberta Siegel

1971/72
1 Man and Nature: Colin Pittendrigh
2A Cells, Organisms, and Societies: Donald Kennedy
2B Behavior As Adaptation: David Hamburg, Alberta Siegel
3A Man As an Organism: Norman Kretchmer
3B The Transformation of Human Society: Keith Brodie, Sandy Dornbusch
4A Biology of Populations: Donald Kennedy
4B Economic and Political Aspects of Human Behavior: John Gurley

1972/73
1 Man and Nature: Colin Pittendrigh
2A Cells, Organisms, and Societies: Colin Pittendrigh
2B Evolution of Human Behavior: David Hamburg, Jane Goodall
3A Man As an Organism: Norman Kretchmer
3B. Contemporary Psychobiology: Robert Sears
4A Biology of Populations: Human Biology faculty
4B Contemporary Sociobiology: John Gurley, Sandy Dornbusch, John Adams

1973/74
1 Evolution of Life and Emergence of Man: Colin Pittendrigh
2A Cells, Organisms, and Societies: Donald Kennedy
2B Evolution of Human Behavior: David Hamburg, Jane Goodall
3A Man As an Organism: Norman Kretchmer
3B Development of Behavior: Alberta Siegel, Shirley Feldman
4A Biology of Populations: Luigi Cavalli-Sforza, Paul Ehrlich
4B Social Organization of Man: Sandy Dornbusch, John Gurley, Peter Corning

1974/75
1 Evolution of Life and Emergence of Man: Human Biology faculty
2A Cells, Organisms, and Societies: Donald Kennedy, Jack Barchas, Merton Bernfield
2B Evolution of Human Behavior: Jane Goodall
3A The Human Organism: Donald Kennedy, Jack Barchas, Merton Bernfield
3B The Person in the Social Structure: Alberta Siegel, Albert Hastorf, Sandy Dornbusch
4A Biology of Populations: Paul Ehrlich
4B Human Institutions: John Gurley, Peter Corning

1975/76
2A Biology of Humans: Donald Kennedy
2B Behavior of Humans: Donald Kennedy
3A Populations: Donald Kennedy
3B Social Systems: Sandy Dornbusch, Shirley Feldman
4A Human Life Cycle: Donald Kennedy
4B Human Institutions: Donald Kennedy

1976/77
2A Basic Concepts in Biology: Donald Kennedy
2B Basic Concepts in the Social Sciences: Albert Hastorf
3A The Biological

(Continues inside back cover)

Sciences: Donald Kennedy
3B The Social Sciences: Arthur Wolf, John Gurley
4A The Biological Sciences: Merton Bernfield
4B. The Social Sciences: Herant Katchadourian

1977/78
2A Basic Concepts in Biology: Merton Bernfield, Richard Goldsby
2B Basic Concepts in the Social Sciences: Arthur Wolf, Sandy Dornbusch
3A The Biological Sciences: Jeffrey Wine, Merton Bernfield
3B The Social Sciences: Albert Hastorf, Sandy Dornbusch, Shirley Feldman
4A The Biological Sciences: William Durham
4B The Social Sciences: Arthur Wolf

1978/79
2A & 2B Human Evolution: Culture and the Cell: Merton Bernfield (2A); Arthur Wolf (2B)
3A & 3B The Human Organism: Principles of Social-Psychological and Physiological Regulation and Integration: Merton Bernfield (3A); Sandy Dornbusch, Shirley Feldman (3B)
4A & 4B Populations and Societies: Ecosystems and Social Ecology: William Durham (4A); John Gurley (4B)

1979/80
2A & 2B Human Evolution: Culture and the Cell: Merton Bernfield (2A); Arthur Wolf (2B)
3A & 3B The Human Organism: Principles of Social-Psychological and Physiological Regulation and Integration: Merton Bernfield (3A); Sandy Dornbusch, Albert Hastorf (3B)
4A & 4B Populations and Societies: Ecosystems and Social Ecology:William Durham (4A); John Gurley (4B)

1980/81
2A & 2B Human Evolution: Genetics and Culture: William Durham (2A); James Fox (2B)
3A Properties of the Individual: Richard Thompson
3B Properties of Society: Sandy Dornbusch
4A The Human Organism: Richard Thompson
4B The Social Process: Shirley Feldman, Sandy Dornbusch, Albert Hastorf

1981/82
2A & 2B Human Evolution: Genetics and Culture: Margaret Race, William Durham (2A); Arthur Wolf (2B)
3A Properties of the Individual: Merton Bernfield
3B Properties of Society: Shirley Feldman
4A The Human Organism: Richard Thompson
4B The Social Process: Shirley Feldman, Sandy Dornbusch, Albert Hastorf

1982/83
2A & 2B Human Evolution: Genetics and Culture: Margaret Race (2A); William Durham (2B)
3A Properties of the Individual: Merton Bernfield
3B Properties of Society: Shirley Feldman
4A The Human Organism: Richard Thompson
4B Social Process of Decision Making: Sandy Dornbusch

1983/84
2A & 2B Human Evolution: Genetics and Culture: William Durham (2A); John Rick (2B)
3A Properties of the Individual: Merton Bernfield
3B Properties of Society: Shirley Feldman
4A The Human Organism: Richard Thompson
4B Social Process of Decision Making: Sandy Dornbusch

1984/85
2A & 2B Human Evolution: Genetics and Culture: Craig Heller (2A); Arthur Wolf (2B)
3A Properties of the Individual: Merton Bernfield
3B Properties of Society: Shirley Feldman
4A The Human Organism: Richard Thompson
4B Social Process of Decision Making: Sandy Dornbusch

THE PROGRAM IN HUMAN BIOLOGY AT STANFORD UNIVERSITY

HOW REMARKABLE THAT Stanford's Program in Human Biology graduated its first class thirty years ago! To commemorate this milestone, we have produced a brief history of the program. Here you can trace Human Biology from the earliest glimmer in the minds of the founders to the latest curricular ideas being used in the core courses. But we can only document what the faculty did to create and sustain Human Biology as one of the largest undergraduate majors at Stanford over these three decades. The real history of the program is written in the lives of our alumni. The success of Human Biology in educating students for an uncertain world is measured by our graduates. We admire and delight in the many ways they are changing the world, and we look forward to continuing to educate students to understand integrated, multidisciplinary approaches to the issues of the future.

—Russell Fernald, director
October 2001

The Beginning

THE STANFORD PROGRAM in Human Biology was founded in response to questions about education raised in the late 1960s, a turbulent time of social and political unrest. During that decade, three of the nation's leaders were assassinated, the Vietnam War divided America into conflicting factions, and the problems of poverty and racial inequality became focuses of intense concern and dissent. Environmental crises, such as pollution and deforestation, were perceived to threaten the health of humanity and the planet itself. Some students argued that their education should directly address these important issues.

Although science had produced modern medicine and other benefits to humanity, it had also produced the atom bomb and failed to alleviate many of the world's worst problems, in fact exacerbating some of them. Traditionally, scientists were not expected to worry about the uses to which their discoveries might be put. However, concern about the Vietnam War focused attention on questions about the use of technology and the role of scientists in society. Also, recent revolutionary discoveries in biology and medicine were raising as many ethical, social, and political issues as scientific ones. At the same time, many social scientists saw that the complex societal phenomena they studied often presented significant technological or biological aspects outside their disciplines. There was an unprecedented need for people in many fields to acquire expertise in biology, chemistry, and the other natural sciences.

Concerned educators at Stanford and elsewhere worried that traditional academic disciplines were not addressing these problems or adequately preparing students to confront the complex issues of the future. Society's problems were multifaceted and demanded interdisciplinary solutions, but university graduates often lacked a broad perspective. In the sciences, for example, narrow specialization was common: a chemist or biologist had little understanding of how a psychologist or anthropologist would approach a problem, and vice versa. The problem was described by the Ford Foundation's Gordon Harrison, who would help establish the Human Biology Program:

> It is a rare sociologist today who has had even one course in biology; it is still rarer for an economist or political scientist. Study of the behavior of people has traditionally been fragmented.

1968 Students and faculty initiate teach-ins to examine and challenge the traditional academic curriculum; biology students hold the Stanford Population and Environment Forum.

1968 Joshua Lederberg and David Hamburg teach innovative undergraduate special course "Man As Organism."

1968 Paul Ehrlich's *Population Bomb* is published.

1969 Stanford submits a proposal to the Ford Foundation to fund the new Human Biology Program; the Ford Foundation awards a $1,936,000 grant to Stanford for a five-year program trial period.

1969 The Stanford academic senate approves Human Biology as an undergraduate interdepartmental program.

> Many biologists, meanwhile, have acted as though evolution stopped at the lower primates. (*Stanford Observer*, November 1969)

Some visionary thinkers realized that interdisciplinary educational programs were needed to prepare students to face the challenges of the modern world. At Stanford, some eminent faculty members, among them Paul Ehrlich, Joshua Lederberg, and David Hamburg, perceived the need for an integrated approach to undergraduate education in the biological sciences. They wanted to create a curriculum that would coordinate the study of biology with related social sciences.

David Hamburg, chief of psychiatry at Stanford's medical school, and Joshua Lederberg, head of genetics, thought that advancing knowledge in their fields required contributions from many different disciplines. Taking advantage of the medical school's recent relocation (in 1959) from San Francisco to Stanford's main campus, they sought to establish connections and foster intellectual exchange with faculty from departments throughout the university. In 1968, Lederberg initiated and taught with Hamburg an innovative special course for undergraduates called "Man

DAVID HAMBURG

When he first launched Human Biology, David Hamburg had already established and headed the medical school's department of psychiatry and behavioral sciences. He did pioneering research on stress and anxiety, as well as the relationship between physiological and behavioral factors in mental illness. He was very interested in studying behavior of primates, in the 1970s helping Dr. Jane Goodall set up a center at Stanford to study primates called Gombe West. After Hum Bio was started, he taught in and continued to guide the program, at its first Reed-Hodgson Professor, until he left Stanford in 1976. He also served as as a key negotiator in the 1975 Gombe kidnapping, spending ten weeks negotiating in Africa for the students' release.

In 1975, Hamburg became president of the Institute of Medicine, the health policy branch of the National Academy of Sciences, and from 1980 to 1983 he taught health policy and served as director of the Division of Health Policy Research and Education at Harvard University, applying a cross-disciplinary approach to health-policy issues.

Hamburg became president of Carnegie Corporation of New York in 1982 and served in that role until 1997. As president, he expanded Carnegie's work in education and healthy development of children (part of which was Hum Bio's Middle Grades Life Science Curriculum Project). As well, he created Carnegie programs on international peace; human resource development and democratization in Africa, Eastern Europe, and the U.S.; and prevention of violent conflict among nations. With a strong interest in furthering international peace, he served on committees such as the U.S.-Soviet Joint Study Group on Crisis Prevention, the Defense Policy Board of the Department of Defense, and the Carnegie Commission on Preventing Deadly Conflict. He also chaired several groups in science policy, such as the advisory boards of the National Institute of Mental Health and the National Science Foundation. From 1988 to 1995, Hamburg was a member of Stanford's board of trustees.

In 1996, Hamburg received the Presidential Medal of Freedom, the highest honor given by the U.S. government to civilians. In 1998, the Public Welfare Medal, the highest honor given by the National Academy of Sciences, was awarded to him for his extraordinary use of science for the public good. Hamburg was cited for his effective leadership of Carnegie Corporation, his efforts to prevent violent conflict among nations, and his dedication to improving life for young people.

JOSHUA LEDERBERG

Nobel laureate Joshua Lederberg was head of genetics at Stanford School of Medicine when he founded Human Biology. Lederberg had won the 1958 Nobel Prize (at the age of 33) for his groundbreaking research on genetic structure and function in microorganisms. As a professor in Human Biology, Lederberg opened students' eyes to the implications of emerging biological knowledge, addressing such topics as the evolution of bacteria to adapt to antibiotics, the uses and abuses of genetic technologies, and ethical issues in organ transplantation.

After teaching for several years in Hum Bio, Lederberg left Stanford to become president of the Rockefeller University, where he is now president emeritus. In addition to his research on bacterial genetics, Lederberg has also been involved in NASA's search for life on Mars and in artificial-intelligence research. He has served on the World Health Organization's Advisory Health Research Council, on the Technology Assessment Advisory Committee of the U.S. Congress, and as chairman of the President's Cancer Panel. A member of the National Academy of Sciences, Lederberg was awarded the U.S. Medal of Science in 1989. Today, Lederberg continues to investigate bacterial genetics at the Rockefeller University as a Sackler Foundation scholar and professor emeritus of molecular genetics and informatics.

As Organism." The course provided an opportunity to develop an integrated approach to studying the biology of humans. Course material included human evolution; genetics; social, political, and ethical issues raised by new medical technology and biological research; and case studies of human diseases that considered relevant information from politics, economics, and psychology as well as biology. The new course was successful and popular with students.

Hamburg and Lederberg shared another goal—to introduce more undergraduate students to the broad integrative "human biology" approach they were developing in "Man As Organism." They felt that undergraduate education in biology should include subjects that then were offered only in graduate courses and medical school. When they questioned students and faculty about whether undergraduates were interested in taking courses that used such an approach, they received overwhelmingly positive responses.

However, while these ideas were being explored tentatively at Stanford, the impetus to create a new interdisciplinary program came from a correspondence between David Hamburg

This committee was an exceptionally powerful force at Stanford because its members, representing six different undergraduate and medical-school departments, were highly respected scholars, and several were current or former department heads.

and Lawrence Hinkle, a professor at Cornell University's medical school and consultant to the division of national affairs of the Ford Foundation. The two men had become acquainted through Hinkle's interest in the innovative "Man As Organism." Like Hamburg, Hinkle felt that a new, more integrated approach was needed in teaching the biological sciences to undergraduate students. He viewed the course taught by Hamburg and Lederberg as an encouraging first step toward this goal and wanted to explore the possibility of creating an expanded program of coordinated courses. As well, Gordon Harrison, Ford Foundation's officer in charge of resources and environment, was interested in the interdisciplinary approach taken by Paul Ehrlich's research on population and his book *The Population Bomb*. In late 1968, Hamburg and Ehrlich met with Hinkle and Harrison at Ford headquarters in New York to discuss their ideas.

At Hinkle's request, Hamburg organized a committee of prominent Stanford faculty members to meet and further discuss with Hinkle and Harrison the possibility of a new interdisciplinary approach to the study of biology. These seven committee members, who with Colin Pittendrigh became the founders of Stanford's Human Biology Program, were Paul Ehrlich (biology), Sanford Dornbusch (sociology), David Hamburg (psychiatry), Albert Hastorf (psychology), Donald Kennedy (biology), Norman Kretchmer (pediatrics), and Joshua Lederberg (genetics). This committee was an exceptionally powerful force at Stanford because its members, representing six different undergraduate and medical-school departments, were highly respected scholars, and several were current or former department heads. Lederberg, a Nobel laureate, headed the medical school's genetics department; Hamburg, Kretchmer, and Kennedy chaired their departments; Dornbusch had chaired sociology for five years and would later chair Stanford's academic senate and advisory board; and Hastorf, former head of psychology, would soon become dean of humanities and sciences. Paul Ehrlich was well-known for his pioneering research, writings, and excellent teaching and administrative skills.

Initially, the committee envisioned a brief series of related courses or seminars. However, after meeting with the committee in January 1969, an enthusiastic Hinkle and Harrison asked that

The Ford Foundation agreed to provide a grant of $1,936,000 for the five-year trial period, and the Human Biology Program was launched.

Stanford submit a proposal to Ford for a larger interdisciplinary program involving the biological and social sciences. The committee immediately began to plan a comprehensive program and formulate a proposal. They aimed to create a new curriculum that would prepare Stanford undergraduates for a wide range of professions including urban planning, sociology, resource management, law, and politics as well as medicine and the biological sciences.

Stanford's president, Kenneth Pitzer, was enthusiastic and supported the committee's endeavors. Committee members interviewed the heads of Stanford's social-sciences departments —sociology, psychology, anthropology, economics, and the Food Research Institute—to discover whether these departments offered courses related to human biology or would participate in such a program. Most department heads were interested in the idea, although some expressed concern about the university's ability to pay for a new program. Surveys of students confirmed that there was much interest in having a complete program that would offer a major in human biology.

Meanwhile, the biology department under Donald Kennedy's leadership recruited Colin Pittendrigh, eminent biologist and dean of the graduate school at Princeton University, to join the biology department at Stanford and participate in establishing a new human-biology program. Pittendrigh came to Stanford and became Human Biology's eighth founder, profoundly influencing the new enterprise.

The committee drafted its proposal and, on March 21, 1969, Stanford formally submitted "A Proposal for an Undergraduate Program in Human Biology" to the Ford Foundation. The document described the reasons for developing the interdisciplinary program, timetable for implementation, planned use of existing Stanford resources, projected budget for 1970–1975, and an innovative curriculum whose design was

> directed at two interlocking aims … that could be paraphrased as
> (1) 'humanizing' biology, and
> (2) 'biologizing' human studies (psychology, sociology, anthropology, and politics).

Once the proposal had been submitted, Sanford Dornbusch and Norman Kretchmer were given the task of negotiating a grant with the Ford Foundation. The committee realized that in

addition to operating expenses, an adequate independent endowment for faculty was critical to the viability of the new interdepartmental program. Without an endowment, the program would alienate the traditional academic departments by having to compete against them for university money to hire faculty. The Ford Foundation offered its "maximum" grant of $1 million to fund a five-year trial period. The committee knew this was not enough and, though fearful of losing all, felt compelled to refuse the offer.

After further discussion, however, the Ford Foundation agreed in September 1969 to provide a grant of $1,936,000 for the five-year trial period, and the Human Biology Program was launched. The Ford grant was apportioned so that $1.6 million was allocated to create endowed professorships in Human Biology and $336,000 was marked for operating funds to implement the program. The active support of Stanford's president Kenneth Pitzer and provost Richard Lyman encouraged Ford to fund Human Biology at the level needed to ensure viability. The university contributed substantially by agreeing to pay for office staff and facilities for the program.

PAUL EHRLICH

Professor of biology when he founded Human Biology, Paul Ehrlich is regarded by many as Stanford's leading evolutionist. He is cofounder with Peter H. Raven of the idea of coevolution. A world-renowned population biologist, Ehrlich has pursued long-term studies of the structure, dynamics, and genetics of natural butterfly populations. For decades, through research, writing, and speaking, he has sought to heighten international awareness of the human population explosion and the devastating effects of its impact on environmental resources. He is acclaimed for numerous articles and books, including *The Population Bomb* (1968), *The Race Bomb* (with Shirley Feldman, 1977), *The Population Explosion* (with Anne Ehrlich, 1990), *Betrayal of Science and Reason: How Anti-Environmental Rhetoric Threatens Our Future* (with Anne Ehrlich, 1996), and *Human Natures: Genes, Cultures, and the Human Prospect* (2000).

Among Ehrlich's numerous awards are the Crafoord Prize for his work in population biology and the conservation of biological diversity, from the Royal Swedish Academy of Sciences (1990, given in lieu of a Nobel Prize in areas where the Nobel is not given); a MacArthur Prize fellowship (1990); the John Muir Award of the Sierra Club; the Gold Medal Award of the World Wildlife Fund International; and the United Nations Sasakawa Prize for the Environment (1994). The Ecological Society of America recently honored him with its 2001 Eminent Ecologist Award. He continues his research and teaching at Stanford as Bing Professor of Population Studies in the biological-sciences department and as president of Stanford's Center for Conservation Biology.

SANFORD DORNBUSCH

When sociologist Sanford (Sandy) Dornbusch was asked to help found Human Biology, he had already founded Stanford's modern sociology department, which he then chaired. The second Reed-Hodgson Professor of Human Biology, he taught regularly in the program from 1970 until the mid-1990s. His lectures for the core, packed with an extraordinary amount of information, were admired by students and teachers alike. Colleague Shirley Feldman, who taught with Dornbusch in the core and for whom he has been an important mentor, describes him as a man of exceptionally strong character who "speaks his mind on anything, without rancor and without animosity. He is a man of vision and enormous energy … he never promotes himself, but works for the common good."

Throughout his career at Stanford, Dornbusch has been an eminent university figure, having served as director of the Stanford Center for the Study of Families, Children and Youth; director (and founder) of Stanford's Curriculum on Children and Society; and co-founder of Stanford's Center on Adolescence. He also was elected to head Stanford's academic senate (1970–71) and advisory board (1971–74).

