TO THE MEMBERS OF THE ACADEMIC COUNCIL  
FORTY-FIFTH SENATE REPORT No. 10

Summary of Actions Taken by the Senate  
May 16, 2013

At its meeting on Thursday, May 16, 2013, the Forty-fifth Senate of the Academic Council heard a panel discussion on the future of the PhD degree.

Rex Jamison  
Academic Secretary to the University  
Professor of Medicine, Emeritus
I. Call to Order
The Chair of the 45th Senate, Ray Levitt, called the second meeting of Spring Quarter to order at 3:15 PM.

In attendance were 29 members, 10 *ex officio* members and many guests.

Chair Levitt announced the seven faculty members recently elected to the National Academy of Sciences:

- Greg Asner, faculty scientist in the Department of Environmental Earth System Science and at the Carnegie Institution’s Department of Global Ecology at Stanford;
- Ben Barres, Professor of Neurobiology, of Developmental Biology and of Neurology and Neurological Sciences;
- Marcus Feldman, Burnet C. and Mildred Finley Wohlford Professor in the School of Humanities and Sciences;
- Emmanuel Mignot, Craig Reynolds Professor of Sleep Medicine, School of Medicine;
- Alvin Roth, Craig and Susan McCaw Professor and Senior Fellow at the Stanford Institute for Economic Policy Research; and
- Stephen Quake, Lee Otterson Professor in the School of Engineering and Professor of Bioengineering, of Applied Physics and, by courtesy, of Physics.

Chair Levitt, “Please join me in congratulating them.”

[ Applause ]

II. Approval of Minutes – (SenD#6753)
The minutes of the Senate session, May 2, 2013, were approved as submitted.

III. Action Calendar
There were no items on the calendar.

IV. Standing Reports
A. Memorial Resolutions:
Chair Levitt invited Roger Warnke, the Ronald F. Dorfman Professor in Hematopathology, Emeritus, to present a brief memorial statement in honor of Ronald Dorfman, Professor of Pathology, Emeritus.
In attendance was Yasodha Natkunam, Professor of Pathology at Stanford University Medical Center, and a member of the memorial resolution committee.

**Ronald Dorfman (1923-2012) SenD#6765**

Ronald F. Dorfman, MB BCh, Fellow, Royal College of Pathology, Professor of Pathology, died on June 15, 2012, of heart failure after a short illness. He was 89 years old.

Dorfman was born in Johannesburg, South Africa, in 1923. He entered medical school at the University of the Witwatersrand receiving his degree in 1948. In 1962, Dorfman was recruited by one of the world’s leading surgical pathologists, Dr. Lauren Ackerman, to join his surgical pathology department at Washington University School of Medicine in St Louis.

At Washington University, Juan Rosai and Dorfman brought together rare examples from St. Louis and South Africa of a distinctive but benign lymph node disorder that has since become known as Rosai-Dorfman disease. Dorfman also identified one of the first examples of Burkitt lymphoma outside of Africa, and together with other giants in the developing new field of hematopathology, put forth criteria for the accurate diagnosis of this potentially lethal but often curable childhood cancer.

In 1968, David Korn recruited Dorfman and fellow pathologist, Richard Kempson from Washington University, to co-found and co-direct the surgical pathology laboratory at Stanford Hospital. They rapidly developed one of the world’s foremost clinical, consultation, and teaching services. Dorfman co-directed this service for nearly 35 years until his retirement in 1993. In the 1970s, Dorfman worked closely with Stanford physicians Saul Rosenberg and Henry Kaplan to apply a classification and staging system that would accurately predict the effect of radiation-based treatment for Hodgkin lymphoma. These pioneering studies were instrumental in transforming this once fatal disease into one of the most curable forms of cancer. Dorfman, Rosenberg and Kaplan and their team played a major role in the large international study that led to a lymphoma classification schema called the “Working Formulation for Clinical Trials” that was used at many medical centers throughout the world for almost two decades. In 1982 Dorfman and Costan Berard from the NIH founded the Society for Hematopathology to promote investigation and exchange of ideas among hematopathologists worldwide.

Ron was a gifted diagnostician and teacher who was sought after for training by many young pathologists from across the U.S. and from foreign countries. Many prominent hematopathologists spent time with Dorfman at the teaching microscope and today help to keep his teachings alive in many parts of the world. In honor of Dorfman’s many contributions to the field of pathology, the Department of Pathology at Stanford has established an endowed professorship in his name.

Ron Dorfman was a consummate gentleman and scholar. He remained active until his death, playing golf on the Stanford course where he shot his age at 85 and had multiple holes-in-one. He also came to the department to consult on difficult diagnostic problems up until the week before he died.

Dorfman is survived by his wife Zelma, daughters Erica, Annie and Carol, brother Stanley, and two grandsons.
Mr. Chairman, I have the honor, on behalf of a committee consisting of Yasodha Natkunam, Robert Rouse, and myself, Roger Warnke, to lay before the Senate of the Academic Council a Resolution in the memory of the late Ronald F. Dorfman, Professor of Pathology Emeritus in the School of Medicine.

At Chair Levitt’s invitation, everyone stood for a moment of silence in tribute.

Chair Levitt thanked Professors Warnke, Natkunam, and Rouse.

Chair Levitt invited David Epel, the Jane and Marshall Steel Jr. Professor of Marine Sciences, Emeritus, to present the memorial statement for John Phillips, Professor of Biology, Emeritus.

