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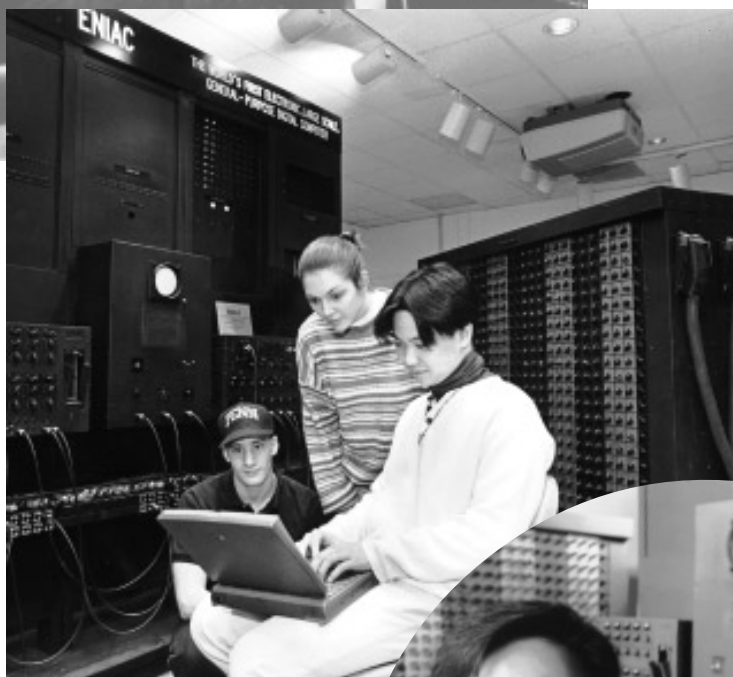


Fifty Years Smaller

In 1946, the 30-ton ENIAC took up a gymnasium-sized room (part of one wall is shown above). Even the portion of the original that is on display at SEAS (right), dwarfs the laptop computer of today. And the capacity of ENIAC, with its 18,000 vacuum tubes, has now been reproduced via 300,000 transistors in the tiny chip that can barely be seen on the student's forefinger (lower right photo).

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Upper photograph from the
University of Pennsylvania Archives
Center and lower photographs
by Mark Garvin

Countdown to February 14

...please see pages 10-13

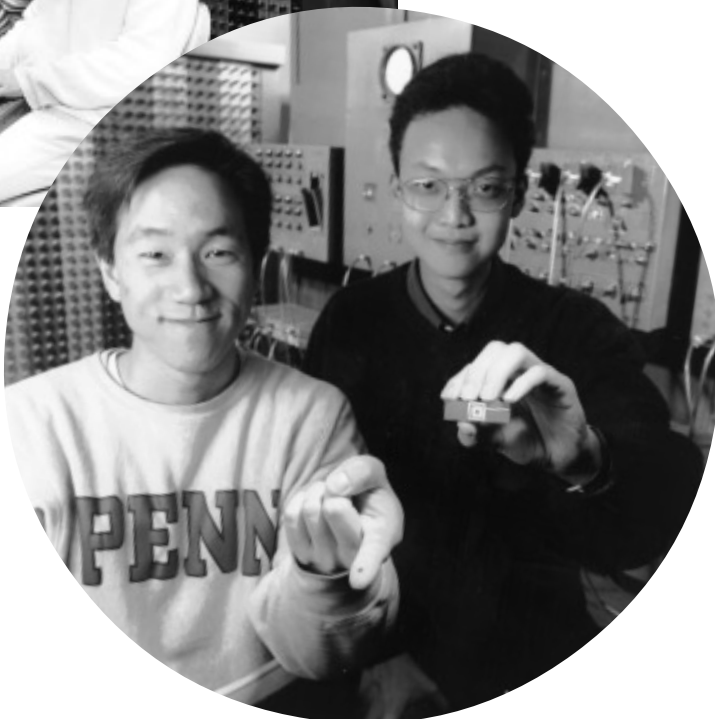
ENIAC 50

The Birth
of the Information Age

Above: Two of the women who worked on ENIAC, Frances Bilas and Elizebeth Jennings, with a portion of the giant "electronic brain" of 1946.

Center: Undergraduate students Roger Wallace, Jenni Marquiss and Jesse Leung with surviving ENIAC components and a laptop computer.

Below: James Au and Lin Ping Ang with test models of the chip they designed, replicating the architecture and capacity of ENIAC as a teaching tool. (See pages 12-13 for more on their project.)



Transition at Vice Provost ISC: Dr. Patton to Dr. O'Donnell

Dear Colleagues:

Effective March 1, 1996, Professor James J. O'Donnell of Classical Studies will assume the position of interim Vice Provost for Information Systems and Computing, reporting to the Provost and to the Executive Vice President. Professor O'Donnell is well known at Penn and around the nation for his innovative use of information technology in teaching and research, and has recently co-chaired the University-wide Task Force to Restructure Computing Services Across Penn.

Professor O'Donnell succeeds Dr. Peter C. Patton, whose five-year commitment as Vice Provost for Information Systems and Computing ends this spring. Under Peter's leadership, the University consolidated academic and administrative mainframes; launched Project Cornerstone, a multi-year effort to re-engineer business processes, design a new information architecture, and deploy a new financial management system; developed ResNet, a five-year program to network all residence halls for data, voice and video; and rolled out numerous services. Most recently he has co-chaired with Dr. O'Donnell the restructuring Task Force.

A search committee for a permanent Vice Provost will be formed shortly. We are committed to maintaining the momentum of our major programs and investments, and to carrying out the recommendations of the Task Force. As Task Force co-chair, Jim O'Donnell is ideally qualified to carry us forward.

Dr. Patton, who will continue at Penn as Adjunct Professor of Computer Science and Lecturer in Mathematics, was recruited to Penn in 1991 from a consulting practice in which his clients included the National Technology Transfer Center and Jet Propulsion Laboratory. Previously he was founding director of the Minnesota Supercomputer Institute; director of computing at the University of Minnesota; and a manager and engineer in several companies in the U.S. and Europe. Peter has also consulted widely around the world. He is currently in discussion with several organizations focused on research and advanced technology.

We would like to take this opportunity to thank Dr. Patton for his service to the University and for leading Penn to a position of leadership among research universities. We also thank Dr. O'Donnell for his willingness to work with us, with the ISC staff, and with the University community to ensure that Penn is well positioned for teaching, research, and administration in the 21st century.

— Stanley Chodorow, Provost
— John A. Fry, Executive Vice President

Ed. Note: For more on Dr. O'Donnell, a leader in the exploration of Internet technology for teaching, please see his home page on the Penn Web, <http://ccat.sas.upenn.edu/jod/jod.html>.



Dr. Patton



Dr. O'Donnell

Brownlee Term Chair: Dr. Ann Matter

Dr. E. Ann Matter, professor and chair of religious studies, has been named the first R. Jean Brownlee Endowed Term Professor in the School of Arts and Sciences. Dean Rosemary Stevens announced this week as a fitting recognition for Dr. Matter's "commitment and years of achievement at Penn."