A pioneer in several fields of sociology, Dornbusch was one of the first to do empirical research on the institutionalization of ethnic and gender inequalities in the American school system. He served as president of three sections of the American Sociological Association (methodology, social psychology, and education). Among his many honors, Dornbusch has received the Distinguished Achievement Award for Excellence in Educational Journalism and Stanford's Walter J. Gores Award for Excellence in Teaching. In 1992, he was the first non-psychologist to be elected president of the Society for Research on Adolescence. Currently, as professor emeritus, Dornbusch continues his research and serves on the advisory board of Stanford's Center on Adolescence. In 1996, he co-authored two books, *Beyond the Classroom* and *Children after Divorce*.

Dornbusch continues to be a loyal supporter and wise advisor for Human Biology. In 1995, he remarked about his long association with the program, "Almost nothing lasts, so it's really pleasant to be part of something that not only lasts but is constantly evolving."

In addition, the founders and the university decided that Ford's endowment should be used as the base upon which to create four endowed chairs with matching funds from other donors, each chair to be named for the donor who contributed the matching funds. Thus, with the Ford grant providing 50 percent of the required money, the university established and donors endowed four professorships in Human Biology. These endowed chairs help support the program today: the Bing, Reed-Hodgson, Josephine Knotts Knowles, and Benjamin Scott Crocker professorships.

Stanford faculty generally supported the new Human Biology Program from its inception. Since the program planned to constitute a major, application was made to the academic senate for authority to grant bachelor's degrees. As David Hamburg later recalled, the faculty expressed a willingness to give the experimental program a chance. By December 1969, the senate had approved Human Biology as an undergraduate interdepartmental program.

In 1969, Ford's Gordon Harrison called Human Biology a "first step" toward mending the fragmented science of human behavior and creating an intellectual discipline to solve problems

Ford's Gordon Harrison called Human Biology a "first step" toward mending the fragmented science of human behavior and creating an intellectual discipline to solve problems of human adaptation to the environment.

of human adaptation to the environment. Harrison lauded "the willingness of members of various departments of social science to establish a common core course via a unifying biological view," and declared, "The Stanford program is a promising beginning.... It will be the first time that senior professors from a university medical school have undertaken major responsibility for undergraduate education." (*Stanford Observer*, November 1969) However, Hum Bio, as the program came to be called, encompassed much more. As founder Norman Kretchmer would later describe it, Human Biology sought to

> create a human biologist, a person knowledgeable about man—his function, behavior, and social patterns.... The development of a curriculum to educate a human biologist is an academic response to the need for trained personnel concerned with the complex relationship of man with nature as exemplified by the dilemmas of medical-social policy, population problems, pollution of the environment, and conservation of needed resources. We now need to produce policymakers and citizens who have an understanding of biological and behavioral principles. The undergraduate Program in Human Biology seeks to achieve this goal; it also seeks to provide an alternative route for advanced study in the established biological and behavioral sciences.... Our program concerns man as an organism, his adaptation to other men and to nature, his ability to control and to live with his environment, and the mechanisms by which these factors relate to his biological and social evolution. (*Campus Report*, March 18, 1970)

The Early Seventies

1970 A committee in charge is created for the Human Biology Program; Norman Kretchmer becomes the first director.

1970 Spring quarter: Hum Bio offers its first course, "Man and Nature."

1970 April: first Earth Day

1970–71 Hum Bio begins offering the core course sequence. Course assistants, student advisors, areas of concentration, and workshop program are established.

1971 The Bing Professorship in Human Biology is established.

1972 Robert Sears becomes director.

As soon as Ford Foundation funding was received in 1969, the founders began to set up Human Biology. Since this pioneering program combining biological, medical, and behavioral sciences was the first of its kind at a major university, there was no prior experience to aid planning. Advice and support were sought throughout the university, and the response was encouraging. Students, faculty, and administration were enthusiastic.

Unique characteristics that continue to define Hum Bio today were important elements at the outset. Hum Bio was to be an undergraduate interdepartmental teaching program, drawing upon faculty from all schools of the university. Stanford's medical-school faculty would be an important resource. There would be no full-time permanent teaching appointments. Instead, Hum Bio faculty members would come from and continue to hold academic positions in university departments. As well, Hum Bio would seek to augment its staff with visiting professors.

The absence of tenured appointments would ensure that faculty who taught in the program did so solely out of interest in teaching undergraduate students. Faculty who did not maintain the high level of teaching excellence the program demanded could be dropped. The fluid approach of "sharing" faculty with departments allowed for flexibility and inclusion of many areas of expertise. It provided unique opportunities for professors from different departments to collaborate in creating new interdisciplinary courses.

Student advice was sought and acted upon from the start. Many contributions to initial program planning came from biology students who in 1968 had organized the Stanford Population and Environment Forum. Hum Bio's first governing body was called the committee in charge and consisted of the eight founders and four students (David Coleman, Rod Levine, LuAnn Hall, and Nickolas Waser followed by Vincent Siciliano). In an unprecedented effort to involve students in the formation of Human Biology, in February 1970 the committee in charge held an "open discussion" of the program's goals and objectives in Tresidder Union, requesting input from the university community.

In defining Hum Bio's goals, Norman Kretchmer stated that:

> The motivating thread of interest for students is man in relation to his environment. In addition to students' gen-

eral interest in this field, Human Biology will provide a sound base for graduate and professional work in many areas of specialization. Human Biology does not plan to present courses designed to teach about specific issues such as birth control or pollution. Rather, Human Biology wants to inculcate in the student an awareness of social and biological problems and a desire to learn enough to be capable of doing something about them. (*Stanford Daily,* March 18, 1970)

Kretchmer, who had relinquished his position as head of the pediatrics department in the medical school, agreed to chair the committee and serve as Hum Bio's director. Sophie Alway, a pediatrician who had worked at the medical school, became the first program coordinator and advisor. She recruited program secretary Tibby Simon, who assisted her in setting up administrative procedures and running the program's day-to-day operations out of a small office in Building 80.

A Curriculum Is Established

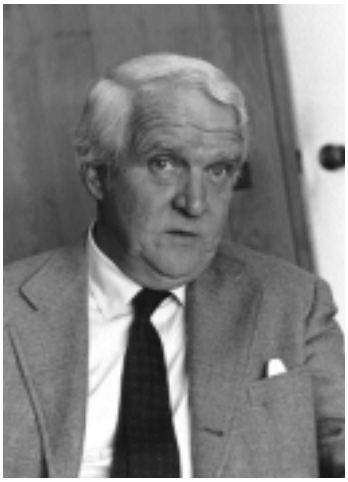
In establishing a curriculum, the first challenge—and a continuing one for Human Biology through the years—

NORMAN KRETCHMER

Chairman of Stanford medical school's pediatrics department when Human Biology was created, founder Norman Kretchmer became Hum Bio's first director. A strong and devoted leader, Kretchmer enjoyed working with undergraduates. He was an expert on child nutrition and the author of numerous books, articles, and essays on the subject. He also did pioneering studies of lactose intolerance among diverse racial and ethnic groups.

After serving as Hum Bio's director, Kretchmer went on to become director of the National Institute of Child Health and Human Development. Subsequently, he joined the medical faculties of the University of California at Berkeley and San Francisco. Among his many honors, he was elected to the National Academy of Sciences Institute of Medicine and served as president of the Western Society of Pediatric Research and the National Society for Pediatric Research. Norman Kretchmer died in 1995, leaving an extensive legacy of teaching and research, a notable part of which was his innovative work in founding and guiding Human Biology.

The Human Biology core as originally conceived consisted of a freshman course, "Man and Nature," (central circle) and eight sophomore courses (larger concentric circle). Areas of concentration "radiated" from the core. (Kretchmer, "The Creation of a Human Biologist: A New Curriculum," *The Pharos of Alpha Omega Alpha,* Vol. 34, No. 2, April 1971)



COLIN PITTENDRIGH

Biologist Colin Pittendrigh was dean of the graduate school at Princeton in 1969 when he was recruited to come to Stanford to join the biology department and help launch Hum Bio. He immediately became very involved in planning the program and making it a success, teaching the popular introductory class "Man and Nature." Recognizing his crucial contribution, the program named him to an endowed chair, the Bing Professorship in Human Biology.

Pittendrigh also served as director of Stanford's Hopkins Marine Station in Monterey. In his eight years at Hopkins, he built up the program, hiring new teaching talent and expanding the research. An Englishman who had come to the U.S. to study soon after World War II, Pittendrigh was renowned for his research on body rhythms and biological clocks in animals. He received numerous awards for his work, including a Guggenheim Fellowship and the Alexander von Humboldt Prize.

Above all, Pittendrigh was famous for his extraordinary teaching. He was such an exceptional lecturer that other professors would attend his lectures to see what made them so successful. As his colleague Sandy Dornbusch has recalled, "I went to try to figure out what his tricks were.… Everybody who was lucky enough to be a student of his remembers his great lectures." Pittendrigh often incorporated stories of his own life into his lectures and was famous for his entertaining anecdotes.

Though Colin Pittendrigh died in 1996, his inspirational teaching is well remembered. As Sandy Dornbusch recalled, "He once said to me that although he was a pretty well-known researcher and had been dean of the graduate school at Princeton, friends thought he would be remembered as a great teacher, and that gave him enormous satisfaction. He preferred teaching to everything else."

was to pull together many diverse subjects and concerns to establish a cohesive program. As Norman Kretchmer observed, "Our first problem is to define human biology, for if the phrase be taken literally, it could occupy an entire school or university." (*Stanford Daily*, October 13, 1970)

The curriculum was envisioned as offering interdisciplinary courses that linked biological science with social science and public policy. Also, subjects such as nutrition, virology, and behavior genetics, previously offered only for graduate study in the medical school, would become part of undergraduate courses. Introductory study of the social sciences was to be consolidated, so students could learn basic principles in one place rather than in separate, sometimes redundant classes in psychology, sociology, anthropology, political science, and economics.

With these considerations and the overarching goal of "humanizing" biological studies and "biologizing" human studies in mind, the founders developed the idea of two parallel one-year basic "core" courses in the natural and social sciences for all Human Biology majors. These fundamental classes would introduce students to the study of humanity's

biology and behavior from many perspectives, providing a broad base on which to build. Following the core studies, Hum Bio's curriculum would consist of upper-division courses, which were more advanced and centered on particular issues, topics, or areas of interest.

By spring quarter 1970, Human Biology was ready to offer its first class, an introductory one-quarter course entitled "Human Biology 1: Man and Nature." As described in Stanford's *Courses and Degrees* bulletin, Human Biology 1 was "primarily concerned with broad outlines of the origin and history of life, with special emphasis on the evolution of the vertebrates and the primates.... The quarter will close with a discussion of the biological uniqueness of man." Enrollment of about 50 students was expected, but to everyone's amazement 427 students registered for the course! The professor, Colin Pittendrigh, was a renowned biologist as well as a gifted teacher famous for his ability to present complex material in exciting and creative ways. In one memorable Hum Bio lecture, he discussed a discovery that linked a malaria epidemic and mosquito populations in Trinidad to bromeliads growing in coffee plantations there. To illustrate his points, his teaching assistants lowered bromeliads from the rafters of the lecture hall. The dynamic combination of Professor Pittendrigh's teaching and the vital topics covered in Human Biology 1 ensured its popularity: the following year, 450 students enrolled.

More courses were offered immediately, and Hum Bio quickly became one of Stanford's most popular majors. By spring of 1971, 240 students had declared it their major. Clearly, Human Biology had tapped an unmet educational need and was off to a roaring start. Who were the students enrolled in Hum Bio? The group was heterogeneous, consisting of students who would later become medical doctors, social scientists, engineers, biologists, teachers, business people, lawyers, and policymakers. They all shared the goal of understanding the balance between biology and social science, and of grasping the complex relationship between people and their environment.

The new Human Biology major had so many students that it could hardly meet the demand for courses and faculty. Students and faculty alike were excited about the program. The early 1970s were a time of ferment and change. Hum Bio was seen as a significant

As an undeclared freshman in 1970, I heard about a new major called Human Biology that offered a broad approach to biological studies. I attended the introductory course spring quarter taught by Professor Pittendrigh, and I was hooked. The intriguing proposition that all of life, from single cells to societies, is just 'trying to make a living' launched me into the Human Biology Program. Over the course of my life, I have found reason and understanding within the context of 'making a living.' Thank you, Professor Pittendrigh.

—Carol Crosby Brown, class of 1974

Spring quarter of my freshman year the first Hum Bio class was taught by Colin Pittendrigh. The first session discussed bromeliads and received a standing ovation. Instruction on day two also resulted in a standing ovation.

—Elizabeth Stone Hill, class of 1973

I'll never forget Colin Pittendrigh, who taught with great flair, and his famous phrase, 'Ontogeny recapitulates phylogeny!' . . . I was also mesmerized by Jane Goodall, who taught part of the core, with her wonderful slides of chimps and her clear love of her work. Back when I was in Hum Bio, it was a 'new' major, looked upon with some suspicion by non-Hum Bio students and faculty alike. I think there was concern that we were somehow sliding by or that the major lacked academic rigor. By the time I graduated, however, that feeling had been replaced by respect.

—Janet Maines Peterson, class of 1975

experiment, an attempt to relate academic education to the problems and needs of society; people wanted to be part of it and see it succeed. This gave great energy to the program and helped to attract students and teachers.

Along with the pleasures of success, the immediate popularity of Hum Bio created some growing pains in the program and anxiety among the founders. They had envisioned a small program that would gradually evolve, but suddenly they were faced with demand for a fully developed major for almost 10 percent of the undergraduate population. Hum Bio was a pioneer; no blueprints for a curriculum existed. Colin Pittendrigh described his thoughts:

> I'm excited about the Human Biology Program.... I am, however, worried about it. Nobody has ever done such a program before. We're not sure what ought to be done. We all have intuitive feelings, but we need more faculty discussion among the seven of us who are teaching. We're going to have a go around the circuit once or twice before we thoroughly know what we're doing. (*Stanford Daily,* October 15, 1970)

Fortunately, the founders, who all taught in the program, had excellent "intuitive feelings" and were determined to see Hum Bio succeed. Program secretary and administrator Tibby Simon admired how the faculty was able to put aside occasional strong differences of opinion and work together for the good of the program. "They all had strong personalities and ideas, but they put the welfare of Hum Bio above their individual ambitions," she said. This spirit of cooperation, remarked upon by many who watched Hum Bio develop, was a key element of its success and longevity.

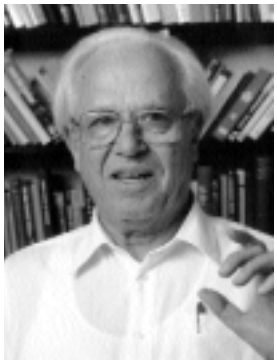
During the early years, the core coalesced into a yearlong series of parallel A (natural science) and B (social science and policy) lecture courses that met back-to-back three days a week and included additional section meetings. Every Hum Bio student was required to take a full year of A and B core courses. The core content was continually evaluated and revised. Creating the core syllabus presented a continuing challenge to coordinate the natural and social sciences and apply them to policy questions. Hum Bio faculty were so excited about the new courses that they often attended each other's lectures. Besides Hum Bio founders and directors, faculty who taught core courses in the early 1970s included Alberta Siegel, Keith Brodie, John Gurley, Peter Corning,

John Adams, Jack Barchas, Luigi Cavalli-Sforza, Jane Goodall, and Herant Katchadourian.

Upper-division courses were created with several goals in mind: to cover topics in specific disciplines important to Human Biology but not offered by the departments; to present unique disciplines not offered anywhere at Stanford; and to explore interdisciplinary topics emphasizing convergence of the biological and social aspects of human biology. At first, upper-division courses were seen as falling into two general categories: the biology of man and population, environment, and policy. Though Hum Bio majors were asked to focus on one category, they were required to take some courses in the other as well. Early innovative courses included study of health as human ecology (taught by Joshua Lederberg), political processes and human biology (Sandy Dornbusch), nutrition (Norman Kretchmer), genetics (Luigi Cavalli-Sforza), biosocial aspects of birth control (Carl Djerassi), human aggressiveness (David Hamburg), psychobiology (Keith Brodie), biological chemistry (Nicholas Hoogenraad), the biology and psychology of intelligence (Shirley Feldman and Marc Feldman), and the man-made environment (Garth Collier).

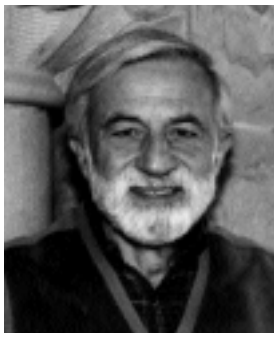
Beginning in 1971, a pioneering introductory course was added to the Human Biology curriculum—"Human Biology 10: Human Sexuality"— taught by Herant Katchadourian, a professor of psychiatry. In its first year 1,035 students took the course, and similar numbers of students enrolled every year thereafter through 2001. In praising Hum Bio's innovative spirit, Katchadourian says, "It is hard to imagine what department would have offered a course such as Human Sexuality at that time. The same is true for other courses I have initiated over the years, such as my seminar on guilt."

Many students were attracted to Hum Bio because they wanted to learn how to solve environmental problems. In addition to courses focusing on environmental issues, Hum Bio sponsored many symposiums and other activities in this area, beginning with the first Earth Day in April 1970, when founder Joshua Lederberg led a panel discussion on local ecological problems. Starting in 1971, the Stanford Conservation Group and other student groups worked with Hum Bio in setting up seminars and SWOPSI (Stanford Workshops on Political and Social Issues) workshops on topics such as urban development,



Luigi Cavalli-Sforza

Carl Djerassi



Herant Katchadourian

Shirley Feldman

As I look back over the years since Stanford, I can see that my Hum Bio experiences have had a profound influence on many aspects of my life, from the career paths I've chosen and the government policies and leaders I choose, to the foods I eat and the stories I tell my kids. They've even seen my imitation of Professor Pittendrigh's rendition of the mating dance of tropical **ground birds.**

—Murray F. Mlady, class of 1970

water and air pollution, and occupational diseases of farmworkers caused by pesticides.

Because its professors included some of the most exciting and accomplished scholars and educators at Stanford, Hum Bio became known for great teaching and for faculty who took an active interest in undergraduate education. Some of the founders continued to teach in the program and were joined by many others. Because of the unexpectedly large number of students Hum Bio had attracted, additional faculty were needed, but program funding was tight. The founders, particularly David Hamburg, actively recruited faculty from their own and other departments. Hamburg as head of psychiatry could, as he put it, "bootleg" faculty in his own department to teach in Human Biology. In an article titled "Human Bio Offers Exciting Profs," the *Stanford Daily* reported:

> The Human Biology Program, initiated with fanfare two years ago, has more than tripled its enrollment in the last year.… The most outstanding feature of the program is the high quality of instruction. Nearly everyone agrees that the 'exciting' professors gravitate to Human Biology. Another interesting comment is that Human Bio professors are more politically active than their fellow faculty members.
>
> Whether or not this is directly related to their popularity is debatable, but there is little debate over the fact that professors like Norman Kretchmer, Colin Pittendrigh, Donald Kennedy, and Paul Ehrlich are representative of the kind of first-class instruction available in the program. (*Stanford Daily,* October 22, 1971)

As well as temporary faculty appointments, Hum Bio tried to hire faculty who would remain over time and provide continuity by teaching in the core, administering the program, and developing its curriculum. One of the first to be hired was Shirley Feldman, who held an appointment in the psychology department. As a psychologist researching issues in childhood and adolescent development, she was devoted to undergraduate education and appreciated Hum Bio's interdisciplinary approach to problem solving and research. Besides coordinating B-side core classes and teaching seminars on adolescence and child development, she eventually became Hum Bio's associate director and for many years headed the program's upper-division committee, which

generated and evaluated new courses. "A great thing about Shirley Feldman is her superb organization skills," says colleague Bill Durham. "I remember attending her core lectures in the 1980s, looking for ways to hook together some themes for fall and winter core classes. I noticed then that her lectures flowed like a perfect outline—succinct, methodical, and logical. Whether in class, the upper-division committee, or the honors program, we look to Shirley as a source of sound logic and organization."

Areas of Concentration and Workshops

During the early years, issues arose whose resolution shaped Hum Bio's structure and character. Debate sometimes focused on the issue of breadth versus depth in the curriculum. Since Human Biology was so broadly based, faculty became concerned that the curriculum provided only a superficial understanding of many concepts. Students expressed similar concerns. As one alumnus wrote in an early questionnaire, "Force people to specialize a bit. Human Biology was such a muddle that a student could wallow through it being highly enthusiastic about all the random tidbits that were thrown out at him and never think. Introduce some rigor."