**John Phillips (1925-2010) SenD#6766**

John Howell Phillips, Professor Emeritus and former Director of the Hopkins Marine Station, passed away on the Monterey Peninsula on April 5, 2010. He was educated at UC Berkeley, briefly tried his hand at coffee farming in Central America and then returned to Berkeley to receive a Ph.D in microbiology. Following post-doctoral work at Rutgers and Stanford, he returned to Berkeley as a faculty member and was recruited to the Hopkins Marine Station in 1962.

All who knew him appreciated his intense curiosity and how he boldly began new areas of research such as the origins of the immune system or the pathways of pesticide pollution. A pioneer in elucidating how pollutants such as DDT affected marine life, he was instrumental in raising awareness of the catastrophic influences of DDT on marine organisms and his efforts contributed to the successful ban of this chemical in 1972. He also played a pivotal role in developing educational programs at the Station that engaged undergraduates to carry out original research projects, an opportunity that was not available in the 1960’s but which is now commonplace at Stanford and other major universities.

During his period as Director of the Marine Station, John was indirectly responsible for siting the Monterey Bay Aquarium next to Hopkins. There was no Coastal Commission in the late 1960’s and John foresaw that the adjacent Cannery Row could soon be full of hotels, restaurants, and shops that would jeopardize the marine research preserve that surrounded the Station. He persuaded Stanford to purchase the adjacent Hovden Cannery as a buffer. His fortuitous action led to this property being available a decade later as an ideal site of the Aquarium.

Mr. Chairman, I have the honor of laying before the Senate a Resolution in memory of the late John H. Phillips, Professor Emeritus of Biological Sciences and Director of the Hopkins Marine Station on the behalf of a committee consisting of myself, David Epel, Vicki B. Pearse, and George Somero.

At Chair Levitt’s invitation, everyone stood for a moment of silence in tribute.

Chair Levitt thanked Professors Epel and Somero, and Vicki B. Pearse, University Staff, Hopkins Marine Library.
Chair Levitt invited Marcia Stefanick, Professor (Research) of Medicine (Stanford Prevention Research Center) and of Obstetrics and Gynecology, to present the memorial statement for Peter Wood, Professor of Medicine (Research) at the Stanford Center for Research in Disease Prevention, Emeritus.

In attendance was John Farquhar, Professor of Medicine and of Health Research and Policy, Emeritus, and a member of the memorial resolution committee.

**Peter Wood (1929-2011) SenD#6755**

Professor Peter D. Wood died March 3, 2011, of bile duct cancer, at the age of 81. Dr. Wood came to Stanford in 1969 and was Deputy Director of the Stanford Heart Disease Prevention Program from 1972-84, during which he played a major role on the Laboratory Methods Committee of the Lipid Research Clinics Program and on the Three Community Study, which evolved into the landmark Five City Project. He received two doctoral degrees in Lipid Biochemistry from the University of London, England, a Ph.D. in 1962 and a D. Sc. in 1972.

As an avid long distance runner, his quest to understand his own high levels of high density lipoprotein (HDL) cholesterol and low triglyceride levels prompted him to launch seminal research on the effects of exercise (predominantly running) on lipoproteins, leading to a series of high profile randomized, controlled exercise, diet and weight loss trials, which provided evidence for scientific consensus and national guidelines regarding lifestyle for heart disease prevention.

*Dr. Wood’s* passion for running included competing in 800 meter races well into his 70s, accumulating over 100 marathons, including at least 13 Boston and seven NYC marathons, over his lifetime, and climbing mountains in his later years, including Mt. Kilimanjaro at age 71. He co-founded the Fifty-Plus Runners Association, now known as the Lifelong Fitness Alliance. Dr. Wood was a world traveler who loved history, in particular the Great War (WWI), and literature.

*Mr. Chairman, I have the honor, on behalf of a committee consisting of John Farquhar and William Haskell, Professors of Medicine, Emeritus, and myself, Marcia Stefanick, Professor of Medicine and of Obstetrics and Gynecology to lay before the Senate of the Academic Council a resolution in the memory of the late Peter D. Wood Professor of Medicine.*

At Chair Levitt’s invitation, everyone stood for a moment of silence in tribute.

Chair Levitt thanked Professors Stefanick, Farquhar and Haskell.

Chair Levitt invited Stephen E. Harris, Kenneth and Barbara Oshman Professor in the School of Engineering and Professor of Applied Physics, Emeritus, to present the memorial statement for Anthony Siegman, the Burton J. and Ann M. McMurtry Professor in the School of Engineering, Emeritus.

In attendance were Anthony Siegman’s wife, Jeannie Siegman and Fran Harris, wife of Stephen Harris.
Anthony E. (Tony) Siegman, Professor of Electrical Engineering, Emeritus, died on October 7, 2011, at age 79. Tony was raised in rural Michigan and obtained his AB degree at Harvard and his PhD in Electrical Engineering at Stanford with Professor Dean Watkins.

In 1957 Tony joined the Stanford faculty as an Assistant Professor of Electrical Engineering. This was the beginning of the maser and laser era; amplification was now possible by using the quantum mechanical properties of atoms and molecules instead of the kinetic properties of electrons. By interfacing with quantum mechanics Tony contributed to a new definition of electrical engineering.

Tony’s students universally remember him as a warm and skilled teacher. Burt McMurtry was Tony’s first laser student and later contributed to Silicon Valley both as a venture capitalist and president of Stanford’s Board of Trustees. I was Tony’s second laser student and Burt, Tony and I had some fine times sending information on a beam of red light.