The Brownlee chair is named for the late Dean of the College for Women, who died just over a year ago. It was established through a gift of the McLean Contributionship under the direction of Mr. and Mrs. William McLean, III, in recognition of Dean Brownlee's years of service as a trustee of that organization—a successor to the Bulletin Contributionship—and their lifelong friendship with her.

Dr. Matter is a Lindback Award-winning teacher and a widely published scholar whose work encompasses both the history of the interpretation of the Bible from the Middle Ages to the present, and studies of women in early modern Italy. Her most recent books include two from the University of Pennsylvania Press, *The Voice of My Beloved: The Song of Songs in Western Medieval Christianity* (1990), and *Creative Women in Medieval and Early Modern Italy* (edited with John Coakley, 1994). She is also known for her critical edition of Paschasii Radiberti's *De partu Virginis* (1985) and is the author of some 40 articles and chapters in journals and books published here and abroad.

A 1971 alumna of Oberlin College, Dr. Matter took both M.Phil. and M.A. degrees at Yale in 1975, and her Ph.D. there a year later. She joined Penn in 1976 as an assistant professor, became associate professor in 1982, and was promoted to full professor in 1990.

She has just been named a Guggenheim Fellow this year, and the award will be used to continue her work in glosses on the Bible. Among her other prizes have been Yale's Whiting Fellowship for the Humanities, 1975-76, and two National Endowment for the Humanities Research Fellowships, held in 1979 and 1988. Dr. Matter received the Lindback Award for Distinguished Teaching in 1981. Later she served as president of the Lindback Society as it was revived after a long period of inactivity.

Another major assignment Dr. Matter held at Penn was to direct the Women's Studies Program in 1981-83—and during that time to interview, for the Program's Oral History Project, two women who helped shape women's presence at the University: Dr. Althea Hottel and Dr. R. Jean Brownlee. "The Brownlee Chair means all the more to me because of that," said Dr. Matter.

SENATE From the Senate Office

The following agenda is published in accordance with the Faculty Senate Rules. Questions may be directed to Carolyn Burdon either by telephone at 898-6943 or by e-mail at burdon@pobox.upenn.edu.

Agenda of the Senate Executive Committee Meeting Wednesday, February 7, 1996 3-5:30 p.m.

1. Approval of the minutes of December 13, 1995
2. Chair's Report
3. Report on activities of the Academic Planning and Budget Committee and on the Capital Council
4. Selection of Senate Committee on Committees from continuing SEC members
5. Committee on the Faculty Statement on School of Arts and Sciences Proposed Lecturer and Senior Lecturer in Foreign Languages
6. Informal discussion with the President and Provost on the relationship between the Strategic Plan and the 21st Century Undergraduate Education effort
7. Other new business
8. Adjournment by 5:30 p.m.

Ed Note: Please see pages 5-7 for a report of the Economic Status committee.

Correction: *Almanac* was inadvertently supplied with an uncorrected manuscript of the short history of ENIAC published last week on pages 4-7. A complete substitution has been made in both electronic versions of the issue (HTML and Acrobat), which can be found on the Penn Web at <http://www.upenn.edu/almanac>.

Council: The January Dialogue on ROTC

At Council on January 17, the Provost's report included a statement on the current status of negotiations toward an "arm's-length" relationship with the ROTC. This led to the exchange below with Dr. Larry Gross, professor of communication at the Annenberg School of Communication.

Dr. Chodorow: ROTC was an issue that came up apparently last time [November 29] when I was away, and I have been asked to comment on it now.

At that meeting, it was reported that I had met with the Secretary of the Navy and that he had made it clear he was not much interested in pursuing the arm's-length arrangement we are seeking. It's true that is the position that he expressed at that meeting—not as a formal decision, but certainly it becomes the basis upon which further negotiations, if any, would take place in the near future with the Navy.

However, the Navy is only one of the ROTC programs, and my conversations with the Army have been continuing—I have recently had a meeting with the regional commanders; those conversations are open and ongoing, and they could turn out to be productive.

One of the things I've learned is that the Pentagon is not only a complicated place, but a place where things change. Last summer when I was pursuing a discussion with the national leadership of ROTC, the day before I was supposed to meet them the command changed—all new characters. It took them about two months to appoint a new national director; and the regional officers rotate out in a very short time.

But conversations with the Army continue, and I suppose the most important thing about dealing with the Pentagon and with the Defense Department is just don't give up. And I can report that we are not giving up. I hope that I will be able to report later this year on how those conversations with the Army are turning out and whether in fact we've had any further conversations with the Navy.

I think it is important to keep in mind, by the way, that this is a two-sided discussion. The President and I were in effect instructed by Council at the very beginning of our tenure here not to make a unilateral decision, and we are not. We are in negotiations with a partner, in fact with more than one partner; and that is complicated. For that you need persistence, and that's what we are trying to give it.

Dr. Gross: I was unfortunately not here at the last meeting when this was discussed in open forum, but then neither was the Provost, so we're in the same situation. I originally introduced a resolution in Council in the spring of 1990 requesting that the University end its relationship with ROTC after a certain period, if the continuing violation of the University's adopted principles continues.

There has been a long and somewhat tortuous history since then. That resolution was passed unanimously, supported both by the President and Provost at that time. Later, in an attempt to avoid, in effect, the direct implications of that resolution, the issue was referred to the Senate Committee on Conduct to look into the question of whether in fact discrimination was occurring. That committee subsequently reported that yes, discrimination was occurring and it once again came back to Council, which urged that the original resolution be acted on.

The next stage involved another com-

mittee...which came back with a somewhat more complex proposal, but the bottom line as I understand it has continued to be that the University should not tolerate a situation in which its self-proclaimed policies are being violated.

And I would ask the question, "Which, or how many, of our policies are we willing to countenance violation of in order to achieve other ends?" I think it's a very interesting and important question for us to ask. When this issue has come before University Council or other bodies, the answer has always been that we should not continue to countenance a violation of our policies.

Obviously there are reasons, and not incon-siderable ones, why we do not wish to end the benefits that ROTC provides, which is where the arm's-length type of compromise came in. But my understanding has been that Council has repeatedly expressed, [as have] other bodies concerned, that the University should not willingly or through delayed, tardy, slow inaction, permit this sort of violation of our principles.

I assume, somewhere, you have a complete, very large file of all this. I would draw your attention to one document in that file that might be useful in the present circumstances. This is a letter written in April of 1990, by then-Provost John Deutch of M.I.T. to then-Secretary of Defense Dick Cheney, in which Deutch expresses his belief that the ROTC policy is wrong and shortsighted, as he expresses his belief that the military policy is wrong and shortsighted, and his belief that the DOD should reverse this discriminatory policy just as it has prior discriminatory policies against blacks and women. He goes on to argue quite cogently why he believes the DOD policy should change, and the dangers both to the Department of Defense and to the academic establishment if this does not happen.