In response to this concern, Colin Pittendrigh proposed that an "area of concentration" become a required part of each student's program of study. He suggested that each student design his or her own curriculum by choosing a focus (area of concentration) within the Human Biology major. The student would then take a series of upper-division courses in Hum Bio and other departments that were aligned with that theme. Areas of concentration spanned an enormous array of disciplines, from child psychology to molecular biology. The approach emphasized the Hum Bio hallmarks of flexibility and active student participation, as each student worked with an advisor to construct his or her individual program.

Student questionnaires highlighted a second need: students wanted to apply their Human Biology knowledge to practical situations. As one questionnaire response stated, "I think some effort should be made … to force students to get their hands dirty in the 'real world' and let them apply some of the principles they've learned in Hum Bio courses to actual situations."

Practical field experience had been

Hum Bio was a wonderful major and in retrospect very reflective of my career path. I became an attorney for social activist/ environmental work … then seven years ago returned to school to become a psychotherapist. Hum Bio set the stage for an expansive view of careers and life. My specific memories are primarily of being a student at the Gombe Stream Research Centre. That was the most profoundly life-changing experience I've ever had besides the birth of my triplets.

—Sara M. Simpson, class of 1974

I came to Stanford as a chemical engineering major, found engineers to be too boring, then tried chemistry, geology, psychology, and biology—all in my first few months. I settled into Human Biology because of the match between 'hard' biological science and the social sciences. I was interested in behavior, but I was disappointed that the social sciences lacked any evolutionary perspectives. I guess I was already convinced of the famous quote that 'nothing in life makes sense without evolution.' Hum Bio promised to bridge that gap.

My most important recollection is the day Paul Ehrlich came back from a trip to Africa, showed slides of Tanzania, and announced rather ominously that 'anyone who wants to see wild Africa better go quickly, because it will be gone in another few years.' A Hum Bio announcement informed the class that that same day was the deadline to apply to work with Jane Goodall at Gombe. I had no idea who she was, but I liked the idea of going to see a zebra in the wilds of Africa. I applied, and my life was changed forever. I count myself as one of the luckiest people on the planet. I oversee exciting projects in Africa, including the Serengeti Lion Project, travel to East and South Africa every year, and take great satisfaction from the challenge of my work. I can't imagine a better life, and I owe it all to that one day in class in 1971.

—Craig Packer, class of 1972

envisioned by the founders as an important part of the program. Soon it became a requirement for the major. Each student was required to design a "workshop" (now called an internship) that provided laboratory or field experience in his or her area of concentration. An extensive workshop program was developed under the direction of Sidney Liebes. Liebes, a research physicist who had worked in genetics with Joshua Lederberg, taught a Hum Bio course on society's use of energy and was active in environmental and conservation issues. He was enthusiastic about the workshops, since he believed strongly that experience with projects and problems outside of the classroom should be an important part of the Human Biology education.

Liebes encouraged students to become involved in a wide range of workshop experiences. Each student wrote a "workshop proposal" that was reviewed by a faculty member who became the student's workshop advisor and to whom the student submitted a report at the workshop's conclusion. Many of the workshops involved apprenticeships in community-service organizations and medical clinics. Students also worked as interns in architectural firms, city-planning offices, and government agencies; conducted fieldwork such as demographic studies of Bogotá squatter populations; volunteered in programs for the disabled; and pursued laboratory projects such as assisting Nobel laureate Linus Pauling in his biochemistry research. One of the first workshops was a team research project headed by student (now Hum Bio professor) William Durham to investigate whether air pollution affected the health of college students in the Los Angeles basin. Another workshop involved a study of mass-media coverage of environmental problems. A number of workshops were done at Stanford's Hopkins Marine Station in Pacific Grove, which was headed by Professor Pittendrigh.

One of the most memorable early fieldwork experiences occurred at the Gombe Stream Research Center in Tanzania. David Hamburg, who was interested in primate research, coordinated an overseas program that allowed eight Hum Bio students each year to study the social behavior of chimpanzees under the guidance of world-renowned primatologist Jane Goodall at her Gombe facility. The six-month fieldwork program was very popular in spite

Jane Goodall greets a young chimpanzee at Gombe Stream Reserve, 1971.

of its extreme rigor. Students who applied to work at Gombe were required to take a preparatory seminar in primate behavior taught by David Hamburg and Jane Goodall. For several years beginning in 1972, Goodall was on Stanford's faculty and taught a Hum Bio core course and the seminar on primate behavior. She divided her time between Gombe and Stanford, and with David Hamburg developed an outdoor primate research facility at Stanford, informally called Gombe West, that operated for a few years and provided research opportunities for Hum Bio students.

Student Involvement: Teaching and Advising

From the beginning, Hum Bio administrators actively solicited student opinion and considered it important. Course evaluations were taken seriously, and, as today, each evaluation was read by at least four faculty members. The Hum Bio founders had envisioned a program that would not only serve undergraduate students, but would also empower them. Thus, Hum Bio undergraduates were entrusted with degrees of responsibility and authority unmatched by any university department. Students participated in program administration, serving on the executive and curriculum committees. They helped to design their own majors by choosing areas of concentration and workshops. In addition, selected undergraduates were given the responsibilities of teaching and advising their fellow students.

As Hum Bio became a popular major, with several hundred students in the core, an acute need for teaching assistants developed. Faculty were too busy in their departments to teach the discussion sections, evaluate papers, and grade exams. Without graduate students, Hum Bio lacked the usual candidates for these vital roles. The program solved the problem by recruiting teaching assistants from among the top upper-class Hum Bio majors. These course assistants, or CAs as they came to be called, would serve as the link between students and faculty. Eventually, the undergraduate CAs were largely replaced by recent graduates, who were slightly older and more experienced. They were and still are the teachers, role models, and advisors for sophomore Hum Bio students

Eight months studying mother-infant relationships under Jane Goodall's direction at Gombe was a peak experience. I learned a great deal about baboons, a fair amount about chimps, a lot about people.… I have been blessed, working as a venture capitalist since 1980, investing capital in startup companies and working to help them succeed.… Human Biology touches on every element of the human endeavor—biology, theology, economic imperative, territoriality, sociology, psychology, physiology, culture. This serves the venture capitalist well.… The program taught me to think in systems, cause and effect, relationships.

—Grant Heidrich, class of 1974

SAs gather for a meeting in their office, May 2001.

making their way through the core.

Hum Bio's requirement that students design their upper-level major curriculum through areas of concentration and workshops called for a great deal of individual planning and exploration of available options. Faculty advisors served a vital role, but additional help was needed. Again, the program turned to its own students for inspiration, and Hum Bio's student advisors, or SAs, were created in 1971. The early student members of Hum Bio's committee in charge served as the first SAs. Soon, as the number of Hum Bio majors increased, six or seven Hum Bio upperclass majors were chosen as SAs each year. The approach was successful, and SAs became an important part of Human Biology. As Norman Kretchmer remarked, "Students make excellent advisors to other students. They don't hesitate to tell the real truths about a course." The SAs helped each student design an individualized curriculum, which was then presented to a faculty member for discussion and final approval. The SA idea spread to many departments on campus and eventually inspired the university-wide Advising Associates program. In 1979, Hum Bio SA Alison Ross received the Dinkelspiel Award for helping to start that program.

Human Biology's Continuing Success

Unlike departments, which maintained extensive graduate-degree programs, Hum Bio's single focus was the education of undergraduates. The program's first years were so successful that some faculty and students wanted to add a graduate-student component. Many voices spoke against this change. Joshua Lederberg, among others, contended that the existence of a graduate program would undermine Hum Bio's commitment to undergraduate education. This argument prevailed, and Human Biology remains an undergraduate program. Over the past thirty years, this issue has surfaced many times, but Hum Bio has remained steadfast in its single-minded dedication to undergraduate students. This decision, however, has led to ongoing tension with the dean's office over funding for the program.

Hum Bio has employed more special

learning services than any university department: writing assistants, statistics tutors, and general learning assistants have been made available to help students. Despite struggling for scarce funds to keep afloat, Human Biology has found resources to enable these valuable tutors to assist its students.

Hum Bio's first director, Norman Kretchmer, served until 1972. He was followed by Robert Sears, David Starr Jordan Professor of Psychology, who directed Hum Bio until autumn 1973, when Donald Kennedy took the position for the next three years. Both the Ford Foundation and the university monitored Hum Bio's continuing development. Ford funding continued throughout the five-year trial period, until 1975. Stanford president Richard Lyman viewed the program favorably and supported Stanford funding for Hum Bio after 1975.

By 1973, Hum Bio's 320 majors made it Stanford's third-largest. Though it was viewed as extremely successful, the program continued to evaluate itself and evolve. Hum Bio's first handbook, written by students in 1973, summarized the program's development:

> People have been asking the question 'What is Human Biology?' for as long as the program has been around. The variety of responses attempting to answer this question may be an indication that there is no single answer. Human Biology is different for each individual who is connected with the program.… If there have been contradictions between the original goals of the Human Biology Program and the present-day realities, it is in part a reflection of the evolution of the program. It evaluates itself each year in light of student criticism and approval. Weak points have been spotted, and they are being strengthened. The strong points are recognized and reincorporated into the program as it develops anew each year. These initial years have seen much change and adjustment. The program has proven itself capable of standing on its own feet, but there are still problems to be met. A particularly big challenge for the program is the integration of fields which traditionally have been studied separately.… The program challenges its students to be creative themselves in planning a course of upper-division study which is cohesive, individualized, and intelligent. Anyone eager to accept this challenge will find Human Biology a meaningful major.

I was in the first group of SAs. My key memory of Hum Bio is excitement at the holistic approach to life. The capacity to think clearly about man and his environment is what I value most.

—A. Vincent Siciliano, class of 1972

The Mid and Late Seventies

1973 Donald Kennedy becomes director.

1973 The Reed-Hodgson Professorship in Human Biology is established.

1975 The Benjamin Scott Crocker Professorship in Human Biology is established.

1975 Hum Bio students are kidnapped at Gombe Stream Reserve in Tanzania.

1976 Audrey Bernfield is hired as director of advising and career counseling.

1977 Merton Bernfield becomes director.

1977 The Josephine Knotts Knowles Professorship in Human Biology is established.

1979 Lorraine Morgan is hired to coordinate the internship and honors programs.

Donald Kennedy Becomes Director

DONALD KENNEDY, a Hum Bio founder, became program director in autumn of 1973. He remained in this role until 1977, when he left Stanford for two and a half years to serve as commissioner of the U.S. Food and Drug Administration. By the mid-1970s, the Human Biology Program had established itself as a viable enterprise and one of Stanford's most important undergraduate educational resources.

Kennedy took on his job as director with much enthusiasm and dedication. He had continued his involvement throughout Hum Bio's early development and was committed to Hum Bio's interdisciplinary, policy-oriented approach. He believed that Hum Bio had successfully incorporated and acted upon students' desires for participation and relevance in education. He felt these were important educational goals and wanted to further them.

Everyone was impressed with Kennedy's dynamic teaching and the amount of time and attention he focused on the program. Workshop director Sidney Liebes remembers being amazed that Kennedy seemed to know all the students in the core and everything that went on in the program. Kennedy thought it important for introductory courses such as the Hum Bio core to receive the best and most carefully prepared teaching possible. Dolly Ester Madden, program administrator in the mid-1970s, remembers Kennedy spending huge amounts of time on his core lectures and saying he felt nervous before each one. He told her that if he didn't feel nervous before lecturing, then he'd know it was time to stop teaching.

CURRICULUM IS REVISED

Having taught in the core, Kennedy was familiar with the challenges inherent in attempting to coordinate A- and B-side course material. He resolved to review and improve the core as well as Hum Bio's upper-division course offerings. To that end, he initiated major evaluations of Hum Bio's curriculum, searching for new ways to present material that would develop students' analytical skills, stimulate creative thinking, and relate academic learning to public-policy issues. He was not afraid to experiment with new educational approaches, once instituting a "policy spring," in which the regular curriculum was set aside while faculty and students were all

assigned to small groups to study and debate public-policy issues.

Kennedy set out to improve the coordination and coherence of the core. To enhance consistency of instruction, professors were encouraged to teach in several different core courses and to collaborate as a team. He emphasized the role of the CAs, involving them in revamping the course material. Kennedy and Herant Katchadourian collaborated in revising the core curriculum, trying especially to coordinate B-side policy studies with A-side science. The two professors spent many hours in Kennedy's living room, listing topics and ideas on index cards and arranging the cards across the floor, devising new patterns of linking and coordinating course material. Eventually, the core was substantially redesigned: course content was redistributed, more economics was taught in the policy areas, and anthropological perspectives were expanded.

Above all, Kennedy wanted to teach students to apply facts and concepts they had learned in the core in thinking analytically about societal problems and formulating public-policy solutions. To that end, with the CAs, he established sixteen core "policy groups" of ten to twelve students. Each group worked

DONALD KENNEDY

Donald Kennedy joined Stanford's biological-sciences faculty in 1960 and chaired that department when he helped to found Human Biology in 1969. His biological research focused on animal behavior and neurobiology, particularly the relationship between central-nervous organization and behavioral output. In both biological sciences and Human Biology, he became known as an inspiring and dedicated teacher. In 1976, he received Stanford's Dinkelspiel Award for his contributions to undergraduate education.

In teaching and research, Kennedy maintained a strong interest and involvement in public policy relating to biology. In the 1970s, on the National Research Council, he chaired a major study on alternatives to chemical pest control in agriculture and served on the executive committee of the World Food and Nutrition Study. In 1977, he left Stanford to become commissioner of the U.S. Food and Drug Administration under President Carter, guiding the administration through major controversies over banning saccharin, legalization of the untested cancer treatment laetrile, the approval process for drugs and medical devices, and the use of antibiotics in animal feeds.

Kennedy returned to Stanford in 1979 to serve first as university provost and then, from 1980 to 1992, as president. During his presidency, Kennedy remained loyal to Hum Bio, periodically lecturing in the core. After his presidential term, he returned as professor and coordinator for Hum Bio 4B, the core's spring-quarter segment. Today, he is the only Hum Bio founder still teaching in the program. A believer in team teaching and integration of material from A and B sides of the core, he has taught material across the Hum Bio continuum, from A-side molecular biology to B-side health and environmental policy.

Currently, as the Bing Professor of Environmental Science and a senior fellow at the Institute for International Studies at Stanford, his work focuses on interdisciplinary policy solutions for a range of health and environmental problems. In addition, Kennedy chaired the National Academy of Science's Committee on Teaching Evolution, which in 1998 published a guidebook to help high-school teachers explain evolution. He also serves as founding director of the Health Effects Institute, a nonprofit group that funds and evaluates research on mobile-source emissions. In June 2000, he began a term as editor in chief of *Science*, the journal of the American Association for the Advancement of Science.

Don Kennedy's lecture captures the interest of Hum Bio students.

My favorite Hum Bio memory is of Donald Kennedy demonstrating echolocation in bats by climbing up on the desk in the front of the room, making 'bat noises,' and flapping his arms. It was very funny, given what an important person he was. I've thought of it often over the years when other 'important people' take themselves too seriously. Human Biology in the '70s was really cool!

—Catherine Garzio, class of 1979

I will never forget Donald Kennedy getting up on the lab table at the front of the lecture hall and assuming a quadruped position to demonstrate to us the concepts of dorsal, ventral, cephalo, and caudal. His first concern was always with teaching effectively, not preserving his dignity!

—Ingrid Schwontes Jackoway, class of 1979

collectively for four weeks on a given policy problem and then presented its conclusions to the entire core class. Since no suitable textbooks existed for such exercises, the core professors and CAs compiled "case books" containing primary source material and statements of the policy problems to be considered. The policy problems covered a wide range of topics, including abortion and fetal research, the effect of agriculture on environmental quality, America's health-care system, and regulation of the world's ocean resources.

As well as the core, upper-division courses were revised and expanded. New courses in physiology, psychology of sex differences, intelligence, human survival in prehistory, the evolution of politics, and other subjects were introduced. A few upper-division courses, such as Carl Djerassi's "Biosocial Aspects of Birth Control," that had started with the program continued to be offered almost every year and became integral elements of the Hum Bio curriculum. Kennedy taught a policy course titled "Biosocial Aspects of Pest Control."

Additional faculty and sources of funding were needed. Kennedy strengthened Hum Bio by hiring short-term guest experts, visiting scholars, and long-term faculty. Members of various departments were recruited to teach part-time in Hum Bio. Professors such as John Adams (psychiatry), Albert Ammerman (genetics), Peter Corning (political science), William Robertson (pediatrics), and Jack Barchas (psychiatry) taught upper-division courses and participated in teaching the core. To acquire and pay for new faculty members, Kennedy used what came to be known as the "rubber-band billet." In this scheme, Hum Bio shared faculty appointments (billets) with traditional departments by receiving the portion of the professor's time to be devoted to undergraduate teaching, while the professor's home department received the graduate training and research portion of the appointment.

STUDENTS AT GOMBE ARE KIDNAPPED

In May 1975, Hum Bio students suddenly became the focus of an international crisis when three Stanford stu-

David Hamburg (second from left) has a happy reunion in 1975 with kidnap victims Carrie Jane Hunter (left), Kenneth Stephen Smith, and Emilie van Zinnicq Bergmann.

dents at Jane Goodall's Gombe Stream Reserve primate-research center in Tanzania were kidnapped by armed rebels from neighboring Zaire (now Congo). Two of the students were senior Hum Bio majors Carrie Jane Hunter and Kenneth Stephen Smith, and the third was Barbara Boardman Smuts, a graduate student in neurological and behavioral sciences. The three students and a fourth hostage, a Dutch researcher named Emilie van Zinnicq Bergmann, were taken across Lake Tanganyika and held at a jungle station in Zaire. The raiders were members of Zaire's dissident group, the People's Revolutionary Party (PRP), waging a guerrilla war against the Zairian government. PRP leader Laurent Kabila eventually took over the Zairian government in 1996 and was assassinated in January 2001. The PRP had perpetrated the kidnapping as a tactic designed to focus global attention on Zaire and gain concessions from Tanzania. A week after the hostages had been seized, Barbara Smuts was released. She carried ransom notes threatening to kill the students if the raiders' demands to the Tanzanian government for a $460,000 ransom, arms and ammunition, and release of PRP members in prison in Tanzania were not met.

Hum Bio founder David Hamburg, who was Stanford's chief liaison with the Gombe facility, immediately traveled to Tanzania and joined an international team negotiating for release of the students. He was assisted by Hum Bio student Michelle Trudeau and others who had also been at Gombe. After two months of anguished suspense and difficult negotiation, the students were all released unharmed. At Stanford, Don Kennedy provided strong support during the kidnapping ordeal and gave the returning students wise guidance as they reentered academic life. After the kidnapping incident, Gombe was deemed too dangerous for students, and the Hum Bio fieldwork program there was not resumed.

AUDREY BERNFIELD COUNSELS STUDENTS

By the mid-1970s, Human Biology had grown to be Stanford's third most populous major, granting 145 bachelor's degrees in 1976. Such rapid growth

Through a course entitled 'The Biosocial Aspects of Cancer' by the great Henry Kaplan, M.D., and an honors project on head and neck cancer, I found my life's work. I have been a radiation oncologist for 17 years. Thanks, Hum Bio! I still have (and use) a copy of research tips by Sandy Dornbusch.

—Sonja L. Schoeppel, class of 1978

Audrey Bernfield holds a counseling session with students.

I went through the core in 1976–77.… I would be amazed at how Dr. Kennedy would give lectures without notes, making complex ideas seem so clear and understandable.… I remember a lecture on the physiology of hibernation by Dr. Heller, maybe because he brought a hibernating gerbil with him that came out of hibernation during his lecture and was running around the table by the time he finished.…

I always felt supported by the Hum Bio program. I even got a hug from Audrey Bernfield after receiving my diploma from Dr. Bernfield in 1980.… Human Biology started me on a path of being a bridge between the front lines of providing health care for the under-served and the decision tables of state and national health policy.

—Ricardo Custodio, class of 1980

strained more than academic resources, and the program suffered growing pains in other ways. Tibby Simon was promoted to program administrator and was able to hire secretary Jan Ruby to assist her. Dolly Ester Madden served as interim administrator in 1974 and 1975 with secretary Talley Kenyon while Simon went on sabbatical. Since 1970, Sophie Alway had served as program coordinator, coordinator of advisors, and career counselor to students, but the job quickly grew too large for one person.