A prolific scientist and educator, Tony authored numerous papers and wrote the texts Microwave Solid-State Masers (1964), An Introduction to Lasers and Masers (1972), and Lasers (1986).

In 1999 Siegman was President of the Optical Society of America (OSA). In his honor, OSA will soon initiate the annual “Siegman International Summer School on Lasers.”

Tony Siegman’s awards and honors include the Institute of Electrical Engineering’s Baker Prize, and the OSA’s Wood Prize and Frederic Ives Medal. He was elected to the National Academy of Engineering in 1973, the American Academy of Arts and Sciences in 1984, and the National Academy of Sciences in 1998.

Mr. Chairman, I have the honor, on behalf of a committee consisting of David Miller and myself, Stephen E. Harris, to lay before the Senate of the Academic Council a Resolution in the memory of the late Anthony E. Siegman, Professor of Electrical Engineering in the School of Engineering.

At Chair Levitt’s invitation, everyone stood for a moment of silence in tribute.

Chair Levitt thanked Professors Harris and Miller.

A. Steering Committee
Chair Levitt turned to the Steering Committee announcements.

May 30: Administrative Session of the Faculty Senate at 2:15 pm in Room 180
Provost’s Annual Budget Report

June 13: Update on new programs and classes, VPUE Harry Elam.
Emeriti Report, David Abernethy
4:30 pm: President’s Reception for Senate 45 and Senate 46
B. **Committee on Committees (CoC)**

There was no report.

C. **President**

Chair Levitt asked, “President Hennessy, do you have a report to present today?”

President Hennessy replied, “I do not have a report to share but I’d be happy to address some questions.”

Professor David Palumbo-Liu had a question. “I’m wondering if you could comment on the reports that show some colleges and universities are using Pell Grant money in a way to decrease their need-based grants and increase their merit-based grants, to the effect that it takes money away from [grants for] lower-income students. This is supposedly done to increase their graduation rates and improve their rankings in the *US News and Report* survey. I’m wondering what we and our peers might do to offset the influence this has on the rankings.”

President Hennessy replied, “The recent study causing this concern is called, ‘Undermining Pell’ [How College Compete for Wealthy Students and Leave the Low-Income Behind], by the New America Foundation. Its focus is the rapid rise of merit-based aid at many institutions. You can’t actually move Pell Grant money around; if the student doesn’t come, you don’t get the Pell Grant money, but what’s happened is that the larger need-based financial aid that used to go along with the Pell Grant, if you cannot afford [the expenses not covered by the grant] to attend that college or university, that is what has dissolved. If you look at the 1995-96 time frame, need-based aid was $1.5 for every dollar of merit-based aid to a public school student, and $1.7 of need-based aid for every dollar of merit-based aid to a low-income student. Today, there’s about $1.1 of merit-based aid for every dollar of need-based aid. So essentially, the situation has completely flipped. It is--as you alluded to--about the *US News and World Report* and the quest for what are called, ‘full payers,’ students who could afford to pay all expenses beyond the grant aid. The higher your rankings go, the more full-payers you attract. These institutions are driving up their ratings by increasing the yield [the percent of students offered admission who accept the offer], as well as getting students who could be full-pay, but who will choose the institution who awards them a $3 to $5 thousand dollar grant.

“The good news is we’re listed in this report in a table entitled, ‘The Best of the Best of the Wealthiest Schools.’ We are one of the schools listed as having both a high Pell Grant rate, 18% [percent of undergraduates who are Pell Grant Recipients], as well as a generous financial aid program for Pell Grants recipients. Surprisingly, many of our East Coast peers, other than MIT, do not appear on this table. They appear in the table, one [level] down, or what you might label, ‘One of the places we need to work harder.’

[ Laughter ]

“The real challenge is going to be that between states cutting support to students and public colleges, and private institutions not having big enough endowments to provide sufficient financial aid. The effect will cause these institutions to try to balance their student body to get enough revenue to meet their costs. How exactly this plays out [remains to be seen] but one key will be how many lower-
income students can afford to attend these places, and whether we’ll see a shift [in that balance]. Right now, when you look at [what determines] graduation rates for low-income students, the number one issue is preparedness. The second issue is financial stress, but if these trends continue, then the financial stress is going to go way up, and we’re going to see it become an even bigger contributor to students not completing their studies.”

Chair Levitt, “Thank you President Hennessy, for a very comprehensive answer.”

**Provost**
Chair Levitt turned to the Provost, “Provost Etchemendy, you’re going to give us a big report next session. Are there announcements today?”

The Provost replied, “No, I don’t but I’m happy to answer any questions whose answers I know.”

[ Laughter ]

Chair Levitt responded, “Any easy questions for the Provost?”

[ Laughter ]
The Provost grinned, “Thank you, Ray, for that vote of confidence.”

[Laughter]

V. Other Reports
A. Future of the PhD Degree
Chair Levitt turned to the report: “Our main item of business today is to initiate a discussion on the future of the PhD degree. We have invited a panel of discussants that bring different perspectives from across the university’s disciplines. It was obvious that Russell Berman was the right person to organize the discussion, but we know how busy he is. When President Hennessy encouraged us that Russell would be the right person, we asked him, and of course, he agreed, for which I thank him.

“Let me emphasize that this is not meant to be a comprehensive discussion. We wanted to frame some issues that could be grist for next year’s Senate, which David [Palumbo-Liu] will chair.