Given that then-Provost Deutch has since been made Deputy Secretary of Defense and is now Director of Central Intelligence: As my sociologist colleagues like to say, position is perspective, so unless he has completely forgotten, he might be called upon as someone who still has ties with the academic community to raise some of these issues within the present discussions.

But I think the basic point is that after a while (and this is not a new experience, but an experience that has occurred whenever institutions have confronted institutionalized discrimination) the process of endless delay, of hair-splitting, and of shifting the terms—so that you're constantly being pushed in one direction or another—ultimately does not change the situation.

I think the University cannot endlessly avoid having to confront the question of whether or not it stands behind the principles that it proclaims it adopts.

And I would very much not wish us to reach the end of another academic year with another dangling question of "We'll get back to it," and "We'll continue to talk." That would really be, among other things, a demonstration that discussions and resolutions in Council are ultimately not an effective way for this University to face

policy issues, because Council has spoken on this numerous times. Thank you.

Dr. Chodorow: Let me say that I hear you, and that when we got here, and this issue became ours, the vote in Council was described as equivocal, in that Council accepted most of the recommendations of the committee that had made its report just as we were arriving, and rejected a critical part of that recommendation. And I've been operating in response to that vote. Beyond that I would say that some of this is a discussion of strategy: How do you accomplish this? I take your point that after enough time has passed, it proves a strategy right or wrong. I hope that we can in fact bring closure to this very shortly. But I hear you.

Dr. Gross: There is a certain pattern, in fact you may recall William Penn's experience with the British law, where you can keep going back until you get the answer you want. It seems to me that Council, the Committee on Conduct, and other bodies have consistently taken the position that the University should not countenance violating its principles. There is history of that last discussion of the report, a complicated history of who was or was not at a critical meeting of that committee, which is why the report took the form it did. But the fact is that the basic principle has always been maintained, which is that there is a serious challenge to the University's commitment to its own principles, and that needs to be addressed—not to take refuge in one of many discussions in Council might have said or not said.

The principle has never been simply end-all, we have tried to salvage the good in the situation. But ultimately, if it cannot be salvaged except at the cost of the University's principles, it is my reading, at least, of a number of discussions in a number of venues, that the implications of that is that the University has to decide whether or not it means what it says in its policies.

Honor Council for 1996

Last July, Provost Stanley Chodorow announced the establishment of a student Honor Council of 13 undergraduates to advise him on matters pertaining to academic integrity, and to "strive to promote academic honesty throughout the University" (*Almanac* July 18). New members and a new chair have been selected for the year 1996. They are:

Justin Shellaway, *Chair*, Col '97
Damon Clemow, Col '97
Steven Friedman, Col '98
Sarah Garlinghouse, Col '98
Mark Hershenson, Col '99
Katherine Koppman, Col '97
Miriam Levitin, Wh '97
Jordan Matusow, Col '98
Daniel Orr, Col '98
Christina Park, Col '98
Reid Schneider, Col '98
Jeffrey Snyder, Wh '99
Koy Thanaporn, EAS '96

Toward an Ivy League Greek System in the Twenty-first Century

Purpose: Greeks have a long and prosperous history at the University of Pennsylvania. The Greek experience has been an integral and vital part of thousands of Pennsylvania students' lives both before and after graduation. The Greek system at the University is over a hundred and fifty years old and over time it has amended its policies to address current issues and expanded its role within the University. As the University enters its next metamorphosis as it prepares for the twenty-first century, the Greek system seeks to meet the demands of history and progress at the same time.

This report delineates the Greek plan for the twenty-first century. It will outline a specific set of goals and policies that describe the history and current state of the Greek system and the direction Greeks hope to move in the next century. More specifically this report will describe a plan to bring the Greek system at the University of Pennsylvania in-line with the academic and community goals that the University and academia are pursuing as it enters the twenty-first century.

We hope that community members will be impressed not only by the sheer magnitude of the report's future-thinking and pursuit of meticulous detail, but also the efficient and thorough manner by which the report will be implemented. The Greek Report for the Twenty-first Century will be a forerunner in Greek planning for the twenty-first century—it truly outlines the plans for an "Ivy League Greek System."

About the Report: The Greek Committee on the Twenty-first Century will seek to develop a report that describes the history, present state, and future goals of the Greek system at the University of Pennsylvania as a whole. The report will also include individual sections for each umbrella organization to delineate their history as well as present and future plans that meet the ambitions of the Greek system and the University community as a whole. The Report outline:

- I. Committee Introduction and Report's Purpose
- II. Present accomplishments and brief history of the Greek System
- III. Overall goals and ambitions of the Greek system at Pennsylvania (i.e.: safety, multicultural programming, service, academics, mentoring, etc.)
- IV. Individual umbrella organization reports on its plans to reach not only the general Greek goals, but also goals more specific to its organizations.

- a. individual reports should include detailed histories, current membership demographics, and other organization-specific information (i.e.: academics, service, locations, etc.)
- b. the reports should also be very specific in changes that it plans to make in its effort to reach its goals (i.e.: new policies, etc.).

V. Report Conclusion

- a. conclusion should include an overall view of the future of the Greek system at Pennsylvania and the nation as well as the Office of Fraternity and Sorority Affairs role as we move into the twenty-first century.
- b. conclusion should also include a time-line for implementation.

The Committee: The central Committee on the Twenty-first Century (the group that will develop all sections except umbrella-specific sections) will consist of the presidents three Greek umbrella organizations at the University of Pennsylvania (the InterFraternity Council, the Panhellenic Council, and the Bi-Cultural Inter-Greek Council) as well as one additional member from each branch (preferably an executive board member or chapter president). The membership of satellite committees (those that construct umbrella-specific sections) will be determined by the individual umbrella organizations. All satellite committees will report to the central committee. Each satellite committee will appoint a chairperson to report to the central committee on a weekly basis (via report and presentations at the central committee meetings). One of the three umbrella Presidents will chair the central committee.

The central committee will meet at least once a week until both the preliminary and final report are released. The satellite committees will also meet at least once a week until the work is complete. The chairperson of the satellite committees must also attend central Committee meetings.

All committees will research, develop, and write their sections of the reports. All members must share in the workload. Feedback from all members is essential. It is encouraged that the satellite groups seek feedback from their umbrella members.

— Josh Gottheimer, President, IFC

Speaking Out

PFSNI: 'Get Serious' on Safety

In a recent article to the *Daily Pennsylvanian*, Geoffrey Peck from the Law School asks the administration to "get serious" about the problem of public safety and the issue of crime on and around the campus. I agree. Particularly those of us who live near, as well as work at, Penn have good cause to be alarmed by the robberies, muggings and murders that have recently taken place in University City and in the Powelton area. But how is safety to be provided? The standard solution—more policemen and retreat from a threatening urban world—seems to me to be not only shortsighted, but ultimately counterproductive. Jane Jacobs reminded us decades ago that safe neighborhoods were communities with an active street life, ones where local people, not only police, enforce the standards of civility that make high density living possible. Penn's policies on transportation, on mortgages, on real estate rental, on aid to local schools have far more impact on the public safety issue than does the number of police or blue light phones it puts on the local streets.