Naturally, since Human Biology was a unique and innovative program, people (especially parents of Hum Bio students) often wondered what a person was prepared to do after graduation with a degree in Human Biology. What careers were open to Hum Bio graduates? The answer turned out to be: anything and everything. As subsequent program director Merton Bernfield observed in his 1980 commencement speech:

> I want to say a word about you now former Human Biology students. You're remarkable in your diversity. There are no stereotypes. There is no typical Hum Bio major.… Let me tell you what I was told when I first asked what one does with a degree in Human Biology: 'Anything you want to do with it' was the answer.

Although many Hum Bio graduates attended medical school or pursued careers in other fields related to human health and health care, graduates entered a wide range of other professions. Environmental policy and law were particularly popular, as well as teaching and business.

With so many career options, Hum Bio students had a special need for career counseling. There were faculty and student advisors in the program, but Kennedy recognized the need for greater guidance. Because Hum Bio was so popular, classes were often large or oversubscribed. Many Hum Bio professors were visiting scholars, or they taught in the program for short periods, always sharing their time with their home departments. This meant that they were scattered around the university and had many demands on their time. Lack of individual guidance and of sustained contact with faculty was a common student complaint.

To rectify this problem, in 1976

Kennedy recruited Audrey Bernfield to serve as Human Biology's head career counselor. A short time later, she also took over supervising the SAs. Bernfield held a master's degree in counseling psychology, and she elevated Hum Bio advising to a new level. To guide students better in structuring their major programs and maximizing their career options, Bernfield worked closely with the SAs and increased the number of faculty advisors from three to fifteen. To follow Hum Bio graduates more closely, she expanded the student records and administered additional student and alumni surveys. Bernfield met with students individually, invited academic and professional speakers to the program, and took students on field trips to various job locations. She helped the students attain goals, advising them, "Don't be afraid of failure. You can learn from it." and "Reach for the stars; then make compromises if you must."

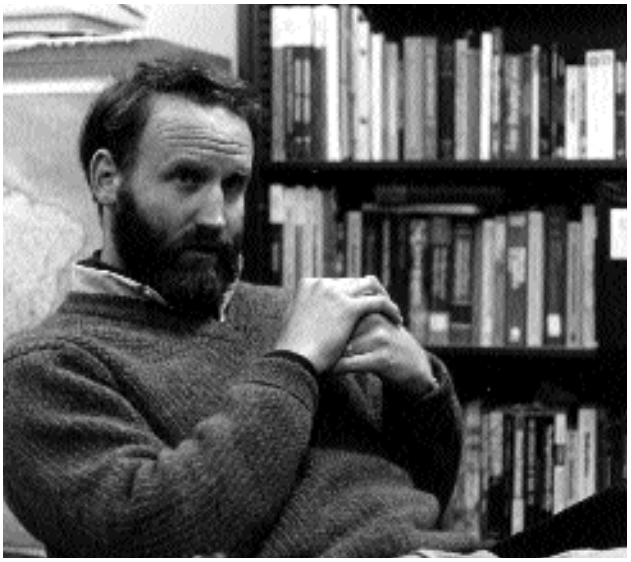
An energetic, outgoing person with great enthusiasm for Human Biology, Bernfield saw herself as a facilitator. "I don't tell people what to do. I help them find their own uniqueness," she said. (*Stanford Daily,* December 2, 1977) Seeking to lessen the pressures from

ALBERT HASTORF

Psychologist Albert Hastorf first chaired Stanford's psychology department and then became dean of humanities and sciences during the time he helped start Human Biology. As the Benjamin Scott Crocker Professor in Human Biology, he taught Hum Bio courses into the 1990s and continues to teach as professor emeritus. In the core B side, he taught social psychology. "Al Hastorf was one of the best lecturers of all, probably because he was such an actor and treated the classroom as his stage," remembers colleague and former student Bill Durham. "He wandered the aisles during lecture, brought in props and film clips, and often acted out his point, even if it meant falling over his own feet." Former Hum Bio faculty member Lorraine Morgan remembers Hastorf's "exceptional ability to look at an amorphous, confusing issue and clarify it, see the significant kernel of truth."

Throughout a long and distinguished career, Hastorf has had a central role in Stanford's development, serving as provost and vice president from 1980 to 1984. Stanford honored Hastorf in 1997 with the Richard W. Lyman Award for faculty volunteer service. He was cited for "the joy he brings to every branch of the Stanford family as its quintessential university citizen and ambassador of good will." (*Stanford Report*, December 10, 1997)

Hastorf's research in psychology has focused on the impact of physical deviancies and disabilities on social interaction and social perception. He is the current director of the Terman Study of the Gifted, a long-term study of the lives of intellectually gifted people started at Stanford by Lewis Terman many years ago. Hastorf has been involved with the study for a long time, becoming its third director in 1987 after the death of director Robert Sears, who had been one of the study's subjects. Sears was also an early Hum Bio faculty participant, interim program director in the 1970s, and friend and mentor to Hastorf.



Bill Durham listens to students during a conference in his office.

Bill Durham's lactose lectures were thrilling! I've stolen elements of them for the psychology classes I teach.

—Dorothy Chin, class of 1985

peers and parents, she encouraged students to define their educational and career goals according to their own interests. She advised students, "The main thing is to major in something you love. Follow it. Pursue it and be challenged. In the long run, you'll be happier." (*Stanford Daily,* January 14, 1985)

WILLIAM DURHAM JOINS FACULTY

In 1977, Kennedy recruited former Hum Bio student William Durham to return as a teacher. Durham was a first-generation Hum Bio graduate who had taken Hum Bio's original class, "Man and Nature," in 1970. As a student, Durham had coordinated the first Hum Bio workshop, in which students procured one of the first and largest federal grants ever given for undergraduate research and used it to study the health effects of air pollution. Durham also had been instrumental in establishing Earth Day and other environmental-awareness programs on campus. As a graduating senior, he was honored with the Dinkelspiel Award for his service to undergraduate education.

In inviting Bill Durham to join Hum Bio's faculty, Kennedy wrote: "We hope you will participate in the core curriculum, primarily through teaching the population biology portion of the 'A' series, but also doing something on sociobiology and perhaps cultural evolution in the 'B' series as well." Durham accepted, began teaching the core and upper-division courses such as "Cultural Ecology," and ever since then has been a guiding force in the program. This remark from a 1979 interview expresses his dedication: "I'm obviously a firm believer in Human Biology at Stanford. There are very few campuses across the world that offer students this kind of day-to-day confrontation between biological explanations for human characters and socio-cultural interpretations." (*Stanford Daily,* July 6, 1979)

In 1977, Don Kennedy was asked to become commissioner of the U.S. Food and Drug Administration, and he accepted. He noted later that in deliberating over whether to accept the job, he thought about his exhortations to Hum Bio students to get involved in matters of public policy, and he realized that he should follow his own advice.

"Don Kennedy was an amazing

director," remembered Robert Siegel, who was a CA during Kennedy's term. "He somehow managed to remember the name of every student in the core." It was difficult to imagine Hum Bio without the charisma and energy of Don Kennedy.

Merton Bernfield Becomes Director

The man chosen to take Kennedy's place was Merton Bernfield, a distinguished researcher in molecular pathology and developmental biology. For over a decade, he had been a key figure at the Stanford Medical Center, serving as chief resident in pediatrics and as head of the medical-scientist training program. Bernfield had participated in the Human Biology Program since its inception, serving as Colin Pittendrigh's head teaching assistant for the "Man and Nature" course, organizing the first Hum Bio discussion sections, and lecturing in the core. He truly possessed the Hum Bio spirit: "I'm only doing this so I can teach … my kicks are not from administrating." (*Stanford Daily,* August 2, 1977)

COURSES ARE REVISED

Even if administration wasn't his passion, Bernfield was an excellent program director. He established new academic rigor and structure in the major, expanding the upper-division course requirements and offerings. He emphasized the goal of offering upper-division courses in coherent themes or "tracks," rather than just a wide variety of individual subjects. In 1978, two new policy courses—one in human-health policy and one in environmental policy—initiated multicourse tracks related to those areas. These courses, at first called "Health and Public Policy" and "Issues in Environmental Policy," were taught by William Lowrance, and Hum Bio majors were required to take at least one of them. Upper-division courses were offered on ethical problems in medicine, biosocial aspects of cancer, recombinant DNA, problems of aging, the world food economy, climate change, international aspects of environmental disruption, and other topics. Local naturalist Herbert Dengler began to teach a course called "Natural History of the Bay Area." In the late 1970s, faculty who became affiliated with Hum Bio included Jeffrey Wine (psychology), Franklin Ebaugh (medicine), and James

Merton Bernfield

Jeffrey Wine

James Fox

Arthur Wolf

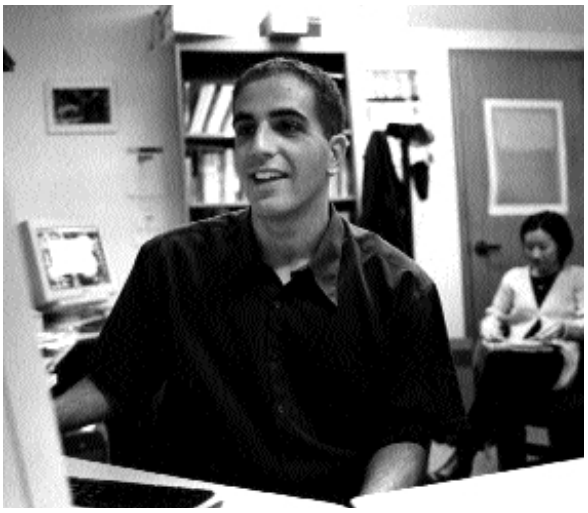
As a doctor doing health-policy research and working as associate medical director of a hospital, I have the ultimate Hum Bio career. I still refer to what I learned in Bill Lowrance's health-policy class, especially our discussions of **Who Shall Live?** *by Victor Fuchs, a book I have used in my own teaching. The interdisciplinary thinking taught in Hum Bio is very powerful and the most effective way to approach problems.… Working as a core CA was a wonderful experience. It was a challenge to keep ahead of the students, who were very sharp and asked tough questions.*

—Dan Lessler, class of 1980

Fox (anthropology).

In the core, units of study called "modules" were initiated, in which both sides of the core focused simultaneously on a particular topic or problem, analyzing it from A- and B-side perspectives. As Kennedy had done, Bernfield also encouraged cooperation among faculty. While he concentrated on coordinating the natural-science portion of the core, anthropologist Arthur Wolf focused on coordinating the social-science portion. Wolf has been instrumental in shaping the social-science side of the core curriculum ever since he joined Hum Bio in 1977 from the anthropology department.

Integrating the biological- and social-science components of the core exemplified the interdisciplinary goal of Human Biology, and it required continuous effort. There were debates over how much to emphasize various disciplines. The social scientists sometimes thought the biologists and chemists relegated the social sciences to the secondary role of simply applying and explaining the social relevance of the natural sciences. It was difficult to create a stable balance. Unless there was cooperation and communication among the core faculty, sequential units of core material presented by different lecturers could lose continuity and become unrelated one-act performances. This put an unfair burden on the CAs to make the connections in their discussion sections.



B-side CA Ramin Shadman and A-side CA Vivian Truong review core student assignments, spring 2001.

As coordinator of the A-side core, Mert Bernfield spent many hours preparing his lectures and working with the CAs, mulling over exam questions, course material, and teaching methods. He worried about his lectures, though, because students sometimes had difficulty following his rapid transitions between topics. To help him slow down, his CAs provided him with a small windup toy that he would set off to walk across the classroom overhead projector screen each time he began a new topic. He welcomed innovative material to help students learn core concepts, such as a movie made by medical student David Sachs that featured students dressed as molecules and dancing in patterns to demonstrate graphically how DNA worked.

Students learn about careers from recent graduates at Beyond Hum Bio, spring 2001.

Mert and Audrey Bernfield, husband and wife, worked as a team devoted to strengthening the program. To create a warm, welcoming atmosphere in Building 80, where the Hum Bio offices, SAs, and CAs were located, they renovated the building and added comfortable sofas to the main meeting room. Occasionally, the couple could be seen sitting side by side in Hum Bio core lectures. The Bernfields actively encouraged the sense of community that developed as Hum Bio majors took the core together sophomore year, planned their workshops and areas of concentration, worked as SAs, served on Hum Bio committees, and sought career and other advice from faculty and staff. Mert Bernfield said he "liked to think of the program as a small college in a big university where people can feel at home." (*Stanford Daily,* December 2, 1977)

Hum Bio's administrative staff was unusually enthusiastic and supportive, serving as important sources of help and advice for students. The staff encouraged students to come to the Hum Bio office and greatly enhanced the community atmosphere that prevailed there. Iris Boudart followed Tibby Simon as program administrator. In 1980, Deana Fabbro-Johnston was hired, and she served as administrator until 1992. Audrey Bernfield continued as director of advising and career planning through the 1980s, expanding both programs. She initiated Experience by Degrees (now called Beyond Hum Bio), an annual symposium organized by the SAs in which alumni share their career experiences with current students.

LORRAINE MORGAN IS HIRED

In 1979, Lorraine Morgan was hired to coordinate Hum Bio's workshops and honors program. For a number of years, she also taught a Hum Bio course on educational policy. Morgan, previously head of the education department at Chatham College, was enthusiastic about Hum Bio's innovative courses, interdisciplinary approach, and the workshop program started by Sidney Liebes. Many students claimed that the practical experience they gained in their workshops was one of the best parts of the Hum Bio major. Morgan expanded the workshop program, changing the

Lorraine Morgan celebrates with students at her retirement party in the Quad in 1993.

I like my job as a medical director for the same reasons I liked the Hum Bio major. The practical, problem-solving approach is well-rounded. Understanding both the social and scientific aspects of a problem is a powerful combination.

—Charlene Polan, class of 1975

In this age of rapid technological advances in medicine, it is easy to overlook the social aspects of people in favor of focusing on technology. My Hum Bio background has helped me to remain aware of this potential oversight in my medical practice.

—Michael Vessey, class of 1978

name to internships and introducing more structure. More comprehensive reporting and evaluation requirements were established, and students were encouraged to relate their internships to their chosen areas of concentration. She involved the SAs more directly in helping students choose appropriate internships.

Morgan also expanded and improved the honors program. Students had pursued honors work in Hum Bio since 1974 through an informal program. Believing that a well-organized honors project was an invaluable learning experience, Morgan set up structured guidelines and encouraged more students to pursue honors research. Students were required to submit honors-research proposals for approval and were given substantial help in focusing their interests on specific research questions, formulating proposals, and finding appropriate faculty thesis advisors. After completing their research and writing their theses, students were required to make formal oral presentations of their honors work.

In 1980, Mert Bernfield's term as director ended as he went on sabbatical to pursue research in perinatal biology. His tenure had strengthened the program and preserved its philosophy. As he remarked on one important aspect of Human Biology in his address to graduating seniors in June 1980:

> We expect students to be able to synthesize their knowledge and extrapolate from it, to be able to see the interrelationships and to look at matters creatively. After all, the real world rarely duplicates textbook examples.
>
> …
>
> Human Biology has sometimes been criticized as being insufficiently rigorous academically.… The goal of an education, in my view, is not to absorb mountains of facts. Clearly, facts must be digested and absorbed, but that is only the beginning. One must know how to think, how to reach into the unknown, how to explore an issue and how to make intellectual inventions. I wouldn't ever trade an education that stressed problem-solving for one that rewarded memorization in the guise of academic rigor.

To answer occasional charges that the Human Biology program was insufficiently rigorous, a study was made of Hum Bio students' grade-point averages,

performance on the medical-school admission test (MCAT), and rate of admission to medical school compared with students in other majors, especially biology. The survey found no differences in grades or test performance, and the same rate of admission to similar medical schools for both Hum Bio and biology majors. These findings put to rest concerns expressed by some that a Hum Bio degree might not be viewed as favorably by medical schools as an undergraduate degree in biology or chemistry.

As its first decade drew to a close, Human Biology remained as popular as ever, awarding 180 degrees in June 1980. Among the 300 undergraduate Hum Bio majors, a survey showed that about 25 percent planned careers in medicine, 7 percent in public health, 10 percent in law, 3 percent in business, and most others in teaching or other areas of public service, indicating that the program continued to attract students with many different career goals.

After returning from his sabbatical, Mert Bernfield continued to lecture in the A-side core. He also taught an upper-division course called "Biological and Policy Aspects of Abnormal Fetal Development." Audrey Bernfield served again as Hum Bio's director of advising and career planning, but in 1985 became director of Stanford's Undergraduate Advising Center, where she developed university-wide programs based on her innovative work in Hum Bio. Lorraine Morgan succeeded her as Hum Bio's director of advising. In 1989, the Bernfields left Stanford and moved east to Harvard University, where they continue their work—Mert in medicine and Audrey in counseling.

I have wonderful memories of Hum Bio, and I am more grateful than words can express for what Stanford and Hum Bio have meant to my life. What I remember most is the warmth and acceptance. What I didn't have the maturity to appreciate at the time … was the incredible talent and excellence of both the staff and students and how the simple proximity to them was enriching me.… I remember outdoor section meetings in the Quad. I remember Don Kennedy suggesting that ultimately all we may be is vessels for our DNA, but actually that's okay.… I appreciate the thought-provoking policy sections and still reflexively ask the same kinds of questions in my professional life today that I learned from them. I am now an emergency physician, and I see the 'biosocial aspects of …' in so many issues of my profession. The unsolvable questions of resource allocation, the debates of medical social policy, the personal questions of when it's time to let our loved ones rest—these are all questions I think about, and I think I'm better for my patients because of it. What Stanford and Hum Bio did for me at a critical juncture in my life was to challenge me, with kindness and encouragement, to a standard of excellence in personal performance and critical thinking that I never would have otherwise encountered. To this day, I'm still not sure I meet that standard.

—Dan Delgado, class of 1978

The Eighties

1980 Richard Thompson becomes director.

1981 Student-led Human Biology Policy Committee and student honors project review Hum Bio.

1985 Craig Heller becomes director.

1986 Adams House becomes the first academic focus house.

1987 Stanford Medical Youth Science Program is started.

1987 Human Biology Middle Grades Curriculum Project begins.

1989 Loma Prieta earthquake damages Building 80.

Richard Thompson Becomes Director

In September 1980, Richard Thompson became director of Human Biology. A distinguished neuroscientist, he was new to Stanford, coming from the University of California at Irvine. As well as directing the Human Biology Program, he joined the faculty as a professor in the psychology department, where he conducted research on the biological basis of behavior. At Irvine and previously at the University of Oregon, he had done extensive interdisciplinary research on the physiological psychology of the brain and how the brain codes, stores, and retrieves memories. In Hum Bio, he taught the A-side of the core and upper-division courses such as the "The Brain and Behavior" and "Psychobiology of Learning."

NEW COURSES AND REQUIREMENTS

Completion of a statistics course became a requirement for the major in 1980. Richard Thompson and the faculty teaching the core continued to reevaluate and revamp its curriculum. Physical science received renewed emphasis, and an upper-division course in physiology was added, as well as more environmental-policy courses. Anne Ehrlich began to teach a course called "Environmental Policy." Margaret Race, a field ecologist with special expertise in marine ecology, joined the program in 1980 and taught "Public Decision Making Regarding the Human Environment," a policy course begun by William Lowrance. Anthropologist John Rick began his long association with Human Biology in 1980 with a course on evolution of prehistoric civilizations. In 1984, biologist Carol Boggs started a course in evolutionary ecology and later began teaching in the core. Eventually, following Lorraine Morgan, Boggs became director of Hum Bio's SAs, who have taken an ever more active role in the program's activities over the years.

Building on Merton Bernfield's emphasis on a rigorous physical-science core curriculum, in 1981 Richard Thompson hired Robert Siegel as lecturer in charge of the core's chemistry seminar. In 1977–78, Siegel had been an influential Hum Bio CA. After his undergraduate training at Stanford, he pursued graduate study in virology, obtaining both M.D. and Ph.D. degrees. While finishing his graduate studies, he ran the core chemistry seminar. He eventually joined the Hum Bio faculty

and has made important contributions over many years of teaching innovative courses such as "Humans and Viruses," "The Vaccine Revolution," and "The Smallest Predator." He now also teaches in the medical school.