Members of the Panel, in order of presentation, were:

Russell Berman, Walter A. Haas Prof in the Humanities, Professor of Comparative Literature and Senior Fellow at the Hoover Institution, will moderate the panel. Joining him is a distinguished and diverse group of panelists:

Debra Satz, Senior Associate Dean for the Humanities and Arts, The Marta Sutton Weeks Professor of Ethics in Society and Professor, by courtesy, of Political Science,

Dean Jim Plummer, Frederick Emmons Terman Dean, School of Engineering, John M. Fluke Professor of Electrical Engineering & Professor, by courtesy, of Materials Science & Engineering;

Josiah Ober, Tsakopoulos-Kounalakis Professor in Honor of Constantine Mitsotakis, Professor of Classics, and, by courtesy, of Philosophy,

Bob Simoni, Donald Kennedy Chair in the School of Humanities and Sciences and Professor of Biology, and

Daniel Herschlag, Senior Associate Dean, Graduate Education and Postdoctoral Affairs and Professor of Biochemistry and, by courtesy, of Chemistry and of Chemical Engineering.

Professor Berman began the presentation. “Thank you for inviting us. You’ll be relieved to know that this is not a committee, but a set of faculty with some thoughts about doctoral education.

“I’d like to make two statements as absolutes at the beginning: One is that doctoral education is an absolutely integral component to our life at a research university. It’s impossible to imagine a research university that doesn’t have doctoral education as one of its key missions. That’s not negotiable. Also not negotiable is that we do a great job of it. I don’t think we have to belabor that point.

“Second, what we do have to face, though, is that doctoral education is under considerable pressure nationally, and here, too, for multiple reasons. Not all of them are negative. There have been changes in our disciplines, our interdisciplinary challenges, our departmental management of graduate
programs and our doctoral programs. We have yet to figure out the impact the technological revolution in higher education is going to have on doctoral education. There is an extraordinary transformation that’s taken place in discussions about undergraduate education and the focus on student learning. We have to begin to think through what that means for doctoral education. In addition, there’s the problem with the job market; that’s a major concern for our graduate students and it should be a major concern for us as well.

“I’ve been thinking through the impact of the radical contraction of job market in the arts and humanities in the wake of the 2008 crisis. That’s led me down various roads. I’ve learned that there are some discussion points that are shared across the diverse range of doctoral programs in this university. There’s not one single program, there’s not one single agenda, but there are interesting echoes across the university. What we want to do today is tease some of them out.

“What I’d like to do is name five leading points and ask each of the panelists to make some comments about them from his or her perspective.

“The first point is the growing recognition of the breadth of career outcomes of a doctorate. The PhD opens many different doors. For some of you in the sciences this may be old news; for some of us in the humanities, this is brand new news. A lot of what I’m going to say today is the consequence of the recognition of the diversity of career outcomes.

“The second point is that not everybody recognizes that diversity. Not everybody recognizes that a PhD can lead in all sorts of different directions. Let me put it cautiously: for many graduate students there is the perception that faculty mentors look at certain kinds of outcomes with disdain. And they’re afraid to talk about them with their faculty members. They’ll go to events by the Career Development Center (CDC) and to discussions about alternative academic careers, but they don’t want their faculty mentors to know. It’s a real cultural issue that in some sectors we faculty have to address.

“Thirdly, against this background of recognition of a broadening career horizon, we have to think through — and this is more on a departmental level — the internal structure of what our programs are about. Are we preparing our students appropriately for the career options they will face? Graduate education should be about graduate student learning needs and their career development needs. I’d like us to ask, department to department, is everything we’re doing appropriate for those goals or are we doing things just because that’s the way it’s always been done? And do we see things differently? In the context of that internal assessment of our programs, issues like examination structure, seminar structure, time-to-degree, and time-to-attrition would all come up. I think it’s the time-to-degree that is really important but it’s not that alone.

“Fourthly, recognizing this broadened career horizon—that the PhD is not exclusively about replicating the faculty—we have to ask, to what extent do we provide appropriately broadened professional development opportunities for our graduate students? I think we do a lot at Stanford. Some of it’s done through the office of the Vice Provost for Graduate Education (VPGE); some is done elsewhere. In curriculum matters, some of it is done in departments. We should ask, ‘Are we doing enough of that? Are we doing it appropriately? What are the ways to think through the core of our programs, where we could target more competency development, so that students would go on to
job markets with skill sets that can be transferable, usable within the academy and outside the academy?

“My last and fifth point is crucial. Some of our graduate students are going on unexpected career tracks. I know this by anecdote, but we need hard data. We need to be able to track this and we don’t do a good job of it. We want to know not where students are at their first placement, not where they are two or three years out, [but] where they are ten years and fifteen years out, and we want to know to what extent they are building on the skill sets they developed in graduate education. This is something that is beyond us at this point. We can try to count heads, go online, and find out where people are, but what we haven’t been able to do is survey them robustly to get their testimonies about what they did here and how useful — or not useful—it has been for them ten years out.”

Professor Satz took over. “OK. This is the department of redundancy department—

[ Laughter ]

“I agree with everything Russell said. One thing I would underscore is that I feel some urgency about having a discussion and deliberating about this subject because, given the job data, there’s a lot of criticism of higher education [of] being irresponsible. While this may not be directed at Stanford, we need to be part of the discussion and be clear about the value of the PhD and about the fact that our students with PhDs do go outside of academia and have good lives.

“I’m going to provide one point of data to frame this and then give you an example that brings out some of the issues in the Humanities.