If you want to add your voice to discussions of University policy in West Philadel-

phia, I urge you to join the PFSNI (Penn Faculty and Staff for Neighborhood Issues) listserver. Particularly if you live in zip codes 19104, 19143, 19131, 19139, 19153 and would like to learn more about what is being—and what should be—done to improve the neighborhoods west of the Schuylkill River, e-mail listsrv@mec.sas.upenn.edu. Leave the subject heading blank, but include the message: *subscribe pfsni*. To send messages to the listserver, simply e-mail pfsni@mec.sas.upenn.edu. It's time for the residents to speak out for policies that help, rather than undermine, the quality of life in West Philadelphia.

—Lynn Hollen Lees,
Professor and Chair of History

'Visions' Under Wraps?

A visit to Meyerson Hall's main gallery will serve to reveal one of Penn's better kept secrets. I refer to the teaching and research tenure of a brilliant French Engineer/Artist/Sculptor/Poet, Robert le Ricolais. An exhibit of his work is on view there.

Already an honored scientist in his native country, le Ricolais came to Penn in 1954 to

further his research in the effects of stress on structure in space. While teaching architecture, he fabricated, with the help of his students, a number of physical models. These models demonstrate the application of his innovative research and are works of sculptural art in themselves. While reminiscent of Buckminster Fuller's creative ideas, they appear to go even further than the ubiquitous geodesic dome in exploring structural forms.

In 1974 le Ricolais was appointed to the Paul Philippe Cret Chair in Architecture at GSFA. He died in 1977 in Paris.

To learn more about le Ricolais's accomplishments as artist, poet, and philosopher, visit this mind-boggling assembly of his models. I'm sure you will come away enormously impressed.

For conceiving and mounting this exhibit, thanks should go to Professor Peter McCleary and his associates. The show will continue on view until February 12, 1996*.

— Maurice S. Burrison
Director, Faculty Club Art Gallery

* The date has been extended through February 16; for more on the show, please see the back cover of this issue.—Ed.

Speaking Out welcomes reader contributions. Short timely letters on University issues can be accepted Thursday noon for the following Tuesday's issue, subject to right-of-reply guidelines. Advance notice of intention to submit is appreciated.—Ed.

Fall 1995 Report of the Senate Committee on the Economic Status of the Faculty

January 25, 1996

Introduction

This report examines the economic status of the faculty of the University of Pennsylvania. We begin with a review of how salary decisions are made. We then compare Penn salaries and overall compensation with those of similar institutions, and with an absolute standard (the Consumer Price Index). We then examine evidence for inequalities of salaries within schools or broad disciplinary areas and what proportion of the faculty face cuts in pay measured in real dollars. The final two sections draw explicit conclusions from the evidence presented and make a series of policy recommendations. All of the analyses reported below exclude the Medical School whose salary structure and incentives are quite different than those of the rest of the University.

How Salary Decisions Are Made

Salary decisions are made by deans and department chairs. The Provost sets an overall target percentage and a range of acceptable raises which may be assigned without his review. For the academic year 1995-96, the overall percentage raise was to be 3.5% and there was another 1.2% available for adjustments at the deans' discretion. The issue of merit is addressed by having a range of permissible raises; for 1995-96, the range was from 2% to 7%. The issue of fairness is addressed by having the Provost review any raises below 2% or above 7%.

At present, there is no formal policy for salary raises or review over an extended period, analogous to the current year-by-year policy. Basic protection of long-term salary interests is based on market demand (faculty who are sought after by competitive programs); no such protection seems to exist for faculty achieving only an internal standard of excellence.

How Well Are We Doing Compared to Other Institutions and Other External Criteria?

We make three comparisons in this section: Penn salaries versus those at comparable institutions based on two sources of data; Penn's overall compensation compared to that of other comparable institutions; Penn salaries versus the cost of living index. Data comparing Penn with other institutions are only available through the 1994-95 academic year.

Penn Mean Salaries and the Mean Salaries at Like Institutions

Using data made available by the AAUP, we compared Penn's salaries to those of eleven other private research universities which in-

clude business schools [Carnegie-Mellon, Columbia, Cornell's endowed colleges, Duke, Harvard, MIT, Northwestern, Rochester, Stanford, Chicago and Yale] The AAUP has developed a weighted index which adjusts the salary structures of each of the other universities to Penn's mix of Assistant, Associate and Full Professors. In 1994-95 Penn ranked fourth on this index (behind Harvard and Stanford, and just behind MIT). This was a small advance in Penn's ranking from ten years before (1984-1985) in this grouping when we were ranked sixth (using the 1994-95 faculty distribution). However, Penn's relative dollar gain on the index over the ten year period was larger than nine of the other eleven institutions. Our salaries were reported to be 77% higher in 1994-95 than they were in 1984-85, while the median gain over that period was 69%. In 1984-85 our salaries were 90% of those at Harvard, the highest ranked school; in 1994-95 our salaries were 94% of Harvard's salaries. This pattern was roughly the same at each academic rank.

Penn's weighted AAUP salary index was also substantially higher (24% higher) than was the salary index at public research universities: the index average across the main campuses of nine major public research universities (Purdue, Berkeley, UCLA, Illinois, Michigan, Minnesota, North Carolina, Texas and Wisconsin) was \$63,550 compared to Penn's index score of \$78,512.

This index for the entire University facilitates comparisons, but there is some risk that the disciplinary mix of faculty across campuses may affect the index's interpretation. (For example, if Penn had a much larger proportion of its faculty in its business school than did other institutions, and business faculty earned higher salaries than did other faculty, institutional salary comparisons would make Penn look better than it should if the issue was relative earnings by faculty within a discipline.) We do not have publicly available data that adjusts the comparison index for the number of faculty by discipline. However, private data supplied by the University does make comparisons within four broad disciplinary classifications [engineering, humanities and social sciences, sciences, management] among an elite group of public and private research universities.

These data show there are roughly comparable rates of gain in salaries over ten years across three of the areas (science, humanities and social science, and engineering) with Wharton doing particularly well. Also, Wharton has made major gains compared to other business schools while faculty in the sciences, humanities and social sciences have done a little better than average, and engineering has just

improved at about the average in that discipline. These results are, overall, less optimistic than those from the AAUP report, although still satisfactory. The AAUP results may be overly influenced by the large number of Wharton faculty here, compared to the number of business faculty elsewhere.

What about total compensation? How well does Penn do comparing salary plus benefits compared to other institutions?

A good proportion of faculty compensation comes in the form of benefits. Using the AAUP index, in 1994-1995, overall compensation at Penn was \$100,162, 27.6% more than the average salary of \$78,512. Penn's ratio of total compensation to salary of 127.6% was the highest among the comparable schools, between 3.4 and 6.8% higher than others of the top five [Harvard 124.2, MIT 124.1, Chicago 123.9, Stanford 120.8].