An increasing number of faculty taught in the program, and they came from a wide variety of university departments—law, economics, philosophy, the Food Research Institute, geology, communication, and engineering, as well as the medical school. By 1984, the Human Biology Program had forty-five affiliated faculty and offered forty-three upper-division courses, such as "Endocrines and Behavior," "Problems of Aging," "Biology and Evolution of Language," "Advanced Neurochemistry," "Human Nutrition," and "Human Population Genetics." Carl Djerassi added "Feminist Perspectives of Birth Control" and "Pest Control—Technical and Policy Aspects" to his repertoire of Hum Bio classes.

Richard Thompson continued the Hum Bio practice of sponsoring unique, experimental courses and courses given by distinguished visiting faculty. In 1983, visiting professor Robert Ornstein taught "Human Nature: The Human Animal," and, in 1984, David Brower taught "Environmental Solutions: Science, Ethics, and Policy." In a Hum Bio policy course called "The Disabling Society: Psychosocial Aspects of Physical Disability," students created Enable, a computer database of information that was adopted by Stanford's disabled-student services.

Richard Thompson

Since Hum Bio's core courses were innovative and unique, often there were no textbooks available. As part of the physical-sciences portion of the core, Richard Thompson wanted to introduce more material on physiology of the brain and neuroscience while also continuing to emphasize policy issues. He had trouble finding course material, so he created his own textbook by assembling materials from many sources. This core reading and lecture material later was published as a book called *The Brain, A Neuroscience Primer,* now in its third edition.

Anne Ehrlich

Richard Thompson strengthened Hum Bio by actively encouraging the careers of young faculty members. "The thing I remember and appreciate most about Dick Thompson's years at the

Carol Boggs

I won the first annual Firestone Medal for Excellence in Research for my honors thesis, "Ontogeny of Spatial Memory in the Rat." My advisor was Hum Bio director Richard Thompson. I use my Hum Bio education every day in my medical practice.

—Ronald J. Green, class of 1985

helm," noted Bill Durham, who was promoted to tenure during Thompson's directorship, "was his strong support of younger faculty like Margaret Race, Carol Boggs, and me. Dick would go out of his way to encourage our research as well as our teaching. I was invited to an international conference on sickle-cell disease on the strength of his recommendation."

STUDENTS EVALUATE HUM BIO

Human Biology had made its way through the 1970s with great success. As the new decade commenced, students, faculty, and staff took time to reflect upon the program's progress. In 1981, a group of students formed the Human Biology Policy Committee to review the program's strengths and weaknesses. Chaired by student Hank Tung, the committee's monthly meetings were open to all undergraduates and aimed to provide an official channel through which students could voice criticisms and suggest improvements for the program. Director Richard Thompson welcomed it as an "advisor to both Human Biology's executive committee and to myself." The committee tackled long-standing Hum Bio issues such as availability of faculty, course offerings, and cohesiveness of the core.

One undergraduate, Carolyn Kline, wrote her honors thesis on Human Biology's progress. Using data from a comprehensive student survey, Kline wrote "A Preliminary Examination of the Program in Human Biology at Stanford University." Kline's study uncovered key defects of the program, such as insufficient depth and coordination among upper-division courses. It also illuminated Hum Bio's great strengths, such as the "wonderful" faculty and staff, whose enthusiasm, devotion to teaching, and emphasis on relevance of class work to the larger world were appreciated and admired. Kline found that, overall, students were satisfied with their major, especially the core. Among all 138 students who answered the survey, only one was dissatisfied with the core. (Carolyn Kline, 1981)

STUDENT ADVISING

With continuing emphasis on each Hum Bio student devising his/her own area of concentration and internship, the SAs provided valuable guidance to students entering the major. The SAs began to stage the Internship Faire each autumn, in which representatives of local agen-

David Sutton

Lorraine Morgan

cies, organizations, and other entities with internship programs were available to speak with students and answer questions. To help students learn about career options and formulate career goals, the SAs presented informational events with Hum Bio alumni, such as Experience by Degrees, in which alumni spoke informally with students about their careers. A similar SA event, called the Premed Extravaganza, presents alumni with careers specifically in health care.

The active, involved corps of SAs is unique at Stanford and remains an important part of Hum Bio today. Most recently, they started The Buzz, an online source of information about Hum Bio events and deadlines, internship opportunities, and other pertinent Hum Bio news.

In the early 1980s, in response to a need for more individualized tutoring services, the Writing Program and the Learning Assistance Program (LAP) were started. In the Writing Program, a forerunner of a university-wide service, writing assistants taught students how to plan and execute their written work, from short core assignments to honors theses. LAP was a related tutoring program in which students were paired with learning assistants—more advanced students who had previously taken the course being tutored—for help with study and exam skills.

When Audrey Bernfield left Hum Bio in 1985, Lorraine Morgan became director of advising, and David Sutton was appointed internship coordinator. Russell Fernald became director of the SAs after Morgan left in 1993. He was succeeded by Carol Boggs in 1995.

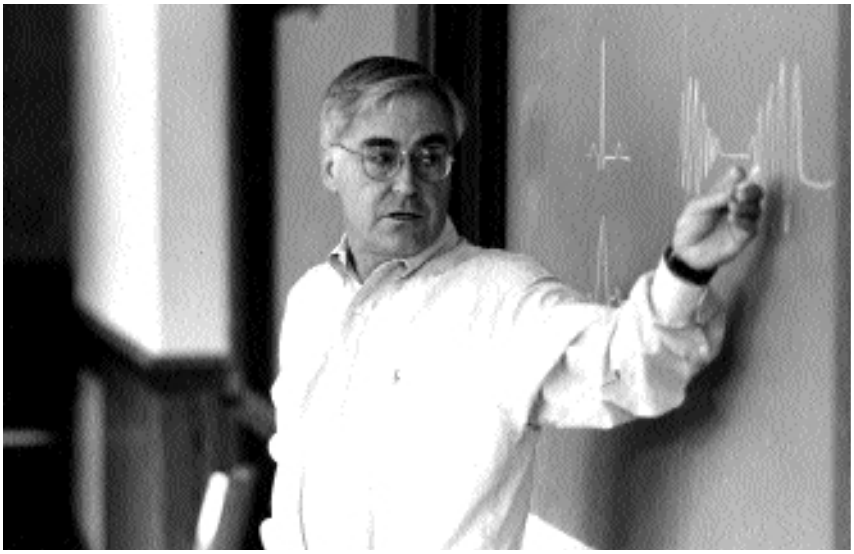
STANFORD REVIEWS HUM BIO

Richard Thompson remained as Hum Bio's director until 1985, when he left Stanford to take a faculty position and continue his research at the University of Southern California. As director, he had maintained high standards for Hum Bio faculty, staff, and students. His term was characterized by stability and harmony. The Hum Bio major curriculum was expanded, and the number of units required for the major was increased.

During the early 1980s, Stanford's Committee on Undergraduate Studies and the academic senate completed a comprehensive review of the program, as they did for all interdepartmental programs at the university. Such reviews were done, usually every five years, to determine whether the programs were

Working in the pharmaceutical industry, I see similarities to the Hum Bio core. There's constant tension between scientific advancement and societal needs, between medicine and business. Hum Bio laid the conceptual framework for understanding these forces.

—Rachel Felt Tasch, class of 1987



Craig Heller teaches "The Human Organism," spring 2001.

I liked that Hum Bio was based on the idea of studying humans in a holistic or interdisciplinary fashion. I also liked being able to design my own course of study. I was inspired to learn and teach by Bill Durham, John Rick, Don Johanson, Robert Sapolsky, and Craig Heller, whose passion for teaching and love of their work were contagious. I had a great internship research experience one summer studying Belding's ground squirrels in Inyo National Park. This solidified my desire to study animal behavior and its evolutionary significance.

My Hum Bio teachers ignited in me a desire to help people understand what it is to be human in terms of our biology and evolutionary past. Now, having taught Hum Bio and anthropological-sciences courses at Stanford since 1998, I try to do this by teaching people about primates and evolutionary theory—showing students how we fit into the 'big picture' of life on this planet.

—Anne Nacey Maggioncalda, class of 1987

fulfilling their purposes and maintaining high academic standards, and thus should be authorized to continue to grant degrees. This formal university review of Human Biology was very favorable, finding the program to be successful and extending its mandate, thus ensuring university support for another five years.

However, the committee's report highlighted a serious problem faced by Human Biology, stating "while the program continues to meet the needs in undergraduate education for which it was designed by several distinguished professors, the number of students majoring in Human Biology and the number and variety of courses that the program currently undertakes to generate have far outstripped the resources in terms of faculty and funds that are available to the program." (*Campus Report,* April 13, 1983) In 1989, a subsequent review reached similar conclusions. Throughout the 1980s, Human Biology continued to attract hundreds of students each year and by 1985 was second only to economics in number of majors.

Craig Heller Becomes Director

Craig Heller became the director of Human Biology in 1985. A professor of biological sciences, Heller was widely known for his research on the neurobiology of hibernation, sleep, and circadian rhythms. He was a fine teacher whose dedication had been recognized with Stanford's Gores Award for Excellence in Teaching. Under Heller's dynamic direction, Human Biology developed new sources of funding and expanded its internship and honors programs. As well, it reached into Stanford dorm life, into the low-income communities of California, and into middle-school classrooms across the nation.

URO FUNDING FOR HONORS PROGRAM

Upon becoming director, Craig Heller instigated a major expansion of Hum Bio's honors program. While serving on a committee for Stanford's Centennial Campaign, Heller and others generated an idea for a competitive grant system that would provide funding for undergraduate honors projects. At that time,

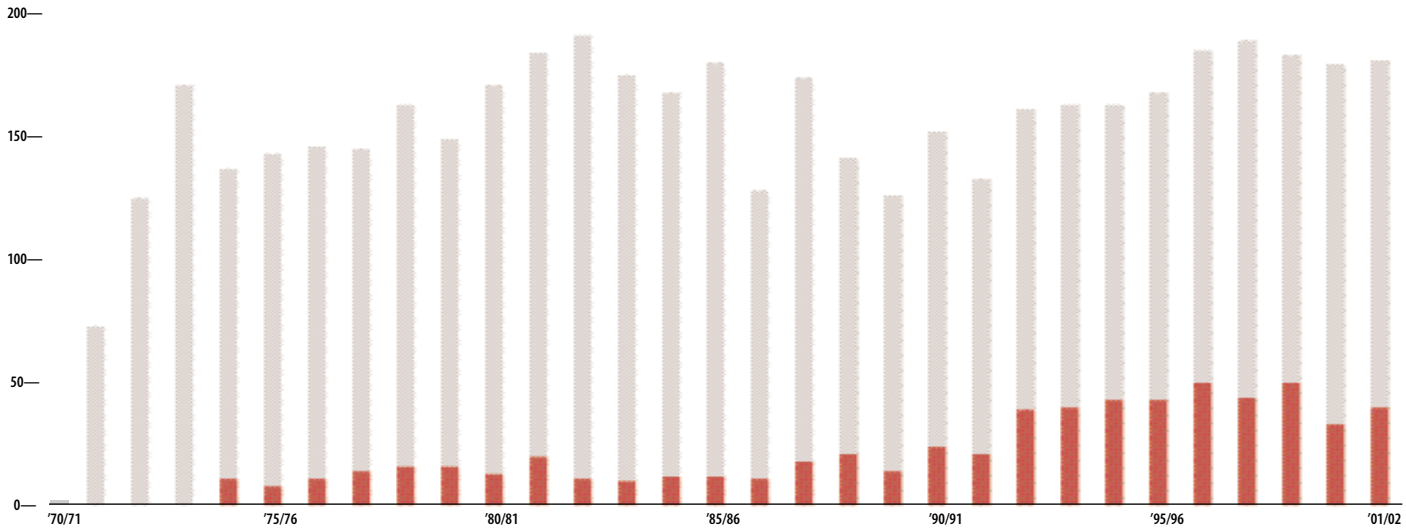
My Human Biology honors project was one of the most rewarding experiences of my college career. My research with drugs in a psychopharmacology lab at the Palo Alto Veterans' Administration hospital led me to propose a means of treating schizophrenia without the danger of inducing Parkinson's disease. There is no doubt that I learned more from my research than I ever did in the classroom. While still an undergraduate, I became an expert in a specific area of biomedical research; I was able to talk as an equal with fellow researchers and doctors.

—Seth Glick, class of 1986

Stanford's Undergraduate Research Opportunities (URO) program served as a valuable resource for finding research opportunities, but did not provide students with any funding. This lack of financial support often severely restricted the scope of honors research projects. Heller's committee managed to procure funding to be administered by the URO office so grants could be made available to undergraduates interested in research. The initial funding came from a gift from the Firestone family, and subsequent support came from the Howard Hughes Foundation and private donations. Since 1985, the URO program has provided research opportunities for thousands of undergraduate honors projects, many of them in Human Biology. Currently, the URO offices fund approximately 450 research projects every year, totaling over $500,000 in research support for students.

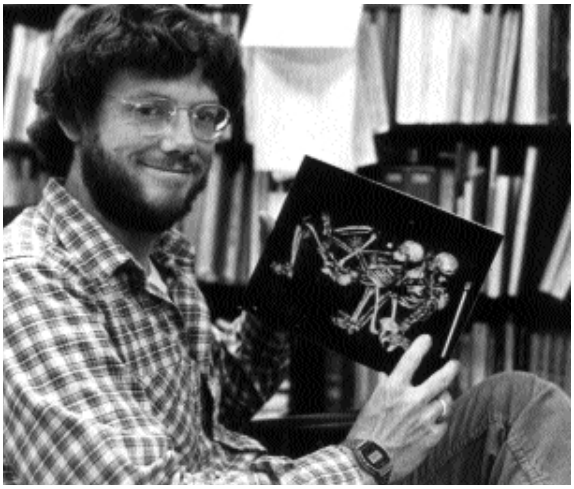
Along with funding opportunities, Hum Bio began a tradition of hosting an undergraduate honors symposium each year. Near the end of the year, when each honors student gives a presentation of his/her project and reports on the findings, all other interested students and faculty are invited. The event is usually capped by a banquet that

Human Biology Graduates (indicated in gray) and Honors Graduates (indicated in red)



In 1998, I was a teaching assistant for Dr. Hurlbut's bioethics class. The challenge of helping other students learn was a highlight and started my love for teaching.
—Ingrid Hemela Morris, class of 1998

both salutes the seniors and thanks their honors-research faculty mentors.


John Rick

HUMAN BIOLOGY FOCUS HOUSE

In 1986, the Human Biology SAs decided to bridge the gap between classroom and dorm life. They formed a committee and submitted a proposal to the Residential Education Program for a Human Studies theme house associated with the Human Biology Program. The goal was a residence community that would provide interdisciplinary educational programs focusing on the human organism and serve as a center for Human Biology studies and intellectual discourse.

Instead of a theme house, however, Adams House in Sterling Quad became the first academic focus house on campus. The Human Biology Focus House had the same goal the committee had articulated for a theme house: to provide a comfortable setting in which students, faculty, and visitors could gather, hold discussions, and present programs on topics related to Human Biology. Lorraine Morgan, coordinator of Hum Bio's internships and honors program, became the first resident fellow of the house and provided informal advising to Adams residents. Later, Hum Bio professor John Rick was the Adams resident fellow. Dorm-based classes in writing and speaking were made available to residents. Human Biology teaching assistants, writing assistants, and SAs held regular office hours at Adams House. Programs like the Adams Alumni Embassy brought together Hum Bio students and recent graduates who could offer the students advice.

Over time, Adams House became a gathering place for Hum Bio students, faculty, and alumni. Its focus on activities related to Human Biology was informal. Though attendance at the programs and other academic activities there was optional, students found the programs valuable and participated in them. As one 1987 Adams resident observed, "I've been exposed to things that I probably wouldn't have seen otherwise. The programs I have gone to have been enlightening, and looking back on it, I wish I had gone to more." Adams brought students together and introduced them to the excitement of

Human Biology and fun-loving Hum Bio majors. "We thought there were going to be a bunch of bookwormy premeds, but it's not like that at all," declared one contented resident after living at Adams for a few months.

The location of the Hum Bio focus house was moved to Yost House in 1998 under the sponsorship of Hum Bio faculty member Armin Rosencranz. Yost continues to provide interesting programs and serve as a forum for intellectual exchange among students, faculty, visiting lecturers, and alumni.

STANFORD MEDICAL YOUTH SCIENCE PROGRAM

In 1987, Human Biology undergraduates Michael McCullough and Mark Lawrence did something wonderful for California's youth. The two students were struck by the economic disparity between the neighboring communities of Palo Alto and East Palo Alto: one of the nation's most affluent towns was located next to a destitute and crime-ridden one. Just across the highway from Stanford lived bright and talented youth who never saw Stanford or any college campus, simply because the opportunities were not available to them.

In response to this situation, McCullough and Lawrence teamed with medical-school senior research scientist and epidemiologist Marilyn A. Winkleby to create the Stanford Medical Youth Science Program (SMYSP). The goal of SMYSP is to expose gifted high-school students from California's low-income communities to hospital and research environments and to encourage them to pursue careers in health care. A related goal is to encourage appropriate representation of our ethnically diverse society in health-care professions and increase the number of health-care professionals who understand the needs of low-income and minority populations.

Each year, beginning in 1988, about twenty students have been selected from a pool of some three hundred applicants to participate in the program. The students come to Stanford for five weeks of the summer, where they live in a university dorm, take classes from faculty, go on field trips to scientific facilities, and work alongside physicians in hospital operating rooms and clinics.

Today, SMYSP continues to inspire California's low-income youth to attend college and pursue their professional dreams. Program participants have come from twenty different ethnic backgrounds. In SMYSP's thirteen-year his-

Armin Rosencranz

Hum Bio has been an excellent preparation for my career as an internal-medicine physician. The well-balanced approach—including psychology and sociology, not just biology—in a premed curriculum helped start me off right to be a well-rounded physician, relating to all aspects of my patients' illnesses.

—Lisa A. Hudson, class of 1984

Hum Bio provided me with a great background for a career as a health-policy analyst. The information I learned about the health-care field—concerns about cost containment and quality of care, the relationship between physicians and hospital administration, pricing of health-care services—has come to life.
—Robin Mackenroth, class of 1987

tory, 99 percent of its graduates have gone on to college, and not one has dropped out. About 80 percent pursue careers in health care. Like program founders McCullough and Lawrence, many of SMYSP's directors and staff are Hum Bio majors.

HUMAN BIOLOGY MIDDLE GRADES CURRICULUM PROJECT

During the early 1980s, national studies revealed that many middle-school students were not learning well and hated school, especially the seemingly irrelevant content of their science classes. Many adolescents were completely uninterested in science by the time they reached high school. Hum Bio founder David Hamburg, by then president of Carnegie Corporation of New York, was especially concerned about this situation and the problem of increasing numbers of adolescents engaging in high-risk behaviors (e.g., drinking, smoking, using illegal drugs, and engaging in early sexual activity) that led to school failure, teen pregnancy, family disruptions, and health problems such as sexually transmitted diseases. In many cases, students had good reason for their lack of interest: the watered-down, vocabulary-laden biology courses typical of middle-grade science at that time were often boring and irrelevant. Hamburg believed that a rigorous middle-grades life-science curriculum focused on human biology, and, where possible, on the adolescent, would not only improve the science taught at this level but through its relevance would capture the interest of this age group. It would enable students to apply their knowledge of biology to the health, social, and behavioral challenges they faced as young teens.

Students in a sixth-grade science class perform a DNA spooling experiment as part of the Human Biology Middle Grades Curriculum unit on genetics.

Coincidentally, at this time, Hum Bio's executive committee was discussing the fact that, although the Human Biology Program was very successful at Stanford, and other universities were interested in copying it (especially the core), a human biology program had succeeded only in a few other university settings, such as Oxford's Human Sciences Program. The committee wanted to make a series of videos of the core for use by other educators or as

a means of updating and exciting secondary-school teachers. In trying to find funding for the video project, Craig Heller approached Hamburg at Carnegie Corporation. To Heller's surprise, Hamburg instead suggested that the Hum Bio faculty develop a life-science curriculum for middle-grade students based on the Hum Bio core. At first, Heller and his Hum Bio colleagues were skeptical, but they agreed to do a short feasibility study. This was so successful that Hum Bio faculty became interested and took on the entire long-term middle-grades curriculum-development project suggested by Hamburg.