“The School of Humanities and Sciences conducted a study of the class of 2002 to see, ten years out, what the class was doing. We found that between 50-60% of our PhDs were in academic jobs. We couldn’t find where a lot of the others were. We need to do more research to know whether we are serving those students well and how satisfied they are with their training; did we prepare them as best we could?

“A lot of our students are confused; they come here enthusiastic but they’re afraid because they know the job market data and don’t know what to do. We could do a better job in the Humanities of saying to them at the beginning that there are a lot of things one could do with a PhD in Philosophy or History. There’s more than one career path. The fact that we don’t do that has some negative consequences. The students are confused because we’re not telling them the truth about the job market.

“Secondly, we sometimes lead them into narrow career paths for academia that don’t serve them well, rather than help them develop skills that they could transport to other places.

“I want to give an example that shows students are hungry for these discussions about other career paths. I’ve put out a call for a focus group for Humanities PhD students to talk about other career paths in education that would not involve university or college teaching, but rather high school teaching. I assumed that a lot of our students love to teach but may decide that academic teaching is either not right for them or they won’t be able to find academic placements. I know our society
needs really good teachers and that our students are really good. Nearly 100 students answered the call, saying that they were very interested in this career path. About 40 students came to a focus group meeting, the theme of which was, ‘Credible enthusiasm about thinking about this as an option.’ But a lot of students said, ‘Whatever you do, whatever programs you develop, please don’t have it noted on my transcript because I don’t want my advisor to know that I’m thinking about this.’ I think that is a misperception because many of us do endorse [alternative pathways] as valuable careers. But that’s not the message the students were getting. They need to get the message that the faculty values these career paths.

“Next year we are launching a new course co-taught by Pam Grossman in Education, and Jennifer Summit in English, entitled, ‘An Introduction to Humanities Students About Teaching at High Schools.’ It will involve curriculum issues but it will also have students visit high schools to learn about high school teaching. We’re working with the Haas Center to develop placements for them so they get experience working with young people to see if they’re good at it. The school has agreed to fund their degree for all our students who finish their PhDs and get admitted to Stanford’s STEP [Stanford Teacher Education Program]. This is a pilot program, but is an example of an incredibly valuable career path and it’s the kind of thing, judging by the response, that students are hungry for. Once we start thinking more deliberately about career paths, the questions Russell raised are going to be important questions: What’s the right time to introduce this kind of option to students? If it’s at Day One and you’re concerned with time-to-degree, do you load students to start thinking about extra options? How do we do this? How do we know that we’re serving our students well?

“To underscore that there are two parts of this process, there’s the data part: we need to know what is actually happening to our students. And there’s a normative part, which is to have discussions among ourselves and with our students about what the PhD is for.”

Dean Plummer was the next speaker. “The overall picture in the School of Engineering is that we are happy with the state of our current PhD program. It’s a large program; we graduate more than one PhD student per faculty member per year across the School of Engineering. All of our students get interesting job offers and go on to various careers, although we don’t have data other than anecdotal data.

“The School of Engineering is quite different than other parts of Stanford because only 20% of our PhDs go on to academic careers. It’s higher in some parts of the School of Engineering; that’s the overall school average. The vast majority, 80%, get positions in industry, or the national labs, primarily industry. That’s probably not surprising, given where we are and the opportunities that exist in Silicon Valley.

“It’s also interesting to point out that if you asked individual faculty in the School of Engineering whether the jobs that their students took in Silicon Valley, after they got their PhD, really required the PhD degree, I think they would say, ‘Well, perhaps not’ in many cases, because they take jobs which, arguably, they could have gotten, probably at a lower salary with a masters degree and maybe a little more experience beyond that. So then you have to ask—are we doing a disservice to our students by holding on to them for five years when they’re getting jobs they might get without the PhD degree? But the anecdotal evidence is that students truly value the time they spent here in the PhD programs because they know a lot beyond the specific job skills as part of that program. We
believe there’s huge value in the PhD degree for our students, even if they go do work in industry, even if they take a job that doesn’t specifically require the skills they might have learned as PhD students.

“We actually have the opposite problem to the one that exists in many parts of the university: too few of our students want to go on to academic careers. I can speak from personal experience — and many of my colleagues can as well—that the vast majority of our students don’t even consider academic careers, because it’s too hard, ‘because I don’t want to be like you.’

[ Laughter ]

“But probably more importantly [they chose non-academic jobs because] the job opportunities in the Valley are so interesting, including the opportunities either to start companies, or be involved in new projects.”

“Another point— and this is true in many areas of science as well—the half-life of the information that students learn as part of their education is really only three to five years, in engineering. So obviously [getting a PhD] is not about learning specific technical skills or information, it’s about learning a set of skills that are going to serve you well throughout your career. Many of us are strong believers in PhD students doing something other than being deep divers in the particular discipline in which they get their degree. We’d like to see them walk out of here with a much broader set of skills to serve them throughout their career.

“Let me mention two issues we are a little concerned about. The first is—and this is kind of a two-edged sword—more than half of our PhD students are foreign students. The positive side is that, in a very real sense, the School of Engineering is a conduit for bringing the best and brightest students from around the world, educating them at Stanford, and then almost all of them stay in this country. If you go to a technical meeting in the Valley, you’ll notice that half the people in the room are immigrants. These are the people who have started the companies and are creating the technologies that are important to all of us here and around the world. The flip side is that, as the opportunities in their home countries improve—and they certainly will—fewer of these students are likely to come here. As a ‘pipeline issue,’ with respect to the numbers of US students interested in pursuing these graduate degrees, this is a long-term concern for us. We’re working on a number of programs to try to improve the pipeline of students through high schools and undergraduate careers to the graduate programs here and around the country to increase the percentages of US students who pursue graduate degrees in engineering.