Using the overall compensation figures rather than salaries alone improved Penn's ranking from fourth to third in the set of twelve institutions, and it also sharply improved its absolute dollar position. While Penn's mean salary was 94% of top ranked Harvard's, Penn's total compensation was nearly 97% of Harvard's.

We admit to some wariness about reporting these numbers since (a) Penn's reported ratio is not consistent with overall benefits rate charged to salaries in 1994-95 (over 30%) and (b) we are quite unsure as to whether all reporting universities include the same items in their overall compensation rate.

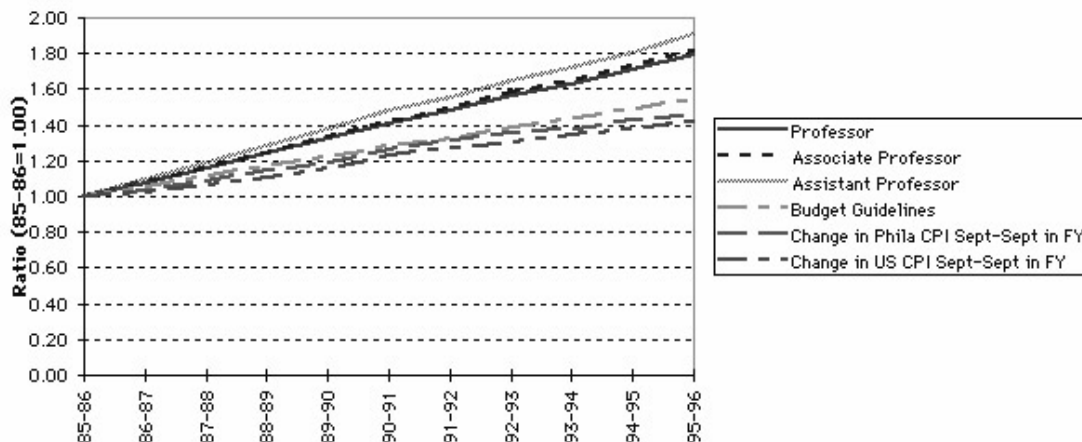
How Well Are We Doing Compared to the Cost Of Living?

Penn's mean salaries over the past ten years have more than kept pace with the cost of living index (CPI) published for Philadelphia by the Bureau of Labor Standards. Figure 1 uses 1985-1986 as a baseline for the mean salary of continuing faculty while using the CPI data as of September 1985 for the cost of living baseline. Over the ten year period the accumulated annual raises for full professors total 79% (annual compound rate of 6.0%), while the CPI has increased only 46% (compound annual rate of 3.9%). Comparisons for continuing assistant and associate professors show a similar pattern, with assistant professors doing somewhat better than associate or full professors.

A comparison of the AAUP salary index in 1994-95 versus the index in 1984-85 (based on the mean salaries paid to all faculty in those years, rather than just continuing faculty) shows the same results. There was a compound rate of

Figure 1

Growth in Salaries 1985-86 to 1995-96



increase of nearly 6.25%, compared to the CPI compound rate of increase of 3.9%.

There are two additional approaches to CPI comparisons, which may be worth some attention. First we may look at the median raise rather than the mean raise, on the grounds that what the faculty member in the middle of the distribution earned is a better measure of the average than is the mean which would be biased upwards by the high salaries of a few faculty. In 1994-1995, for example, the mean raise for full professors was 5.5%; however the median raise was only 4.4%. We do not have medians for previous years so we cannot make a long-term comparison, but we assume that the pattern of higher mean than median raises is consistent over time. If we assume that the median increase was consistently 1% less than the mean raise, then the comparison of the faculty raises to CPI index would be less favorable (a compound rate of 5.0% for continuing full professors), although still substantially better than the CPI of 3.9%.

A final approach is to shift focus from annual aggregate raises across the faculty, to the performance of individual faculty over a multi-year period. Here we examine the median raise of full professors who remained at Penn for the five-year period between 1990-91 and the current academic year. The median annual compound raise is a little more than 4.3%, compared to an annual CPI rate of increase of 3.0% over the five-year period ending in September, 1995.

What Is the Nature of The Distribution of Salary Raises Among the Faculty?

It is important that the average faculty member progresses well, compared to faculty elsewhere and compared to the Philadelphia area CPI. However very few faculty earn the average salary within their discipline. We are also concerned with the distribution of salaries among

faculty. We examine the distribution of salaries against two criteria—the equality of the distribution, and the proportion of the faculty whose raises match the increase in CPI.

Unequal salaries have many causes (rank, longevity, market demands across fields and subfields, productivity), some of which will be seen as legitimate. Thus the fact of inequality does not define the presence of inequity. Nonetheless, the discussion of whether inequity is present needs to begin with the facts of inequality. Our first measure of inequality compares the ratio of total salaries which are earned by the top one-fifth of the faculty and the bottom one fifth of the faculty. To decrease the effects of disciplinary differences all comparisons are made within a school, or for SAS, broad groupings of natural science, social science and humanities. We have been given these data with the understanding that we may not disclose specific within area numbers. We begin this analysis considering only full professors, since the numbers of assistant and associate professors within schools and disciplinary groupings are often too few to estimate these statistics with any stability.

Across 10 schools/areas where there are at least 9 full professors, the bottom one-fifth of the faculty earn between 14% and 17% of total salaries, while the top fifth earns between 25% and 29% of total salaries. The weighted average ratio of the top to bottom 20% is 1.74, that is: the top one-fifth of full professors within an area earn 74% more than the bottom one-fifth of full professors. In eight out of ten groupings, including all of the larger areas, the ratio is between 1.64 and 1.89. At this time we do not have data for these ratios over time, and thus cannot say whether the level of inequality in the 1995-96 salary distribution is greater or less than it has been in previous years.

Another way of looking at the same issue is to consider the distribution of raises over a multi-year period. In this analysis the raises

given by each of the schools/areas to continuing full professors over the 1990-91 to 1995-96 period are compared. The median increases vary among schools (from 18-30% over the five year period), which may reflect differences in the wealth of schools. Also the range of raises granted faculty vary a great deal between schools. For example, the interdecile range (the difference between the 10th and 90th percentile in raise granted over the five year period) is as little as 14%, and as high as 31%. The interquartile range (the difference between the raises granted to the faculty members at the 75th and 25th percentile) varies from 6% to 13%. There is no particular association between the median raise and the range of raises granted (the correlation between median raise and interdecile range is .12). Thus, one interpretation of these differences in ranges suggests sharp differences between schools in their criteria for allocating salaries, rather than any differences in available funds. Some allow much larger variation in raises granted than do others.

A second criterion for examining the salary distributions incorporates the idea of a safety net. We assume that only under rare conditions would the University choose to reduce the real salary of a faculty member, by giving a raise smaller than the increase in the cost of living. This criterion should be met in any given year, but would be particularly relevant over a longer period. We compare the CPI with the raises given to continuing assistant, associate and full professors in 1995-96, and with raises given to full professors over the five-year period between the 1990-91 and 1995-96 academic years. We only present data for which there were at least 15 people in the rank in the school/area.