The early phase of the Middle Grades Curriculum Project (1987–1990) was funded by Carnegie Corporation. In 1990, Craig Heller obtained a $2.7 million grant from the National Science Foundation to further develop and field test the proposed curriculum. In a true interdisciplinary approach, the project brought together faculty, staff, and students from Hum Bio, the School of Education, Carnegie Corporation, and local middle schools. Hum Bio faculty designed an outline and wrote curriculum units based on the Hum Bio core. Craig Heller, Herant Katchadourian, Shirley Feldman, Ellen Porzig, Patricia Jones, Rob Blair, Lorraine Morgan, James Lawry, and many other Hum Bio faculty and students worked on developing the course materials. Mary Kiely, a program director from Carnegie, joined Hum Bio and the School of Education to become the project director.

The Stanford group recruited local science teachers who became full partners in the project. Jerri Horsma, Stan Ogren, Marjorie Gray, and Modell Anderson helped the Stanford group understand the unique problems and opportunities that existed at the middle-grades level. They edited materials, designed and wrote hands-on activities, prepared teacher's guides, visited test sites, and presented the Middle Grades Curriculum materials at national professional meetings. The project drew heavily on Hum Bio students as project assistants. They ensured that the Middle Grades Curriculum retained the spirit of Hum Bio.

The project's mission was to create a way to interest many diverse students in science and give them a solid knowledge base. Craig Heller wanted the new curriculum "to make science not only available, but to demonstrate that it is not an elitist activity, that women and minority students can do it, enjoy it,

I worked as head B-side core CA because I love teaching. I wanted to dedicate myself to thinking about teaching techniques and strategies for synthesizing disparate topics, I appreciated the opportunity to work with such talented and thoughtful people, and I fully enjoyed the challenge of making the material relevant for the broad range of students in the core.… I also worked on the Middle Grades Curriculum Project, which was very innovative and exciting, as we had to reflect upon the values and highlights of the core and translate them into hands-on activities and accessible texts. It was truly rewarding to think about pedagogical approaches and the unique qualities of Hum Bio while working with an interdisciplinary group of innovators. Lorraine Morgan was an inspiration to work for; she galvanized a team of diverse individuals.… Herant Katchadourian, my honors-thesis advisor, has been an inspiring and generous mentor.… I just finished a Ph.D. in art history, and my dissertation investigates the intersection between medical imagery and contemporary art, so much of the knowledge I gained in Hum Bio was eventually put to use in art history!

—Elizabeth Dungan, class of 1988

A big part of why I went to Stanford was Hum Bio. I had my whole area of concentration planned before I started the core. Fall of sophomore year, I went to the SAs and laid out my plan to study the neuropsychological basis of behavior. I thought I knew it all. The SAs kindly encouraged me to wait to complete the core before deciding on my area of concentration. The summer after the core, I worked in an emergency room and saw lots of AIDS patients. Simultaneously, more information came out about HIV in India. I started to think about combining my new interest in public health with my desire to do medical work in India.

Junior year, I took two courses that changed the focus of my career—"Medical Anthropology" and "The Impact of AIDS"—and found that my heart really lies in anthropology and international health, not in neuropsychology. I ended up going to India the summer after my junior year and completing an honors thesis exploring the knowledge and attitudes of Indian college students about HIV and AIDS. Now, as a fourth-year medical student, my passion lies in HIV/AIDS and international health. I have done medical work in Haiti, India, and Zimbabwe. I hope to pursue a career that combines clinical work and public health.

—Seema Jain, class of 1994

and become successful at it." Each course unit provides a foundation in the life and/or behavioral sciences and applies this knowledge to health, social, or environmental issues. To ensure that the curriculum would appeal to a wide range of students, innovative materials were created for teaching students with limited proficiency in English and students with learning disabilities. A supplementary grant of $700,000 was received in 1991 from the National Institutes of Health to develop videos and other multimedia teaching aids for classroom use and teacher training.

From 1991 to 1994, the Middle Grades Project worked with twelve diverse test-site middle schools across the United States. Teachers and administrators from these schools came to annual two-week summer institutes at Stanford. Test-site schools were linked electronically to each other through a Hum Bio project network to allow collaboration among teachers and students at different sites. The Human Biology Middle Grades Curriculum was completed as twenty-two units, or study modules, and published in 1998 by Everyday Learning Corporation.

EVOLUTION OF HUM BIO

In the 1970s and early 1980s, courses and areas of concentration in environmental studies were a priority with Hum Bio students. In the 1980s and 1990s, health-care and medical issues increasingly became centers of attention. New courses reflected these trends.

Human Biology took a leading role at Stanford in focusing attention on the AIDS crisis. Courses about the AIDS epidemic were started by virologist Bob Siegel, who had recently begun to teach his course "Humans and Viruses." In 1985, six Hum Bio students were given the Dean's Award for Distinguished Service to the University in recognition of their having organized a four-day symposium called "The AIDS Challenge: The Costs of Not Caring." In 1988, Herant Katchadourian and medical student Sylvia Cerel taught "Biosocial Aspects of Sexually Transmitted Diseases." Hum Bio sponsored a series of lectures that examined the mass media's coverage of AIDS issues. Craig Heller coordinated a course called "The Great Neglected Diseases of Mankind."

In the mid-1980s, anthropologist Clifford Barnett joined the Hum Bio faculty to teach "Aging: From Biology to Social Policy," ophthalmologist

Clifford Barnett

Michael Marmor began to teach "Eye and Implications of Vision," and science historian Timothy Lenoir taught history of science and medicine. In 1990, William Dement, a professor of psychiatry, brought his popular course "Sleep and Dreams" into the Hum Bio curriculum, and Frank Stockdale, also from the medical school, taught in the core. Biologist Robert Sapolsky began to teach courses on human behavioral biology.

Advances in genetics and medicine gave rise to many complex ethical issues and dilemmas. Stanford medical-school alumnus William Hurlbut began teaching biomedical ethics in 1990 in Stanford's Undergraduate Specials Program. When funding stopped two years later, Hurlbut was hired by Hum Bio to continue his innovative course "Adam 2000." The course was later expanded into "Bioethical Issues in Human Biology," a popular yearlong series of classes that parallels the core.

In the 1990s, an upper-division course track in environmental policy was organized by Bill Durham and attorney Armin Rosencranz. An expanded health-policy track was formulated by Donald Barr, another new member of the Hum Bio faculty who is both a sociologist and a medical doctor. Stanford medical-school professor Gordon Matheson and nutrition researcher Gail Butterfield coordinated courses on health, nutrition, and human performance.

A crisis occurred in October 1989, when the Loma Prieta earthquake rendered the Hum Bio office in Building 80 uninhabitable. Program administrator Deana Fabbro-Johnston and secretary Stacey Campbell ran the office "out of a closet and a small alcove" in Building 110. After several weeks, the office moved back to Building 80, but large cracks and temporary bracing remained until the building was finally renovated in 1993.

Funds have always been tight for Hum Bio, and each director has had to struggle to accomplish the goals of the program on a limited budget. Craig Heller worked very hard to raise money to hire faculty, support student projects, and bring visiting scholars to teach in the program. In 1990, as part of Stanford's Centennial fundraising and Hum Bio's twentieth anniversary, the Alumni Innovation Campaign sought contributions from Hum Bio alumni. To give the campaign a vigorous start, philanthro-

William Dement

Robert Sapolsky

Gail Butterfield

Bill Hurlbut teaches "Bioethical Issues in Human Biology," spring 2001.

During winter quarter of my senior year, I was encouraged to enroll in "Adam 2000: Images of Human Life in the Age of Biomedical Technology," taught by my faculty advisor William Hurlbut. Using an interdisciplinary approach to the social, moral, and aesthetic values governing the use of biomedical technology, the class focused on how advances in biology were reshaping our relationship with nature, attitudes toward our own bodies, and ideas about the meaning and purpose of life. One entire lecture focused on the notion of beauty. We were forced to confront our own prejudices and impressions of beauty in a materialistic age.… One week after graduating from Stanford, I was crowned as the first Asian American Miss California in the eighty-year history of the pageant. Three months later, I found myself on the stage of Miss America in front of millions of viewers, finishing as second runner-up and garnering the top academic and talent awards. When asked the onstage interview question relating to genetic prenatal testing, I responded by citing A Brave New World, *a novel we had fittingly studied in Professor Hurlbut's course.*

—Rita Ng, class of 2000

pists Lorry and Eva Lokey donated $25,000, which the campaign subsequently matched with alumni contributions.

After a record six years, Craig Heller concluded his term as Human Biology director. His contributions to Hum Bio were invaluable, among them the Middle School Science Curriculum, expansion of honors through URO funding, and his support of students who started the Hum Bio focus house and SMYSP. Since stepping down as director in 1992, Heller has continued to teach and coordinate the 4A (spring) portion of the core with Russ Fernald. As a teacher, Heller has a special ability to explain complex phenomena, like fluctuating blood volumes and pressures in the heart chambers, and distill them into examples of fundamental scientific principles. He serves as an example of his belief in the paramount value of good teaching. As he remarked in explaining the reasons for Hum Bio's success in attracting students over the years:

> One reason is that the sole purpose of the program is undergraduate education, so it strives for excellence in teaching and has built a reputation for exciting, well-taught, rigorous courses. Another reason is the creative flexibility it

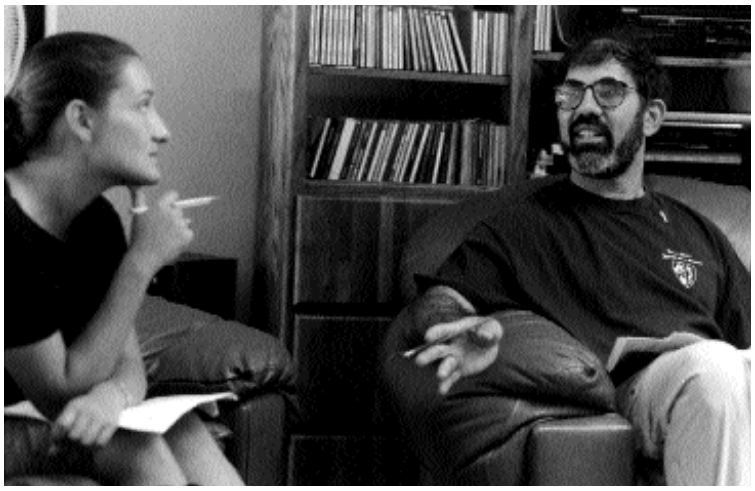
offers students in the design of their individual programs of study. With an excellent system of peer and faculty advisors, it has been possible to maintain the rigor essential for preprofessional training while enabling the creation of very innovative combinations of coursework, experimental education, and research.

In 1997, Craig Heller became chair of the Department of Biological Sciences.

I majored in Hum Bio to study environmental science, but I eventually became a physician. Audrey Bernfield encouraged me and convinced me I could do anything; Mert Bernfield and Roland Ciaranello taught me how to survive along the way.… The interdisciplinary nature of Hum Bio made it great. My work now doing research on alcoholism prevention builds directly on Hum Bio principles: it is cross-disciplinary.… Majoring in Hum Bio was a lot of fun. You got to fashion the courses of your major around a question or issue that really interested you. This is really the structure of research and academic inquiry.

Hum Bio was unique in that recent grads got to teach as CAs. My year as head A-side core CA was a fantastic learning experience. Mert Bernfield's lectures on cell biology, Bill Durham's lectures on how the birth interval affects population, debates between Bill Durham and Art Wolf on the incest taboo, and geneticist Elizabeth Short using her cats' "family tree" to illustrate the effects of inbreeding were just a few of many memorable parts of the core for me.

—Kathy Bradley, class of 1982



Bob Siegel teaches a seminar called "The Vaccine Revolution," spring 2001.

The Nineties and the New Century

1992 William Durham becomes director.

1993 Ellen Porzig starts to direct the honors program; Summer Honors College is established.

1994 Hum Bio Field Seminars begin.

1994 The Stanford Youth Environmental Science Program begins.

1995 Lorry I. Lokey endows two professorships in Human Biology.

1995 The Bingham Award for Student Innovation is established.

1995 Russell Fernald becomes director.

1998 The Beagle II Award for Summer of Exploration is established.

1998 Hum Bio and the Stanford Learning Lab start web-based problem sets in the core.

William Durham Becomes Director

In 1992, William Durham, who had been teaching in Hum Bio and the anthropology department since 1977, became Hum Bio's director. He had an impressive record of teaching and scholarship: in 1983, he had received both Stanford's Gores Award for Excellence in Teaching and a MacArthur Prize fellowship for his research in human biology and anthropology. Professor Robert Siegel remarked that "It was like the program was coming full circle, because their prized student had returned to lead the department." Durham, a "consummate human biologist," brought new energy and innovation to the program.

FACULTY OFFICES MOVE TO BUILDING 80

One of the first things Bill Durham did was improve the program's physical facilities and reorganize the staff. The former challenge was formidable—how to expand the space allocated to a program that had barely enough funding to sustain day-to-day operations. Fortuitously, the 1989 Loma Prieta earthquake became a blessing in disguise when engineers determined that the Quad required "seismic strengthening." With luck and persistence, Durham encouraged Stanford not only to make Building 80 a "test site" for seismic strengthening, but also to completely redesign it. The geology labs on the first floor and tiny "booths" for SAs in the Hum Bio office were demolished. Working with architects and the construction company, Durham and Maria Drueckhammer—Hum Bio's dedicated new program administrator—almost doubled the program's usable space. Offices for Hum Bio faculty were installed in Building 80, for the first time augmenting the staff, SA, and CA offices. In addition, the seminar room was expanded and a new classroom for Hum Bio sections was added. As part of the same seismic strengthening, the main Hum Bio lecture hall, Geology Corner 320, was also completely rebuilt.

Relocating faculty offices made Building 80 a stronger center for the program and facilitated spontaneous intellectual debate and communication among students and teachers. Previously, faculty had been scattered among different buildings and departments. Clustering the new offices in Building 80 strengthened Hum Bio's sense of community.

Bill Durham advises a student, spring 2001.

THE CORE IS REVISED

In a major change, the core courses were increased from four units to five and began to meet four days each week instead of three. New topics and more material in social sciences such as anthropology and economics were added. This meant that the core became an even bigger part of the sophomore Hum Bio student's life and made extra demands on core faculty and CAs as well.

The CAs were an indispensable asset to the core, but they were perennially overworked and underpaid. Durham was able to ease this situation by increasing their number and the hours for which they were paid, and by upgrading their job classification. These improvements strengthened the CA group, thereby enhancing the core. As faculty members acknowledge, students do much of their learning in the core sections taught by the CAs. In contrast to traditional departments, where all graduate students are required to teach whether they want to or not, the Hum Bio CAs voluntarily apply for their jobs and are selected partially for their interest in teaching the core to undergraduates. As new Hum Bio alumni, they are in close touch with the student experience and bring a valuable perspective to the core. As well, they serve as inspirational mentors to current Hum Bio undergraduates.

Bill Durham was a dedicated practitioner of Hum Bio's interdisciplinary approach and sought to emphasize it in the core by expanding the modules. Even in graduate school in ecology and evolutionary biology at the University of Michigan, he had created his own interdisciplinary specialty, calling it human ecology. In the modules, scheduled occasionally each quarter, the biological and social-science concepts and methods that had just been taught were focused on a complex phenomenon or problem. The modules were powerful educational tools, meant to demonstrate how to use knowledge and to encourage students to question assumptions and think analytically. Some of the modules became famous Hum Bio core classics, such as the modules that examined lactose intolerance, the incest taboo, worldwide hunger, or the speciation of Lake Victoria's cichlid fish population.

In the mid-1990s, the Hum Bio roster

The years I spent working in Hum Bio were the most satisfying of my career in academic administration. What struck me right away was the depth of caring and dedication exhibited by the faculty and teaching staff. It was a loving, challenging family atmosphere.… Hum Bio executive-committee meetings were always lively. Al Hastorf and Don Kennedy impressed me with their insights. Carl Djerassi had a knack for making the discussions lively. Ellen Porzig, Bob Siegel, and Herant Katchadourian awed me with their dedication. Bill Durham and Russ Fernald—though opposites in management style—were both a delight to work with.

… There were fights with the dean's office over pay for the core CAs, yearly battles over the budget and teaching-assistant allocations, and surprised looks from the finance staff when I ended each year ever so slightly under budget.

—Maria Drueckhammer, Hum Bio

Hum Bio gave me a chance to combine many interests and fields into a major that was not possible in any other specific discipline. I didn't want to spend much time in required classes unrelated to my areas of interest; I knew I wanted the tools to work on behalf of children; I knew I wanted to combine my interests in science and education with my strong writing skills. Hum Bio fulfilled all those goals for me. My area of concentration was education and society. I was interested in a broad view of how education fits into society.… I have been teaching 8th grade science in the Bronx through Teach for America.… Because I am teaching science, things I learned in the core are definitely coming in handy. I never realized how much I actually learned about the human body, as I was always more focused on the B-side, fuzzy, social-sciences aspects of Hum Bio. But when my kids ask questions about how nerves pass on messages, I can think back to the core for my answers.

—Kelly Vaughan, class of 2000

Ellen Porzig

of affiliated faculty who taught upper-division courses continued to expand. Anthropologists Richard Klein and Joanna Mountain joined Hum Bio. New courses were added that focused on women's issues, such as "Women, Sexuality, and Health" and an introductory course on women's health research. Examples of new courses in other areas were "Indigenous Peoples and Environmental Problems," "Human Evolutionary Genetics," "The Vaccine Revolution," "Ethnogerontology," and "Neural Basis of Sleep and Circadian Rhythms." The formerly required policy course (Hum Bio 40 or 41) was no longer offered; instead, students could choose among a number of policy courses.

SUMMER HONORS COLLEGE

The honors program had always been strong in Human Biology, with at least 10 percent of majors doing honors research. Ellen Porzig, who taught "Vertebrate Biology" in Hum Bio, began directing the honors program in 1993, following Lorraine Morgan. During the 1990s, under Porzig's leadership, the honors program began to attract even more students. Honors research was facilitated by Summer Honors College and financed by URO and other grants. Today, more than 25 percent of Hum Bio majors complete honors theses.

To enhance the honors program, Bill Durham and Ellen Porzig initiated the Human Biology Summer Honors College, a three-week summer program for students planning to write honors theses. Senior year was so rushed and congested with deadlines and requirements that students often felt swamped trying to complete an entire honors project in nine months. The Hum Bio Honors College alleviated this problem by giving students early training in research skills and a head start on their projects. Students learned how to develop a thesis, use research tools such as statistical software, and deliver effective oral and written presentations. Faculty members supervised Honors College, serving as mentors and advisors for the student participants. Human Biology was the first department to propose and fund an honors college, but it was so beneficial that other departments and programs, following Hum Bio's lead, now also hold honors colleges for their majors.

FIELD SEMINARS

In 1994, Durham introduced another kind of hands-on learning experience for Hum Bio majors. In collaboration

with philanthropists Peter and Helen Bing, he started the Human Biology Field Seminar, a travel/study program cosponsored by the Stanford Alumni Association and Continuing Studies that brings together undergraduates and alumni for extended coursework and field experience in locations such as the Galápagos Islands, Costa Rica, or the Peruvian Amazon. For students, a field expedition is the culmination of a seminar course taken the previous quarter. For alumni, the trips follow a Continuing Studies seminar. The Galápagos Field Seminar, for example, gives students and alumni an opportunity to retrace the footsteps of Charles Darwin. They observe the finches, giant tortoises, iguanas, and other creatures seen nowhere else in the world, and they witness the survival problems facing Galápagos species today. Funding from the Bings makes scholarships available to students who otherwise would not be able to participate in the expeditions. Since 1994, scores of students and alumni have attended Field Seminars led by Bill Durham and Hum Bio professors John Rick and Clifford Barnett.

STANFORD YOUTH ENVIRONMENTAL SCIENCE PROGRAM

The Stanford Medical Youth Science Program started in 1987 by Hum Bio student

Participants pause while on a Galápagos Field Seminar expedition, June 1997.

FIELD SEMINARS

1994 Galápagos Field Seminar (Bill Durham)
1995 Costa Rica Field Seminar (Bill Durham)
1996 Peru Field Seminar (John Rick)
1996 Amazon Field Seminar, Northeastern Peru (Bill Durham)
1997 Galápagos Field Seminar (Bill Durham)
1998 American Southwest Field Seminar (John Rick & Cliff Barnett)
1999 Amazon Field Seminar, Southeastern Peru (Bill Durham)
2000 Galápagos Field Seminar (Bill Durham)
2001 Amazon Field Seminar, Southeastern Peru (Bill Durham)
2002 Maya Field Seminar (James Fox)

Hum Bio broadened my world by inspiring me to consider questions from the perspectives of a broad range of disciplines. In my honors thesis, I explored the health challenges faced by Russian street children. I hoped to generate recommendations that nonprofit organizations and the Russian government could use to provide better health care to street children. Training in Hum Bio made me realize that to accomplish my goal, I would have to study topics as diverse as virus structure, epidemiology, the history and politics of Russia, and street children's perceptions of health care and authority.