“The second concern is about the increasing trends essentially to replace PhD students with postdocs. In the engineering discipline, arguably only those students going on to academic careers really need to have a postdoc position. Even that is debatable; most of the faculty we hire in the School of Engineering don’t. But more importantly, in a very real sense, replacing graduate students with postdocs does a real disservice to the aggregate numbers of students we could educate in our graduate programs. I believe, and many people believe, that this country would be better served if there were larger numbers of students getting graduate degrees in the sciences and engineering; so the degree to which we’re reducing the aggregate numbers by effectively replacing PhD students by postdocs is a concern.
“The total number of postdocs is not nearly as large in engineering as it is in some of the life sciences—and the situation is clearly different in the life sciences than it is in engineering—but the numbers are rapidly rising, if, for no other reason, than the cost of a postdoc is cheaper than the cost of a PhD student.

“As I said in the beginning, in the aggregate, we think our PhD programs are in quite good shape and we’re pretty happy with the quality and the output of the program.”

The fourth person to speak was Professor Ober. “Just a couple of disclaimers to start with. I’m not a dean, I’m a department chair, so I’m going to give you a snapshot of the piece of social science I know about, which is the PoliSci Department. The other is that I am here supposedly to talk as a social scientist, not as a classicist, so it’s not double dipping in the Humanities side. From the PoliSci perspective, I’m somewhere in the middle between these two positions—maybe like Goldilocks, or a middle child position.”

[ Laughter ]

“Over the last eight years, we’ve seen increasing numbers of graduate or potential graduate students applying to our PhD program—it’s up about 40%. We had a relatively stable number of admissions, about the same number of students entering the program each year, but we’re having higher yields on our offers, meaning that we’re getting more selective. In terms of the total numbers of student that we matriculate, we are down to about 4% of total admits. We suppose that the ones that we admit, based on the standard modes of assessment, are the cream of the crop. What I don’t know is whether the 15-18 students who join our PhD program each year have different career aspirations for their post-PhD career trajectories and whether they have different trajectories than the 96% of applicants in Political Science that don’t come to Stanford. This is a repeated drumbeat calling for more data.

“Currently we’re not having a lot of problems with placement. Virtually all of our students get jobs that use the skills they learned in our program, although sometimes it takes students a couple of years to land the job they’re looking for. We don’t keep very good records, but something like half go on to regular academic jobs in research-one [top] universities; the other half go into teaching universities, think tanks, research organizations or government. A few take postdocs before they find regular jobs, but that’s relatively rare compared to other fields, especially the natural sciences. Like others on the panel, I’d like to get a better sense of why students seek admission to our PhD program in the first place. We have intuitions but don’t really know. I’d also like to know how their thinking evolves during the years they’re in the PhD program and what they think about the value of their PhD programs once they’re done. I think those questions are answerable and there’s a lot of expertise at the university and elsewhere in running the longitudinal studies necessary to answer them.

“I’d like to have a better sense of how current and potential PhD students rank the various career paths, academic and otherwise, available to them. The best I can do is to ask our excellent and very empathetic student services manager, who keeps close touch with individual graduate students during their years at Stanford. Chandelle Arambula says that, ‘Students are definitely hesitant to
make it known that they aren’t considering an academic career, but I don’t get the sense the faculty think students have made a mistake if they don’t stay in the academy. My impression is that such thinking is more common in other departments. It’s my understanding that elsewhere within Stanford students have to go outside their home departments to get proper mentoring on non-academic jobs, and this seems to be on the sly.’

“In Political Science there seems to be enough exiting connections to think tanks, research centers and so on, such that it’s not too hard to acquire a different perspective of what to do with a PhD. More importantly, there seems to be more acceptance within the department of non-academic career paths.

“This is completely anecdotal, but it does point to the need to get more accurate university funded data that will allow us to track and respond to evolving student career ambitions to know what they hope for, see how that’s changing over time, and therefore be able to make adjustments in how we design PhD programs that can best serve them as well as best serve society as a whole.”

Professor Simoni took over. “I’m from the Biology Department and only represent the department but, as many of you know, we’re part of a much larger organization called the Biosciences Program that includes not only Biology from the School of Humanities and Sciences but the Medical School degree granting units as well. Many of the things we do, we do collaboratively.

“To look to the future, you need to know where you stand now. I think we have an exceedingly strong, vibrant PhD program. We have very large applicant pools that have increased 25% in the last five years to about 500. We admit about 50 or 60 and get a yield of about 50 or 60%. We lose them to only the best places.”

From the floor, “Don’t you mean only the second-best places?”

Professor Simoni [chuckling] “Only the second-best places, thank you.”

[ Laughter ]

[They include:] “UCSF, Berkeley, MIT, Harvard; we compete with each other for the very best students. About 85-90% of our students complete the PhD; they go on and get jobs. If you look ten years beyond the postdoc level, which is a tradition in the life sciences, there are still about 80% doing research-related activities in an academic setting, government, or industry. This has been a big transition in the life sciences over the 35 years that I’ve been watching it. The mix has always been there but the balance is shifting. Even within academic positions the balance has shifted: primarily research universities are out and four-year degree undergraduate institutions are in. I think that the fact that our students are going into those positions serves them and those institutions and the country quite well.