All of the schools/areas have made sure that at least 75% of their faculties at each rank have received CPI-level raises in 1995-1996. However, not all of the schools/areas have made sure that at least 90% of their faculty have received

CPI equivalent raises. In 1995-96, when the CPI for the previous year was 2.6%, 3 out of 6 schools reported that at least 10% of their continuing full professors received less than the CPI increase. Two of 5 reporting schools said that 10% of their associate professors, and 0 of 4 reporting schools said that 10% of their assistant professors received raises below the CPI.

All of the schools/areas have assured the top 75% of their continuing full professors of raises of at least 16% over the 1990-1995 period, the increase in the CPI for the period. However six of 10 reporting schools/areas (including all those with at least 6 full professors continuing for the entire period) have allowed the bottom 10% of their faculty to fall below that criterion.

Some Conclusions

We have done our best to make sense of the data that were made available to us or that we were able to gather independently. However we recognize that mistakes may still have been made in the process of analysis. Nonetheless, we believe that the following are likely to be true:

1. Penn's mean salaries are competitive with those of other like institutions, with some substantial relative gains in the past ten years. This is particularly true if overall compensation is considered. Average salaries have also increased well above the rate of increase in the CPI. Penn's strong performance reflects particularly large gains in some schools, but at least competitive gains in all schools and areas.

2. There is substantial inequality of salary and percentage salary raises within each school and area, and the degree of inequality varies a fair amount among them. The inequalities within schools/areas are seen whether one does an analysis of the distribution of total salaries in a single year or over time analysis of percentage raises given to continuing full professors.

3. There is a percentage of the faculty who fall below the rate of CPI increase, and thus who can be said to be taking a cut in pay in real terms. Out of 15 comparison groups defined by rank and school or area, five included 10% of their faculty with under CPI raises in 1995-1996. (About 15% of all faculty of the University received raises less than 3%.) There are conditions of lack of productivity, (or of University-wide budget problems in some earlier years) which might justify raises less than the CPI. Some schools or areas may believe that more than 10% of their faculty are performing so poorly as to be deserving of cuts in salary, and can justify these results. However this common pattern of more than 10% of the faculty in an area/school receiving a real cut in pay in a year when the total salary pool available permitted raises of 4.7% (the sum of the regular funds of 3.5% + 1.2% in special opportunity funds) well above the CPI of 2.6% has to raise concerns.

4. The central administration has clear policies about the ranges of acceptable percentage pay raises, and about the average pay raises to be granted across the University. In the past these have been somewhat ignored by individual

schools which have given average raises often more and sometimes less than the recommended amount. The Provost has indicated that he intends to enforce the University wide limits in the future more strictly than they have been enforced in the past.

5. The central administration has no explicit policies about long-term raises, neither to assure that there is some floor below which individual raises will not fall, nor to consider what levels of inequality of raises will be acceptable.

6. The central administration restricts publication of information about salaries for reasons of individual privacy and to control the level of individual complaints about salary. At the same time the central administration provides no information to the schools which would allow them to take into account long-term individual salary histories, inequalities and inequities.

Policy Recommendations

1. The Provost, in consultation with the faculty, should establish a formal policy for salary raises over a multi-year period, analogous to the current one-year policy. At the very least it should establish a floor for raises over a five-year period with exceptions granted only with explicit permission of the Provost. It might also define a median raise and an expected range of acceptable raises over the five-year period. (The establishment of such a policy would also require that the central administration provide detailed long term information about salaries to deans and department chairs, so that salary decisions might be made in light of such information.)

2. There should be no publication of individual salaries. However distributional information about salaries within broad disciplinary areas should be made available to all faculty. This might include the median and the interquartile range (25th percentile and 75th percentile) of both salaries and percentage increase in salaries. This information might be aggregated by rank and by school/area, with no data reported for groupings that included less than 20 faculty which might reveal individual information. We recognize that this may increase tension between administrators and faculty; but the current circumstance is structurally out of balance, in which individual faculty have little information, except for University-wide averages, on which to base any claim of inequity. They are entirely subject to the decisions of administrators with minimal information to use as the basis for negotiation.

3. Annually the Provost establishes a floor for raises acceptable without explicit review by the Provost. In years when the available funds permit average raises 1% larger than the CPI, that floor should be the CPI for Philadelphia for the previous 12-month period at the time raises are calculated. This will ensure that no faculty member receives a cut in real pay without agreement by the Provost that such a cut in pay is justified.

4. In any year in which the entire salary pool is not 1% higher than the CPI increase, then

individual schools should implement salary policies which do not exacerbate existing inequalities of salary among faculty who performed at a satisfactory level. One such policy would provide nearly uniform percentage raises, so that raises for some do not impose the burden of a cut in real pay on others. Another such policy would provide higher percentage raises for less well paid faculty, for example providing uniform dollar raises among all faculty, thus decreasing inequality. This policy would continue to allow lower raises to those who did not perform at a satisfactory level.

5. Through several measures we have now begun to establish the degree of inequality within schools/areas. The inequality is substantial. We are unable to determine whether or not this inequality may reflect some inequity, or is a legitimate product of market and other forces which lead to such differentiation. It is our intention to investigate this issue in the coming year. We will focus particularly on the tension between salary policy based on merit and salary distributions over time that are fair. Our view is that salary differentials among individuals should reflect real and important differences in productivity and genuine differences in the market. There should not be a situation in which the cumulative effects of year-to-year decisions, over the long run, result in unacceptably large salary differentials among individuals who differ only marginally in productivity (based on the quality of individual scholarship, teaching and citizenship). A great University will always have a few scholars of exceptional renown, but its greatness depends on the overall excellence and well-being of its entire faculty.

We will consider whether, in order to avoid such problems of poor distribution, either within departments or schools, we believe that long-term salary policies need to be enacted, and a pool of money needs to be supplied (perhaps at the Provost level) to correct for long-term disparities at the individual, department or school level.

The current report will be submitted to the Provost; we will report on the administration's response to it in the Spring.

Senate Committee on Economic Status of the Faculty

Robert C. Hornik (communication), *Chair*
Roger M. Allen (Asian & Middle Eastern St)
Elizabeth E. Bailey (public policy & mgmt)
Charles E. Dwyer (education)
Laura L. Hayman (nursing)
Jerry S. Rosenbloom (insurance)

ex officio:

Faculty Senate Chair
William L. Kissick (med)
Faculty Senate Past Chair
David K. Hildebrand (statistics)
Faculty Senate Chair-elect
Peter J. Kuriloff (education)

Sharpening Your Research Profile on the *PennExpertise* Database

Penn faculty members can now add and update their records in *PennExpertise*, the University's network-accessible database of faculty and their research specialties.