Hum Bio faculty members were always a source of ideas and advice. Bill Durham's energetic lectures on lactose intolerance, the incest taboo, and evolution, and John Rick's descriptions of stone tools and Easter Island statues convinced me to become a Hum Bio major.… I traveled to the Galápagos Islands as part of a field seminar. This experience was unique. I have never been so fully and unforgettably immersed in the material for a class.

Every day in my science classroom, I use the philosophies and information I gathered in Hum Bio. My students learn about evolution from my slides of the Galápagos. I use my research on street children to discuss how to develop a controlled scientific study. I try to recreate my interdisciplinary experience in Hum Bio for students by asking them to understand connections between science, philosophy, and technology.

—Jhumki Basu, class of 1998

William Hurlbut, Armin Rosencranz, Baruch Blumberg, Carl Djerassi, and Shirley Feldman

I wanted to major in Human Biology so I could study both biological and social sciences. In the future, I would like to wear the hats of both a physician and an advocate to best serve the health needs of low-income populations. My internship was at the National Health Law Program, where I studied the factors behind problems in obtaining dental care for poor children. This experience was extremely valuable and has given me the foundation for future work in health-care policy. My honors thesis was titled 'Epidemic of Poor Oral Health in California's Children: A Problem of Barriers to Access to Dental Care.' I was awarded the first Edith and Norman Abrams Fellowship for the research project.

—Sameena Shaheen Beguwala, class of 2001

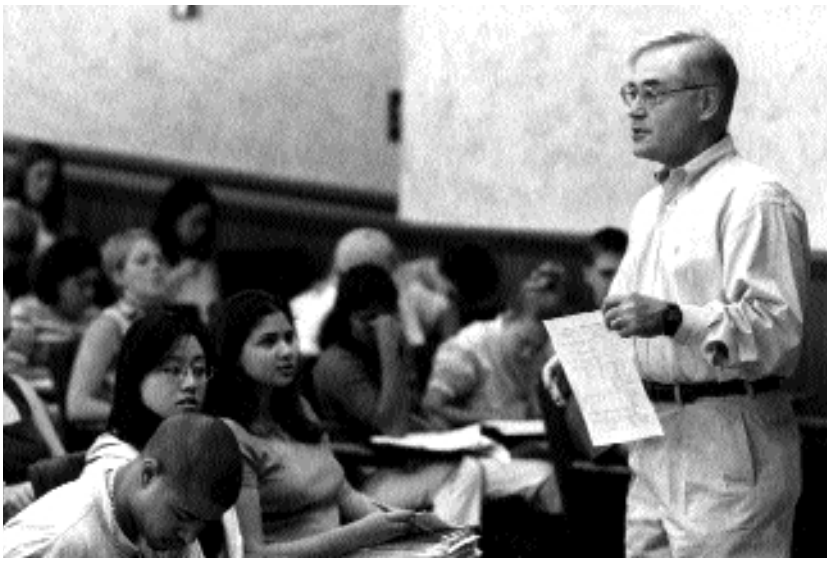
Michael McCullough had been so successful that in 1994, McCullough decided to start a similar program in environmental studies. Though he was now a medical student at the University of California at San Francisco, he teamed with Stanford senior Ana Rowena Mallari to start the Stanford Youth Environmental Science Program (SYESP), jointly sponsored by Stanford Law School and Human Biology. SYESP is a five-week residential summer camp dedicated to teaching about twenty gifted underprivileged high-school students about environmental issues. Hum Bio professor Ellen Porzig served as SYESP's first academic advisor, and numerous Hum Bio teachers have lectured and taught in the program. Many Hum Bio students serve as advisors and in other staff positions in the program. SYESP prepares its students for careers in environmental fields, encourages community outreach tailored to issues facing low-income and minority neighborhoods, and prepares the students for college. The program has been enormously successful; many students have returned to their communities and started outreach programs. In some years, over 50 percent of the SYESP graduating class has been admitted to Stanford. The program continues today and is now known as the Quest Scholars Program.

NEW GRANTS AND FUNDS

As always, the search for funds to support Human Biology activities continued. In 1993, benefactor Lorry Lokey donated funds to establish a student award for outstanding research proposals. Other awards, such as the director's award and an award for outstanding work as a faculty advisor, were also created. Lorry Lokey and Bowen H. and Janice Arthur McCoy funded four environmental internships for Hum Bio students at the Environmental Defense Fund.

Also in 1993, an anonymous donor gave funds to establish three new Hum Bio awards, named in honor of program founders Colin Pittendrigh, Albert Hastorf, and Joshua Lederberg. The awards, given to graduating-senior Hum Bio students, recognize outstanding service to Hum Bio (Hastorf award), excellence in teaching (Pittendrigh award), and academic achievement (Lederberg award).

In 1995, Lorry Lokey created two



Craig Heller teaches A-side core course "The Human Organism," spring 2001.

major funds for Hum Bio—a program to bring distinguished scholars to Stanford as visiting faculty (the Lorry I. Lokey Visiting Scholar in Human Biology) and an endowed professorship (the Lorry I. Lokey/Business Wire Professor in Human Biology and Environment). The endowed chair is held currently by Craig Heller. Lorry Lokey has remained a steadfast supporter of Human Biology. He has a particular interest in the program, he says, not only because of its focus on environmental studies but because he sees Hum Bio as generally underfunded despite its importance and service to undergraduate education. Also in 1995, the Bingham family created the Bingham Award for Student Innovation, which provides financial help for creative student projects or research that affects the academic or larger community.

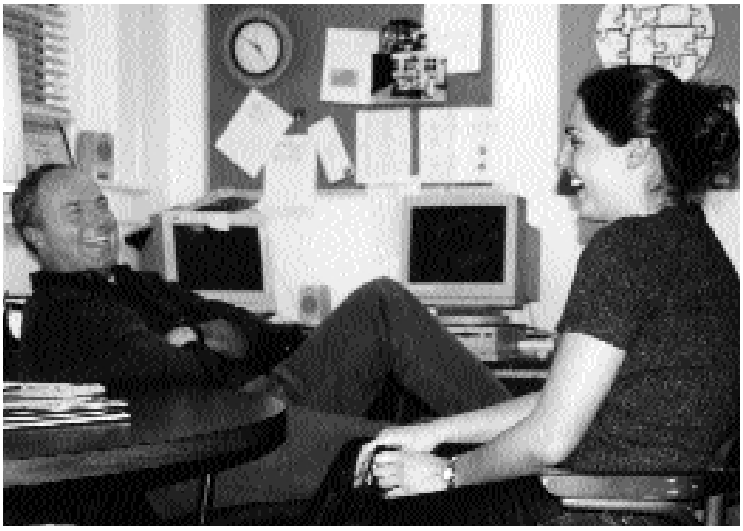
COMMISSION ON UNDERGRADUATE EDUCATION

In 1994, Stanford's Commission on Undergraduate Education, appointed by president Gerhard Casper, undertook to ascertain what constituted a successful undergraduate major. As part of their study, the commission's subcommittee on majors surveyed alumni from twelve representative majors at Stanford, including Human Biology. The survey asked alumni to rate their majors on teaching, intellectual stimulation, and whether the alumni would choose the same major again. Most alumni rated Hum Bio as very effective in all these areas.

After the survey and evaluation, the subcommittee examined the five majors deemed most successful, again including Human Biology. In its report describing what makes an effective major and articulating standards departments should strive to achieve, the subcommittee listed some of Hum Bio's salient features such as faculty interest in teaching undergraduates, senior thesis or project, student feedback, strong teaching-assistant support, and active advising.

As a B-side CA for the core, I found working with professors and other CAs, leading section discussions, and interacting with students all to be very valuable, enlightening experiences. I often felt I was learning Hum Bio principles in greater depth during the teaching process. An anthropology course I took as a Hum Bio major first got me interested in health beyond the biological level and led me to do honors research on sociocultural perceptions of diabetes among urban Australian Aborigines. Being a CA gave me time to complete a master's degree in anthropology, think about my goals, and make my decision to pursue a career in public health. At Stanford, we sometimes take for granted all that Hum Bio offers, but speaking with people from other schools has shown me how unique the program is.

—Laura Chyu, class of 1999



Russ Fernald advises student Natalie Rumble.

Russell Fernald Becomes Director

At the end of 1995, Bill Durham's years as Human Biology director ended, and he went on to chair Stanford's new anthropological-sciences department.

Larry Goulder teaches the B-side core course "The Human Predicament," spring 2001.

Daria Mochly-Rosen and student Leo Lin review some research data.

He is still much involved with Hum Bio, teaching and coordinating the 2A (fall quarter) portion of the core with Carol Boggs, leading field seminars, and teaching upper-division Hum Bio courses.

Neuroscientist Russell Fernald, Hum Bio's current director, began his term in January 1996, as Hum Bio celebrated twenty-five successful years. Fernald has continued the tradition of innovation and dedication that characterized his predecessors. Well known for his research on how social behavior influences the brain, he came to Stanford's psychology department in 1990 from the University of Oregon, where he was a cofounder and director of the Institute for Neuroscience.

Fernald's interest in the Human Biology program predated his arrival at Stanford. He joined Hum Bio soon after his arrival and began lecturing in Hum Bio 4A, spring quarter of the core. He also taught upper-division courses such as "The Biological Basis of Behavior." Fernald proved to be a superior leader in both classroom and laboratory. In 1998, in awarding him the Allan V. Cox Medal for Faculty Excellence in Fostering Undergraduate Research, Fernald was cited "for creating a laboratory environment where undergraduates are valued partners appreciated for their unique contributions to the research enterprise; for being an inspirational hero who engages neophyte scientists in research and remarkable mentorship which leads undergraduates to research grants, publications in scientific journals, and graduate school; for developing seminars and curriculum which place research at the center of the

Human Biology major and the Stanford undergraduate experience." (*Stanford Report,* June 17, 1998)

As senior faculty have begun to retire from active teaching, Fernald has brought in new faculty to teach in the core, including Daria Mochly-Rosen from molecular pharmacology, Larry Goulder from economics, Anne Fernald from psychology, and Joanna Mountain from anthropological sciences. In directing the program, Fernald is assisted by administrator Linda Perry, who joined Hum Bio in 1997, and Lia Cacciari, student services coordinator.

HUM BIO USES THE INTERNET

In the spring of 1998, Human Biology teamed with Stanford's Learning Lab to develop online problem sets for students in the core. Coordinators of Hum Bio 4A ("The Human Organism") Russell Fernald and Craig Heller, together with their A-side CAs, began administering weekly problem sets on the Internet. Web-based problem sets allow students to complete and submit their assignments electronically. An automatic grading system generates summaries of class and individual progress, allowing professors and CAs to view student rationales, monitor progress, and email helpful feedback. Fernald astonished students when he sent a personal email to each of the 240 students in the core. Little did they know that the director was following their progress so closely!

In 1998–99, the web-based problem sets were expanded to include both A and B sides of the core and all academic quarters. Students, CAs, and faculty are enthusiastic about the new program and agree that using the Internet this way enhances student involvement, makes discussion sections more useful, and promotes greater individual student–faculty communication. After Hum Bio and the Learning Lab pioneered the new method, it was adapted for use in other programs and departments.

In another use of the Internet, in spring 2000, B-side core ("The Human Predicament") coordinator Donald Kennedy initiated online policy discussions. Policy issues were posted, along with various responses or solutions, and students were asked to vote for a response and then explain and defend their choice. Because the students' rationales were posted online, interactive discussions and immediate review were possible.

In spring, 2001, Hum Bio major Christy Zenner originated and produced a public symposium, called The Wisdom Project, that was partially financed by the Bingham Fund for Student Innovation.

I became enthralled by our society's reticence to recognize human mortality. The Wisdom Project, a conference and exploration of death, dying, and end-of-life care, emerged as a natural synthesis of my personal passions.… Russ Fernald's implicit faith in the project and in my capabilities typifies the support Stanford offers to a student who has a passion, an idea, and the desire to see a dream become reality.… Despite—and perhaps because of—my infinite hours spent shaping the conference, The Wisdom Project's exploration into end-of-life care issues inspired more questions than answers. That was, after all, the point: to sanction and facilitate an exploration of what it means to be human, what it means to be mortal, and what an understanding of dying can reveal about how we live our lives.

—Christy Zenner, class of 2001

Human Biology turned what started out being a simple freshman-English assignment into one of the most meaningful experience of my life. In my English course, one of the assignments was to complete a community-service writing project.… Intrigued by the possibility of communication with another part of the world, I chose to write about health education for Happy Environment and Living Through Hygiene (HEALTH), a nongovernmental organization based in Sierra Leone.… Sophomore year arrived, and I began the Hum Bio core. I developed an 'A-sided' interest in immunology and infectious diseases … At the same time, I discovered a 'B-sided' part of me and explored courses in third-world development, anthropology, and health policy.… Hum Bio nurtured, cultivated, and sustained what initially began as a fanciful thought … of seeing a country I had only read about. My dream became a reality when I traveled to Sierra Leone in the summer of 1996 to conduct fieldwork for my honors thesis on the determinants of infant and child mortality in Freetown. My background in infectious disease, medical anthropology, and development policy provided me with the tools and thought processes to examine this complex topic in the interdisciplinary spirit of Hum Bio.

—Catherine Liu, class of 1997

PROGRAM REVIEW HIGHLIGHTS FUNDING CRUNCH

Since Human Biology's founding grant from the Ford Foundation expired in 1975, the program's support had come from Stanford and outside donations from alumni and other benefactors. Money was always tight—a common plight for interdisciplinary programs. By the 1990s, the situation had become critical. Between 1991 and 1998, Human Biology attracted increasing numbers of students: the number of Hum Bio majors increased 46 percent, and course enrollment grew 41 percent. Hum Bio remained the second largest major at Stanford, accounting for about 13 percent of the university's total graduates. However, in contrast to its rapidly increasing student population, Hum Bio's university funding increased only 9 percent from 1991 to 1998. Hum Bio received some outside donations, which were indispensable. These had gone from providing 20 percent of Hum Bio's budget to providing 80 percent. With severely limited funds, the program was having difficulty continuing to create new courses, hire faculty, train its CAs and SAs, and devise innovative programs such as web-based problem sets.

The crisis was highlighted by the academic senate's five-year interdisciplinary-program review of Hum Bio, which took note of the funding problems and the need for more university support of the program, especially in hiring faculty. The review noted Human Biology's many strengths and recognized that a high percentage of Hum Bio students pursue honors, attend graduate school, and receive university and national awards such as Phi Beta Kappa and graduate fellowships. The academic senate voted to renew Human Biology for the maximum allowable renewal term of eight years.

GIFTS AND ENDOWMENTS

In spite of the university-funding crunch, Hum Bio has been sustained by endowments that support new research and teaching programs. In 1997, Nobel laureate Baruch Blumberg became the first Lokey Visiting Scholar in Human Biology. Blumberg, a medical doctor and professor at the University of Pennsylvania, had received a Nobel Prize in 1976 for his discovery of the hepatitis-B virus and research on the human immune system. For two years, he taught Hum Bio courses on human disease and the action of viruses.

The endowed chairs are of great ben-

efit to the program. Hum Bio's original four chairs funded in the 1970s, the Lokey chair created in 1995, and the Lokey Visiting Scholar fund provide essential resources to hire faculty.

In addition, new funds to aid student research have been endowed. In 1998, donors Bill and Jan Crandall funded the Beagle II Award for Summer of Exploration to aid student "voyages of discovery" for travel research and study. A Hum Bio teacher, attorney William Abrams, in honor of his parents endowed the Edith and Norman Abrams Research Fellowship in Children, Youth, and the Law to help students finance work in that area.

Several other awards and grants were established through the generosity of donors—The Sandy Dornbusch Award for Excellence in Research Related to Families and Children, the Kirsten Frohnmayer Award honoring a student who has combined academic excellence with public service, and the Bernard and Estelle Shuer Award in Neuroscience Research.

EVOLUTION OF THE CURRICULUM

In response to desires on the part of students for more continuity in internships, Human Biology established the Service-Learning program. Through partnerships with local nonprofit community-service agencies, particularly health clinics, Service-Learning seeks to improve the internship experience. Students can be trained in advance for their internship work, more advising is available, and there is opportunity for reflection when an internship is completed.

Anne Fernald and student Emiley Chang discuss a course.

The corps of six SAs are still very active in helping Hum Bio students choose internships, plan areas of concentration, and obtain a faculty advisor in the student's area of interest. The SAs receive more training than ever and are supervised by Carol Boggs.

To offer sequences of related upper-division courses that Hum Bio majors might use as part of their areas of concentration, three tracks have been maintained: environmental policy, health-care policy, and health and human performance. New faculty and courses were added, such as Anne Maggioncalda's "Primate Societies"; Armin Rosencranz's "Natural Resources Policy and Law"; Donald Barr's "American Health Policy"; William Abrams's "Children, Youth, and the Law"; Anne Firth-Murray's "Critical Issues in International Women's Health"; Anne Friedlander's "Exercise Physiol-

Carol Boggs

Donald Barr

Hum Bio was one of the few science programs at Stanford that consistently encouraged building relationships between faculty and undergrads. It is a program that fully embraces and encourages the diversity of interests and dreams that students bring to this university.

—Sibyl Diver, class of 1997

Of all the professors I have had the privilege to take a class from and work with, Herant Katchadourian's concern for the quality of undergraduate education stands out. He is constantly striving to make the Human Biology Program an excellent learning experience for students. As his TA, I had many meetings with him, and he constantly asked how he could make his course better and more responsive to student needs and wants. He is genuinely interested in getting to know his students individually (hard to do with classes as popular as his) and listens intently to what is said to him. He is a charismatic lecturer who has the ability to entertain and teach at the same time, making students more interested in the material at hand.
—Ashley Johnson, class of 1998

ogy"; and Malcolm Cohen's "Astrobiology and Space Exploration." For majors who choose not to do an honors thesis, a senior seminar course was started to give students an opportunity to synthesize their knowledge in a capstone Hum Bio class.

Russ Fernald has continued to look for innovative ways to enhance students' learning. In 2000, he was given Stanford's Dinkelspiel Award for, as the citation stated, "his contribution to undergraduate education as director of the Human Biology Program, leading by example with infectious enthusiasm, creativity, and high standards." In 2001, he inaugurated a new program that brings sophomores finishing the core into laboratories where they can experience research firsthand during the summer. The program matches students interested in research with scientists who act as mentors, giving students insight into how knowledge is acquired through scientific research.

Now, in 2001, many of the classic Hum Bio courses are still being taught, though all have evolved and added innovations. Ellen Porzig created a course called "Virtual Vertebrates" that uses sophisticated software to simulate the biomechanics of swimming vertebrates. Carl Djerassi continues a course that discusses gender issues in birth control. Some long-running classic courses have ended: preparing to retire, Herant Katchadourian taught his famous "Human Sexuality" for the last time in spring 2001. As always, the core changes in response to the interests of new faculty, students' evaluations, and the suggestions of CAs. As it has since 1970, the Human Biology Program looks forward, now building on thirty successful years of innovation and excellence in education.

Herant Katchadourian teaches "Human Sexuality" course for the last time, spring 2001.

THE FUTURE

HUMAN BIOLOGY HAS HAD AN EXTRAORDINARY HISTORY. Using any measure—number of students enrolled and graduated, student awards at the university and national level, placement of students in professional and graduate schools, faculty awards—the program has been a resounding success. Moreover, Human Biology has achieved this while remaining deliberately interdisciplinary, constrained physically and financially by a university organization that favors standard departmental structures. Hum Bio's record of educating about 10 percent of all Stanford undergraduates every year for the past three decades has not changed the way the program is viewed by the university, leaving Hum Bio today with much the same struggle for resources that the founders faced. Thus, despite substantial evidence of the need for interdisciplinary teaching and research, Human Biology remains a bit like a plant flowering between the bricks of the academy. Its continued success is attributable not only to the remarkable insights and dedication of the founders but also to the creative contributions of subsequent faculty and the enthusiasm of curious, motivated Stanford students of yesterday and today. The students' curiosity, desire to understand, and motivation to improve the world we live in gives Hum Bio its vital energy.