“In sum, we get great PhD students, we train them well, they get great jobs, and they may become leaders in their fields. By those criteria, which I think are the most critical, we’re successful at what we do.
“Looking to the future, there are challenges. One is cost. The cost to train a student is high and in some respects is shifting. In the life sciences the cost traditionally has had a big federal component, especially from NIH but also from the NSF. That’s been fading. Were it not for the university administration, the Provost, Patti Gumport [VPGE], and Richard Saller [Dean, H&S], we would not have been able to sustain our program at a critical level without our institution coming up with compensatory support for loss of federal funds. It would be naive to think the slide is not going to continue. We’re at a bad moment and I think the forecast for the future is not optimistic. The real question is—what do we do about support, going forward? Do we need new models of how we support graduates? One colleague suggested to me that when she was a graduate student she had to pay her own way through graduate school. That’s a pretty grim prospect for any of our students, to say nothing of the issue of growing student debt. But it’s something important to think about.

“The second thing I wanted to talk about is time-to-degree. This is a simple term that means something more complicated, which is—what is an optimal training experience for an individual graduate student? Our students come here, they get their PhD, a vast majority go on to a postdoc position—that’s Phase II of training—and then they go on to a more permanent kind of position.

“As a department—and this is probably true beyond our department—we think that students can extract just so much from a particular environment; staying beyond that optimum time does not serve the student well. We’ve begun to focus on trying to optimize the time they spend getting their degree. One of the consequences will be to shorten the time-to-degree. The time-to-degree in our department, for which I have good data, and Patti [Gumport] also has some data, has extended about one year in the past twenty years. Students are hanging around longer for many reasons. What can we do about it? We’ve started to do a variety of things.

“The best correlation with time-to-finish is the time students start on their thesis project. So the trick, in our judgment, is to get them started on their thesis project, most often in a laboratory, as soon as possible. That means moving up other stuff. They do lab rotations to decide where they’re going to do a thesis project; they take courses; and they do teaching. These are integral parts of their training but we’ve moved that to earlier in their time. The hope is that by the end of their second quarter they will have chosen a thesis lab and gotten started on their thesis work. We’ve also moved up the time of the qualifying exam. The result will be, we think, shorter time-to-degree, and more importantly, more optimal training experience.

“We’ve also been working on the curriculum that we share with the Medical School. It serves us and our students exceedingly well. We have tried to break out of the quarter-time unit. We’re now offering courses called micro courses or mini courses the students can take then for two, three, four or five weeks. The unit of course time is much smaller and allows them to do more in a single quarter. It doesn’t mean the time spent in a course is any less; it’s just more focused and more concentrated, and it gives a lot of flexibility.

“All those things that I mentioned are carrots, but there’s also a stick in this formula, which is to limit the amount of financial support students can receive. It’s been our tradition, and that in the life sciences broadly, that we review student support on an annual basis. If they’re making good progress towards their degree their support is renewed. Sometimes it’s renewed and renewed and goes on for probably too long. Within the department of Biology—this is not true yet of the Medical School—
student support will be limited to 5.5 years. This may not sound draconian to the rest of you for which 5.5 years would seem to be quite generous. But the limit of support means any source, not just from the department but from faculty research grants as well. This involved getting the department faculty to agree on how they would use their own research grant money.

“This is a tricky thing. It’s not even clear it’s a wise thing, to be honest. Faculty are the best judge of how to use their own money. In the end it was not unanimous but a substantial majority of the faculty agreed to limit support from their research grants to 5 and a half years total. We have a process for making exceptions and so on. The two years that this has been in effect seems to be working reasonably well but the sample size is still small.

“This is not novel with us. Our competitors at Berkeley have been doing this for probably fifteen years. We had hoped that it would make them less competitive, but it has not done that. Nor do we think it will damage our competitiveness for students, either.

“The last thing is the issue of diversity. It pervades all of these issues. I think we’re doing better if we work quite hard on it and with help and support from Patti, I think we’re doing a better job.”

The last speaker was Professor Herschlag. “We talk about jobs in academia and alternative careers. What we’re trying to do in the School of Medicine is tell our students even before they start that they should be seeking the career of their choice. Those words matter to the students—that there’s not one pathway. That career of choice should be not just training for existing jobs, but finding new pathways and new opportunities, which Stanford graduates are so great at doing.

“In terms of the training, we need to think about whether we are teaching our students research skills so that they can do what we do, or are we teaching them to find important questions and try to answer those questions. In the sciences we’d brand this as ‘thinking like a scientist.’ I’d like to say one thing that’s controversial: In the Life Sciences, at least, undergraduate training not only does not do a good job of preparing students for graduate work, but also, in essence, if undergraduates were to follow everything they’ve learned 95% of the time and therefore not take risks, they would fail as graduate students. So part of our new curriculum is to try to put in place radically different models that are more interactive, more collaborative, and that involve hands-on problem solving that’s distinct from what they get as undergraduates.

“Finally, to echo and amplify that we’re all saying we’re doing great jobs—you shouldn’t believe us. We need data and that data can’t come from one study done by somebody. We need data that are available to all of us, that are tracking all our students over time. Maybe this is a problem because we’re in Silicon Valley; nobody knows how to collect data in Silicon Valley. I think it’s a real shame and missed opportunity over time; one that should be addressed right away.”

That ended the presentations by the panelists.