The database supports full-text searching and was designed to enable faculty members to identify potential research collaborators, students to locate potential advisors, and staff to respond to inquiries from potential donors, the media, and others. Maintained under the auspices of the Vice Provost for Research by Baltimore-based Community of Science (COS), *PennExpertise* is now accessible via the Internet to all American universities and to a set of commercial research organizations that pay fees to COS.

Faculty members already in the database will soon receive via campus mail an individual username and password with which they can be authorized to update their records. Other faculty members can access the database directly, assigning themselves a username and password for use in subsequent updates. All access is via "forms-capable" World Wide Web clients, such as Netscape, Mosaic, and Lynx.

Background

In 1993, the *PennExpertise* database was developed and edited into a consistent format by COS from faculty members' varying *curricula vitae*. Delivery to the Penn community was via a "Gopher" database using a "WAIS" index for full-text searching. About half of the standing faculty contributed data to the database at that time.

In the past year, COS, like most other Internet-based publishers, converted its user interface to the World Wide Web and added on-line forms to enable faculty members (or their proxies) to add and update records. A committee charged by former Vice Provost for Research Barry Cooperman assessed the COS approach and has recommended that the University continue participating in the COS program, which now includes over 40,000 researchers from nearly 100 universities. The new, WWW-based interface is now available on the "Faculty View" in the redesigned Penn Web.

Several aspects of the COS program were noted by the committee:

- Although the vendor's name implies a focus on science, in fact all faculty are welcome—and strongly encouraged—to become part of the database

- The database, its WWW interface, and the editing required to maintain its coherence could be done internally, but at a higher cost to the University than by contracting with COS.

- COS does, however, restrict access to the database to American universities and to commercial organizations that subscribe to its database search services. Faculty members who wish to make their information available throughout the Internet without restriction can do so through personal home pages. (The COS record allows for a link to a personal home page as well.)

- COS also provides additional services, including searchable databases of grants available, grants received, and research facilities.

The screenshot shows a Netscape browser window titled "Netscape: University of Pennsylvania Expertise". The address bar contains the URL "http://medoc.gdb.org/work/fields/upenn.html". The browser's toolbar includes buttons for Back, Forward, Home, Reload, Images, Open, Print, and Find. Below the toolbar, there are links for "What's New?", "What's Cool?", "Handbook", "Net Search", "Net Directory", and "Newsgrc". The main content area displays the "Penn" logo in a large, stylized font. Below the logo, the text "University of Pennsylvania Expertise" is centered. A message states: "It is strongly recommended that you read the [instructions for searching this database.](#)". Two buttons, "Clear the fields" and "Do The Search", are positioned below the message. A search form follows, with a section labeled "All Fields:" and a list of checkboxes corresponding to different search criteria: Name, School/Division of, Education, Past Positions, Expertise, Keywords, Patents, and Recent Publications. Each checkbox is followed by an input field for text entry.

- The COS program to market the database to commercial organizations seeking research collaborators and technology transfer could result in revenue to the University, although no such revenue could be accounted for in the first two years of the program.

Checking your Record

To determine if you are in the database or if your information requires updating, use a desktop Web browser (such as Netscape or Mosaic) or telnet to www.upenn.edu to access the Penn Home Page (<http://www.upenn.edu>). Then:

- Select "Faculty & Colleagues Worldwide"
- Scroll down and select "Penn Expertise"
- Enter your last name in the "name" field and "do the search"
- Follow the instructions below for "updating" or "adding yourself."

Updating your Record

- Return from the search screen and select "Update Your University of Pennsylvania Expertise Record."

- After reading some brief instructions, you will be prompted for your username and password. (You are the only researcher with this username and password.) Your current record will then appear in the on-line form for your "update."

- Enter your new information (you may "cut and paste" from other sources)

- Keep your username and password handy for future reference.

Adding yourself to the Database

- Return from the search screen and select, "Add Yourself to the University of Pennsylvania Expertise Database."

- Complete the form, making note of the username and password you have chosen for your use in future updates.

Where your Information Goes

Your record will not go into the database until it has been verified by a team of COS technical editors. For approximately two weeks, you will be unable to see your new entry or update your profile.

Many thanks for your participation in the University of Pennsylvania faculty Expertise database. If you or an assistant lack WWW access, please see your local computer support personnel or contact this office.

— Stuart Watson

Assistant Director, Research Administration

PennExpertise Committee Members

Joseph N. Cappella

Professor of Communication

Janine Corbett

Assistant Vice Provost for Research

Neal Nathanson

Professor and Chair Emeritus of Microbiology

Daniel A. Updegrave (chair)

Associate Vice Provost, ISC

Stuart Watson

Assistant Director, Research Administration

The following faculty members' research projects were funded from the University's internal Research Foundation in the fall round. Proposals are due March 15 for the spring round 1996; please see Almanac January 30 for guidelines on applying.

Research Foundation: Awards in the Fall Cycle 1995

Sherrill Adams and Hyun-Duck Nah, Biochemistry, Dental Medicine; *Control of $\alpha 2(I)$ Collagen Production in Cartilage.*

Kurt Barnhart, et al., Obstetrics & Gynecology, Medicine; *A Pilot Investigation of the Effect of the Replacement of Dehydroepiandrosterone (DHEA) in Symptomatic Perimenopausal Women.*

Haim Bau and Howard Hu, Mechanical Engineering, SEAS and Don Voet, Chemistry, SAS; *Macromolecular Crystal Growth.*

Regina Bendix, Folklore and Folklife, SAS; *Strategies of Cultural Commodification in Carinthia, Austria.*

Eugene Buckley, Linguistics, SAS; *Alsea Texts Project.*

Simon Carding, Microbiology, Medicine; *Regulation of Hematopoiesis and Stromal Cell Function by Interleukin-2.*

Robert DeRubeis, Psychology, SAS; *Cognitive Therapy and Pharmacotherapy for Depression.*

Daniel Deudney, Political Science, SAS; *The Problem of Identity and Community in Republican Political Orders.*

Arthur Dunham, Biology, SAS; *Feeding Rates and Net Assimilated Energy of Iguanid Lizards Measured by Turnover of Stable Carbon Isotopes.*

Joseph Ecker, Biology, SAS; *An Arabidopsis Thaliana Genome Sequencing Center at the University of Pennsylvania.*

Sydney Evans, Clinical Studies, Veterinary Medicine; *Does Hypoxic Radioresistance Develop in Human Breast Xenografts Following Tamoxifen Administration?*

John Fantuo, Graduate Education; *Quality Measures for Quality Practices: Towards a More Inclusive Knowledge Base of Family Functioning in Head Start.*

Loretta Flanagan-Cato, Psychology, SAS; *Molecular Cloning of Brain Oxytocin Receptors.*

Jonathan Fox, Medicine, Medicine; *Autocrine FGF Signaling, Cell Cycle Regulation, and Apoptosis in Vascular Smooth Muscle.*

Fred Frankel, Microbiology, Medicine; *Developing a Safe, Live Vaccine for HIV.*

Anthony Garito, Physics, SAS; *Fabrication Facility for Gigabit Plastic Optical Fiber.*