Where is Human Biology headed, and what challenges does it face? The societal disorder that formed the backdrop for founding Human Biology has been replaced by new and different challenges. Increasing globalization has changed the nature of our population both at Stanford and across the U.S. The rich diversity of Stanford's students makes new demands on the Hum Bio curriculum. Amidst economic prosperity serious societal problems persist, including poverty in the U.S. and abroad. The environment is under siege

from the demands of continued growth and consumption of resources. In particular, global warming has been recognized by most countries as a serious long-term threat to the planet. Within the past year, a draft sequence for the human genome has become available, raising the hope for a new era of genetically based medicine. Understanding the genetic basis of diseases, including mental disorders, seems within the grasp of the next generation of scientists and physicians. Moreover, the recent isolation of stem cells from humans suggests the possibility of repairing damaged body parts or generating new ones. New techniques for studying the brain and nervous system have begun to reveal how we learn and how brain structures interact to produce memories. All of this new knowledge needs to be woven into an understandable context for undergraduates to prepare them for lives that will certainly be different from ours.

Today's students need to ask whether we ought to do all that we can do. What limits should there be on the use of new genetic and other biological information? What limits should be placed on what we take from our ecosystems? The need for clear scientific understanding of these and other issues within their social contexts is more important than ever. The ethical questions arising from rapid scientific advances intensify this challenge. Human Biology must continue to teach the biological and social sciences needed for the future and must not shrink from advocacy about society's needs.

Some of what Hum Bio has done in the past remains central to its future mission. Teaching evolution, for example, seems more important than ever as humans produce rapid evolution in other species—and perhaps our own—by changing environments and altering genetic material. We have produced evolution of antibiotic resistance in bacteria, herbicide resistance in plants, pesticide resistance in insects, and even changes in the growth rate of fish due to

overfishing. Emphasis on ethical aspects of current issues is important. Hum Bio needs to expand its teaching of what it means to know the human genome, how stem cells might be directed to desired outcomes, how human activity influences global systems, and, most importantly, how to think about what we know and the knowledge still to come. Students must be educated to make policy decisions about the use of biological advances based on clear, ethical thinking.

Graduates today enter professional life to work in ways still being discovered. They likely will change jobs and even professions several times during their lives. Human Biology offers students an education that will sustain them through an uncertain future. Certainly, continuing to place in context the biology and social science of human studies is imperative. Teaching cross-cultural thinking about issues is also essential, given the cultural diversity of our world. The next thirty years in Human Biology will bring changes, but the need will continue for an innovative program and committed faculty to teach material beyond narrow disciplinary boundaries. To meet these challenges, the program turns to its graduates—past, present, and future—for continued support and insight.

—Russell Fernald

HUMAN BIOLOGY ENDOWED PROFESSORSHIPS

The Bing Professorship in Human Biology
(established with a matching grant from the Ford Foundation)
- William H. Durham,1994–present
- H. Craig Heller, 1986–1994
- Richard F. Thompson, 1976–1985
- Colin S. Pittendrigh, 1971–1976

The Reed-Hodgson Professorship in Human Biology
(established with a matching grant from the Ford Foundation)
- Daria Mochly-Rosen, 1997–present
- Sanford M. Dornbusch, 1978–1995
- David A. Hamburg, 1973–1978

The Josephine Knotts Knowles Professorship in Human Biology
(established with a matching grant from the Ford Foundation)
- Anne Fernald, 1996–present
- Frank Stockdale, 1990–1995
- Merton R. Bernfield, 1977–1989

The Benjamin Scott Crocker Professorship in Human Biology
(established with a matching grant from the Ford Foundation)
- Russell D. Fernald, 1996–present
- Albert H. Hastorf, 1979–1990
- Donald Kennedy, 1975–1978

The Lorry I. Lokey/Business Wire Professorship in Human Biology and Environment
- H. Craig Heller, 1995–present

The Lorry I. Lokey Visiting Scholar in Human Biology
- Anne Firth-Murray, founder, Global Fund for Women, 2000–2001
- Megan Gunnar, professor, University of Minnesota, 1999–2000
- Baruch Blumberg, Nobel laureate, 1997–1999

HUMAN BIOLOGY PROGRAM AWARDS

Joshua Lederberg Award for Academic Excellence in Human Biology
- 1992/93 Sandra Bliss, Howard Chow, Julia Novy
- 1993/94 Arash Anoshiravani, Risa Hoffman, Elizabeth Springer
- 1994/95 Yi Wen Liu, Natalie Shukov
- 1995/96 Belinda Fu, Sarah (Pei-Pei) Mark, Robert Yeh
- 1996/97 Eu Meng Lam, Catherine Liu, Judy Ou
- 1997/98 Grace Yu, Bret Mobley, Emily Gestrin, Jeffrey Szekeres
- 1998/99 Mary Harcombe, Elizabeth Langen, Kimberly Young
- 1999/00 Cori McClure, Kimberly Young, Ali Zaidi
- 2000/01 Erin Sones, Clea Lopez, Margaret Wizenberg, Lily Chiang, Theresa Sgobba

Colin S. Pittendrigh Award for Excellence in Teaching Human Biology
- 1992/93 Courtney Hayes
- 1993/94 Lorriana Leard
- 1994/95 Leo Sugrue, Erica Goldman
- 1995/96 Natalie Shukov, Sarah Mather
- 1996/97 Robert Langen, Sanjai Rao
- 1997/98 Ajai Dandekar, Katherine McCallie, Julie Sugino
- 1998/99 Belinda Fu, Kristine Penner
- 1999/00 Aaron Bernstein, Vivian Truong
- 2000/01 Janet Altman, Rahul Hate, Nina Chinosornvatana, Apajarita Sohoni, Vivian Truong, Ramin Shadman, Natalie Dumont, Clea Lopez, Katrina Abuabara, Laura Chyu

Albert H. Hastorf Award for Outstanding Service to Human Biology
- 1992/93 Karyn Goodman, Sheila Scheel
- 1993/94 Carol Cho, Heather Marks
- 1994/95 Melissa Freeberg, Jen Sokolove
- 1995/96 Amy Vinther
- 1996/97 Gautam Deshpande, Meredith Heller
- 1997/98 Pauline Brutlag, Janet Byun, Jean Lee
- 1998/99 Rich Bae, Gautam Deshpande
- 1999/00 Nina Chinosornvatana, Nkem Ogbechie, Ramin Shadman, Aparajita Sohoni
- 2000/01 Ritu Chitkara, Sylvia Lin, Melissa Neuwelt, Nkem Ogbechie, Ganesh Shankar, John Turnbull

Sandy Dornbusch Award for Outstanding Research Related to Families and Children
- 1995/96 Alice Steenland
- 1996/97 Cabral Bonner
- 1997/98 S. Jhumki Basu
- 1998/99 Jennifer Cohen, Anne Porzig
- 1999/00 Lisa Meneses
- 2000/01 Sameena Beguwala, Sarah Hemmer

Kirsten Frohnmayer Award for Research and Service in Human Biology
- 2000/01 Jennifer Dorth
- 2001/02 Abigail Shaw

STANFORD UNIVERSITY TEACHING AWARDS

Lloyd W. Dinkelspiel Award for Distinctive Contributions to Undergraduate Education
- 1970/71 William Durham (student)
- 1975/76 Donald Kennedy
- 1978/79 Albert Hastorf
- 1978/79 Alison Ross (student)
- 1979/80 Gray Boyce (student)
- 1983/84 Deborah Prentice (student)
- 1987/88 Anne Fernald
- 1992/93 Herant Katchadourian
- 1994/95 Rowena Mallari (student)
- 1997/98 Holly Hindman (student)
- 1999/00 Russell Fernald, Rita Ng (student)

Richard Lyman Award for Volunteer Service at Stanford
- 1986 Herant Katchadourian
- 1997 Albert H. Hastorf
- 2000 William Durham

Walter J. Gores Award for Excellence in Teaching
- 1970/71 James Dice, Jr. (CA)
- 1973/74 Susan Henning (CA)
- 1976/77 H. Craig Heller
- 1977/78 Robert Dorit (CA)
- 1982/83 William Durham
- 1983/84 Katie Newhall (CA), Sanford Dornbusch
- 1989/90 Ellen Porzig

ASSU Award for Excellence in Teaching
- 1990/91 William Durham
- 1991/92 Anne Fernald, Herant Katchadourian
- 1999/00 Robert Siegel

Dean's Award for Excellence in Teaching
- 1978/79 William Durham

Hoagland Prize for Excellence in Undergraduate Education
1986/87 John W. Rick
1994/95 Anne Fernald

Allan V. Cox Medal for Fostering Undergraduate Research
1992/93 Anne Fernald
1995/96 James Gibbs
1997/98 Russell Fernald

Rhodes Prize for Outstanding Service to an Interdisciplinary Program
1995/96 William Durham

Henry J. Kaiser Family Foundation Award for Preclinical Teaching
1997/98 Robert Siegel
2000/01 Ellen Porzig

Bing Prize for Excellence and Innovation in Undergraduate Teaching
1992–95 William Durham
1996–99 Russell Fernald

NATIONAL AND INTERNATIONAL STUDENT AWARDS

Rhodes Scholarship
1987/88 Stewart Patrick
1989/90 Michael McCullough
1990/91 Kim Grose
1995/96 Alvan Ikoku

Marshall Scholarship
1978/79 Lori Ann Thrupp
1986/87 Nathan Selden
1987/88 Jennifer Tucker
1993/94 Angela Bakker (TA)
1994/95 Julia Novy
1996/97 Robert Yeh

Fulbright Fellowship
1992/93 Julia Novy
1994/95 Michelle Rhee
1996/97 Daniela Kim
1997/98 Christina Chan, Janet Maldonado
2000/01 Erica Ye-Pyng Chung

Howard Swearer Humanitarian Award
1997/98 Kristine Penner

Truman Scholarship
2000/01 Donald Matsuda

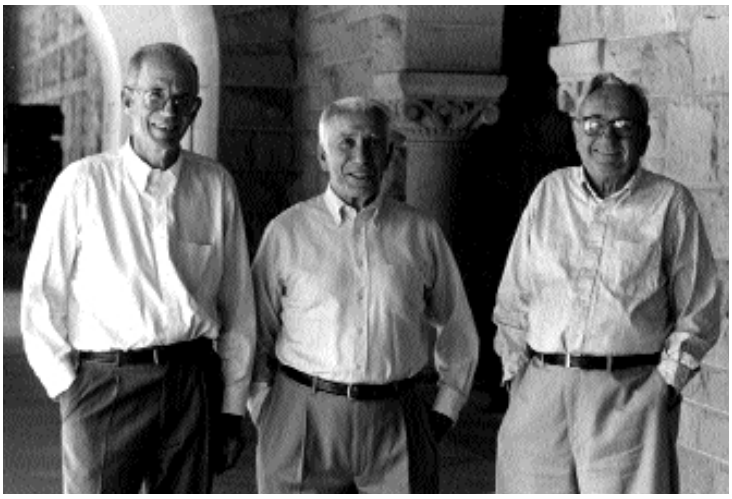
STANFORD UNIVERSITY STUDENT AWARDS

Dean's Award for Academic Achievement
1992/93 Angela Bakker (TA)
1993/94 Mimi H. Feng Kao, Albert Ying-Hwa Liu
1994/95 Jinoos Yazdany
1995/96 Farhad Imam, Robert Yeh
1996/97 Catherine Liu, Mathew Old
1997/98 S. Jhumki Basu
1998/99 Kalee Magnani
1999/00 Melora Krebs-Carter
2000/01 Ayaba Worjoloh

James W. Lyons Award for Service
1981/82 Elizabeth Budd
1982/83 Deborah A. Prentice
1983/84 Steven Elig, Sheila Scobba
1984/85 Jack Chin, Jeffrey Gelles, Susan Mathison
1985/86 Judith David, Laurie Larson, Jeffrey Upperman, Margaret Richman & the SAs Jack Alden, Phyllis Hayes, Beth Kneeland, David Matthes, Nathan Selden, Marivern Slack
1987/88 Tae Choi, Matt Gallagher
1991/92 Traci Baird, Gayatri Taneja
1992/93 Eva Silva, Darcy Thompson
1993/94 Seema Jain, Arash Anoshiravani
1994/95 Alisa Kamigaki, Rowena Mallari, Elizabeth Springer
1995/96 Una Lee, Aaron Lehman, Jonathan Miller
1996/97 Angela Amarillas, Atesa Farshian, Eileen Lai, Terry Jue
1997/98 Holly Hindman
1999/00 Sarah Adelman, Melora Krebs-Carter, Elizabeth Lau, Irene Linetskaya
2000/01 Alan Teo

John Gardner Public Service Fellowship
1986/87 Elizabeth Butler
1990/91 Srija Srinivasan
1993/94 Ying-Ying Goh
1994/95 Molly Leigh Parker
1997/98 Marie Soller, Sarna Renfro

Firestone Medals for Excellence in Undergraduate Honors Research
1984/85 Ronald J. Green, Garrett Smith
1985/86 Seth Glick
1986/87 Michelle Mikules
1987/88 Brian Francis, Sharoni Shafir
1988/89 David Huchton, Sue Woodward
1989/90 Stacy Hurd, Lawrence Sincich
1990/91 Traci Ann Takahashi, Lynette Marea Mungai, Anthony John Loffredo
1991/92 Craig Klugman, Han Ne Lee
1992/93 Roger Cornwall, Flora Lu, Bridget Norman
1993/94 Christina Hong, Mimi H. Feng Kao, Sergio Knaebel, Aneema Van Groenou
1994/95 Julie Kikuchi, Aimee Meisenzahl, David Presser, Elizabeth Rice
1995/96 Farhad Imam, Charmian Lewis, Tuan Nguyen, Alice Steenland, Robert Yeh
1996/97 Erin Carlson, Theresa Gurney, Catherine Liu, Matthew Old, Cynthia Yock, Irene Yun
1997/98 Jennifer Jolley, J. Sulggi Lee, Janet Maldonado, Ajai Dandekar, Emily Gestrin
1998/99 Aaron Bernstein, Kalee Magnani, Danielle Rees, Aparajita Sohoni, Vivian Tsai, Rachel Wong
1999/00 Ebony Boyce, Phillina Lai, Rita Ng, Eric Nudleman, Jessica Lehman, Aparajita Sohoni
2000/01 Jennifer Dorth, Shira Lipton, Caroline Perry, Stacey Woo



Don Kennedy, Sandy Dornbusch, and Al Hastorf gather in May 2001 to reminisce about Human Biology.

Teachers affect eternity;
they can never tell where
their influence stops.

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Louise Roche, writer/editor; Coco Ballantyne, researcher/writer; Megan Hendershott, copy editor; Susan Wilson, designer

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1985/86
2A & 2B Human Evolution: Genetics and Culture: William Durham (2A); Clifford Barnett (2B)
3A Properties of the Individual: Merton Bernfield
3B Properties of Society: Shirley Feldman
4A The Human Organism: Craig Heller
4B Social Process of Decision Making: Sandy Dornbusch

1986/87
2A Genetics, Evolution, and Ecology: William Durham
2B Culture, Evolution, and Society: Arthur Wolf
3A Properties of the Individual: Merton Bernfield
3B Adaptation and the Development of Social Processes: Shirley Feldman
4A The Human Organism: Craig Heller
4B Adaptation and Social Control: Herant Katchadourian

1987/88
2A Genetics, Evolution, and Ecology: William Durham
2B Culture, Evolution, and Society: Arthur Wolf
3A Properties of the Individual: Frank Stockdale
3B Adaptation and the Development of Social Processes: Shirley Feldman
4A The Human Organism: Craig Heller
4B Adaptation and Social Control: Herant Katchadourian

1988/89
2A Genetics, Evolution, and Ecology: William Durham, Carol Boggs
2B Culture, Evolution, and Society: Arthur Wolf
3A Properties of the Individual: Merton Bernfield
3B Adaptation and the Development of Social Processes: Shirley Feldman
4A The Human Organism: Craig Heller
4B Adaptation and Social Control: Herant Katchadourian

1989/90
2A Genetics, Evolution, and Ecology: Carol Boggs
2B Culture, Evolution, and Society: John Rick
3A Properties of the Individual: Frank Stockdale
3B Adaptation and the Development of Social Processes: Shirley Feldman
4A The Human Organism: Craig Heller
4B Adaptation and Social Control: Herant Katchadourian

1990/91
2A Genetics, Evolution, and Ecology: William Durham, Carol Boggs
2B Culture, Evolution, and Society: Arthur Wolf
3A Properties of the Individual: Frank Stockdale
3B Adaptation and the Development of Social Processes: Shirley Feldman, Albert Hastorf
4A The Human Organism: Craig Heller
4B Adaptation and Social Control: Herant Katchadourian

1991/92
2A Genetics, Evolution, and Ecology: Carol Boggs
2B Culture, Evolution, and Society: John Rick
3A Cell Biology and Human Development: Frank Stockdale
3B Adaptation and the Development of Social Processes: Shirley Feldman
4A The Human Organism: Craig Heller, Russell Fernald
4B Adaptation and Social Control: Herant Katchadourian

1992/93
2A Genetics, Evolution, and Ecology: William Durham, Carol Boggs
2B Culture, Evolution, and Society: Arthur Wolf
3A Cell Biology and Human Development: Ellen Porzig
3B Child and Adolescent Development: Shirley Feldman, Herant Katchadourian
4A The Human Organism: Craig Heller, Russell Fernald
4B Development in Adulthood: Herant Katchadourian

1993/94
2A Genetics, Evolution, and Ecology: Carol Boggs, William Durham
2B Culture, Evolution, and Society: Richard Klein, John Rick
3A Cell Biology and Developmental Biology: Frank Stockdale
3B The Human Life Cycle: Shirley Feldman, Herant Katchadourian
4A The Human Organism: Russell Fernald, Craig Heller
4B The Human Predicament: Donald Kennedy

1994/95
2A Genetics, Evolution, and Ecology: William Durham
2B Culture, Evolution, and Society: Richard Klein
3A Cell Biology and Developmental Biology: Frank Stockdale
3B The Human Life Cycle: Shirley Feldman, Herant Katchadourian
4A The Human Organism: Russell Fernald, Craig Heller
4B The Human Predicament: Donald Kennedy

1995/96
2A Genetics, Evolution, and Ecology: William Durham
2B Culture, Evolution, and Society: Richard Klein
3A Cell Biology and Developmental Biology: Frank Stockdale
3B The Human Life Cycle: Shirley Feldman, Herant Katchadourian
4A The Human Organism: Russell Fernald, Craig Heller
4B The Human Predicament: Donald Kennedy

1996/97
2A Genetics, Evolution, and Ecology: Carol Boggs
2B Culture, Evolution, and Society: Richard Klein
3A Cell and Developmental Biology: Helen Blau
3B The Human Life Cycle: Anne Fernald, Herant Katchadourian
4A The Human Organism: Russell Fernald , Craig Heller
4B The Human Predicament: Donald Kennedy

1997/98
2A Genetics, Evolution, and Ecology: Carol Boggs, William Durham
2B Culture, Evolution, and Society: Richard Klein
3A Cell and Developmental Biology: Daria Mochly-Rosen, Ellen Porzig
3B The Human Life Cycle: Anne Fernald, Herant Katchadourian
4A The Human Organism: Russell Fernald , Craig Heller
4B The Human Predicament: Donald Kennedy

1998/99
2A Genetics, Evolution, and Ecology: Carol Boggs, William Durham
2B Culture, Evolution, and Society: Richard Klein, Arthur Wolf
3A Cell and Developmental Biology: Daria Mochly-Rosen, Ellen Porzig
3B Biology and Culture in Human Development: Anne Fernald
4A The Human Organism: Russell Fernald, Craig Heller
4B The Human Predicament: Donald Kennedy

1999/2000
2A Genetics, Evolution, and Ecology: Carol Boggs, William Durham
2B Culture, Evolution, and Society: Richard Klein, Arthur Wolf
3A Cell and Developmental Biology: Daria Mochly-Rosen, Ellen Porzig
3B Biology and Culture in Human Development: Anne Fernald
4A The Human Organism: Russell Fernald, Craig Heller
4B The Human Predicament: Donald Kennedy

2000/01
2A Genetics, Evolution, and Ecology: Carol Boggs
2B Culture, Evolution, and Society: Richard Klein
3A Cell and Developmental Biology: Daria Mochly-Rosen
3B Biology and Culture in Human Development: Anne Fernald
4A The Human Organism: Russell Fernald, Craig Heller
4B The Human Predicament: Carol Boggs, Lawrence Goulder

PROGRAM IN HUMAN BIOLOGY

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