**Question and Answer Period**

Chair Levitt opened the floor for questions.
Professor Renee Reijo Pera, Professor in Stem Cell and Regenerative Medicine asked, “I’ve been curious when people talked about success rates of 80%, etc. It seems to me there’s a well-recognized problem that women actually drop out of research careers, perhaps at a greater rate. Is the 80% across the board and is there a group that are dropping out more frequently than other groups?”

Professor Herschlag replied, “We can take the numbers in the life sciences at least from national studies regarding the PhD [statistics], but it’s at the postdoc and especially the faculty level where the drop-off in data occur. And that’s an enormously important and difficult problem. One issue is that the tenure cycle does not work very well with the biological cycle, so one radical way to deal with that is to get rid of tenure.”

Professor Reijo Pera continued, “I think that women or some minorities may feel they are not being well-served by the PhD; they exit the PhD and then move to something different. I don’t know that for a fact although I do see it anecdotally, and it might be good to follow up on that.”

Professor Simoni commented, “I think that would be another one of the bad points.”

Professor Margaret Fuller of Developmental Biology noted, “I think there’s a very important dynamic tension between the two last points—the shortening the time-to-degree and encouraging students to take risks and do new pioneering things. We have to be very careful not to lose the adventurous creative opportunity that our postdocs don’t have time to take but our grad students do. They should be encouraged to go across disciplines and across training programs, [but may be discouraged to so if we say], ‘OK, you’ve got to be out in five and a half years.’ We have to be really careful about that.”

Professor Andrea Goldsmith of Electrical Engineering observed, “I think getting a PhD is not so much about career preparation, it’s about an education. It’s a different education than that of an undergraduate. It’s a broadening of horizons, a way to think about things that transcend engineering, science, and humanities. I think it would be unfortunate if our PhD programs focused more on career preparation or saying, ‘These are the careers that are open to you’, because there’s an infinite number of careers that are open to someone with a PhD. I was part of the Commission on Graduate Education several years ago, which looked at these broad issues and at the PhD as an educational matter, just like what you do in your undergraduate education. I would worry a lot about our PhD programs going down the path of asking how we prepare students for their careers instead of asking what the right education is that we want our PhD students to come out of Stanford with, that is, put our own Stanford brand on a PhD from Stanford, regardless of career.”

Professor Herschlag responded, “I think many of us have had exactly that same perspective. What happens, however, is that students don’t know that the education they’re getting broadly prepares them for those careers. So the first point is to tell them, in essence, ‘Don’t worry, what you’re doing is going to prepare you.’ And the second point is to emphasize that the skills they learn, which are sometimes referred to as academic and professional skills, are one and the same. We hear over and over again from students who’ve done all sorts of things that what they learned as graduate students has prepared them and is something they use everyday. So it’s not necessarily to emphasize they’re getting vocational training in those opportunities but to allay their fears and encourage them to be more adventurous in their explorations.”
Professor Friedrich Prinz, Chair of Mechanical Engineering, commented: “I think it’s important that we prepare students with a balance, in terms of the breadth of experience that comes from a lifetime, but equally important, teach them certain skills to get started in the job, because that’s what can influence them the most. When we try to prepare a student to interview for a faculty position, the recent discoveries matter very much to whether the student gets or doesn’t get the job, or whether the idea which the student has to come up with helps him start a company. I agree that if we look ten years down the road, what skill sets really help them is an important question, but equally important is the specific starting point. Do we teach them the right skills to be optimal in a position when they set out? It’s the balance between the questions. Not only the lifetime experience but also the specific starting point of skills—we need to ask a spectrum of questions to get the right feedback.”

Professor Berman said, “I think Andrea’s point is absolute. People go into doctoral programs because they have passion about the material and intellectual curiosity, but they’re also at an age when they have to begin to move into a career, and the double character of the program is inescapable. One has the impression that in some sectors of the university there’s less attention paid to equipping the students with the ability to negotiate the changing job market. That doesn’t mean ratcheting back on intellectual passion, but it means building bridges to places where we, my generation of faculty, never imagined that graduate students would go. It’s that kind of culture change that we’re facing in different ways in different parts of the university.”

Chair Levitt, summing up, “This is obviously a very important question and one that all of us care passionately about. The 46th Senate will undoubtedly devote substantially more time than we were able to do today. I want to thank Russell for putting together the panel and thank the panel for their thoughtful and diverse comments. And this will be continued.”

Provost Etchemendy raised his hand, “Let the Vice Provost for Graduate Education have the final word.”

VPGE Patti Gumport responded, “I wanted to thank the panel for bringing these matters to the fore; these are critical conversations we need to be having. For the benefit of all the senators, I want to let you know that yesterday over forty directors of graduate studies met to talk about these precise issues. They’re committed to going back to their departments and having these important conversations as well as continuing to talk across departments. Thanks to all of you. We look forward to hearing more from the rest of the faculty.”

Chair Levitt asked VPGE Gumport, “Would it make sense to commission a survey to start now that would inform the discussions next year?”

VPGE Gumport answered carefully, “Certainly we can talk about that.”

[ Applause ]

VI. Unfinished Business
There was no unfinished business.
VII.  New Business
There was no new business.

VIII. Adjournment
A motion to adjourn was seconded and passed unanimously. The Senate adjourned the meeting at 4:10 PM to reconvene in Executive Session.

Respectfully submitted,

Rex L. Jamison, MD
Academic Secretary to the University
Professor of Medicine, Emeritus