Tom Genetta, Medicine, Medicine; *Developmental Expression and Functional Characterization of the Transcriptional Repressor MEB1.*

Robert Giegengack, Geology, SAS; *Quaternary Stratigraphy of Lake Balat, Dakhleh Oasis, Egypt.*

Robert Giegengack, Geology, SAS; *Assessment of the Genetic Diversity of an Isolated Population of the African Cheetah (Acinonyx Jubatus) in the Quattara Depression, Egypt, and Study of the Circumstances of Isolation of that Population.*

Michael Glick, Oral Medicine, Dental Medicine and Francisco Gonzalez-Scarano, Neurology, Medicine; *Biopsy of Lingual Lymph Nodes for Analysis of Viral Load.*

Kristin Gowin, Medicine, Medicine; *Fibromyalgia: Its Prevalence in the Geriatric Population and Association with Co-Morbid Illnesses.*

Renata Holod, History of Art, SAS; *Archaeo-*

logical Survey of the Island of Jerba, Tunisia.

Olena Jacenko, Animal Biology, Veterinary Medicine; *Molecular Mechanisms of Endochondral Skeletogenesis.*

Jerry Jacobs, Sociology, SAS; *Gender and the College Curriculum: Trends During the 1970s and 1980s.*

Abbas Jawad, et al., Pediatrics, Medicine; *Cholesterol Education for At-Risk Children: Secondary Analyses.*

Thomas Jongens, Genetics, Medicine; *The Establishment of the Germ Cell Lineage in Drosophila.*

Malek Kamoun, Pathology & Lab Medicine, Medicine; *Identification of Novel Intracellular Proteins Linking Signal Transduction to RNA Processing.*

Patrick Kehoe, Economics, SAS; *The Poverty of Nations: A Quantitative Exploration.*

Daniel Kessler, Cell & Developmental Biology, Medicine; *Gastrointestinal Development: Induction and Patterning of Endodermal Lineages in Xenopus laevis.*

Dusan Kocovic, Medicine, Medicine; *Radiofrequency Ablation Maze Procedure for the Treatment of Atrial Fibrillation at the Time of Open Heart Surgery in the Dog Model.*

Leszek Kubin, Animal Biology, Veterinary Medicine; *Serotonin Receptor Expression in Brainstem Motoneurons.*

Cecilia Lo, Biology, SAS; *Transgenic Analysis of Gap Junction Gene Function and Regulations.*

Elwyn Loh, Medicine, Medicine; *DNA-Based Vaccine Against Cervical Cancer.*

Patrick Loll, Pharmacology, Medicine; *Crystallization of the E5 Oncoprotein.*

Edward Lusk, Statistics, The Wharton School; *The Use of Color as a Literary Mechanism in "La Modification."*

Anuradha Mathur, Landscape Architecture, GSFA; *The Mississippi Floods—Mapping a Shifting Terrain.*

Antonio McDaniel, Sociology, SAS; *Inter-racial Marriage and Births.*

Patrick McGovern and Stuart Fleming, Museum Applied Science Center for Archaeology, MASCA; *Organic Content Analysis of Ancient Vessels: Spectrometer Upgrade.*

Stuart Meyers, Clinical Studies, Veterinary Medicine; *Sperm-Associated Hyaluronidase Function in the Stallion.*

Roy Middleton, Physics, SAS; *Interim Support for Personnel Required for Sample Preparation for the University of Pennsylvania's Accelerator Mass Spectrometry (AMS) Facility.*

Cynthia Otto, Clinical Studies, Veterinary Medicine; *The Effects of Tolerance on Differential Gene Expression in Macrophages.*

Debkumar Pain, Physiology, Medicine; *Electrophysiology of the Mitochondrial Protein Import Machinery.*

David Perkel, Neuroscience, Medicine; *Effects of Altered Vocal Production on Song Learning in Songbirds.*

Hermann Pfefferkorn, Geology, SAS; *Global Paleoclimate Changes at Greenhouse-Ice Age-Greenhouse Transitions: Late Paleozoic Fossil Floras from the Canadian Arctic.*

Stephen Phipps, Geology, SAS; *Optical and Electron-Beam Analysis of Micro-Thin Sections*

of Rocks from Plate Convergence Zones.

James Primosch, Music, SAS; *A Recording of Four Musical Compositions.*

Srinivas Rajagopal, Systems Engineering, SEAS; *Congestion Control in High Speed Networks Via Fluid Models.*

Andrew Rappe, Chemistry, SAS; *Theoretical Mechanistic Modeling of Inorganic Pyrophosphatase.*

Michael Reisch, Social Work; *Assessing the Development of the Non-Governmental Social Services in Bulgaria: A Case Study of the Implications of the Shift to a Market Economy on Societal Responses to Human Needs.*

Robert Riddle, Cell & Developmental Biology, Medicine; *Molecular Basis of Dorsoventral Pattern in the Vertebrate Limb.*

Bruce Rosengard, Surgery, Medicine; *Two-Way Cell Trafficking and Microchimerism: Mechanisms of Rejection and Tolerance in Response to Solid Organ and Cellular Transplants.*

Thomas Safley, History, SAS; *Children at the Edge: Expectation and Experience Among the Orphans of Early Modern Augsburg.*

Randall Sakai, Animal Biology, Veterinary Medicine; *Social Stress: Neuroendocrine and Neurochemical Correlates.*

Gerhard Schad, Pathobiology, Veterinary Medicine; *The Role of Chemosensory Neurons in Host-Finding and Development of Parasitic Nematodes: Laser Microbeam Ablation Studies.*

Richard Schultz, Biology, SAS; *Request for Funds to Purchase Beckman LS6500 Value Scintillation System.*

Neil Shubin, Biology, SAS; *Isotopic Approaches to the Early Evolution of Modern Vertebrates.*

David Silverman, Asian & Middle Eastern Studies, SAS; *1996 Season: University of Pennsylvania Museum Expedition to Saqqara.*

Gary Smith, Clinical Studies, Veterinary Medicine; *A Sustainable, Community Approach to the Control of Hydatid Disease in Northwest Turkana, Kenya.*

J. Smith, Computer & Information Science, SEAS, and P. Keener and H. Williams, Physics, SAS; *Characterizing the Fibre Channel Interconnect Technology for Event Building: A Collaboration Between the Depts. of Computer and Information Science and Physics.*

W. John Smith, Biology, SAS; *Monitoring Avian Demography in Endangered Malaysian Ecosystems.*

Hansell Stedman, Surgery, Medicine; *Can Muscular Dystrophy be Reversed with Existing Genetic Technologies?*

Kathleen Sullivan, Pediatrics, Medicine; *Early Complement Component Expression in SLE.*

Yoshitaka Suyama, Biology, SAS; *Mitochondrial Receptors for the Protein and tRNA Import Machinery in Leishmania tarentolae.*

Hung Tseng, Dermatology, Medicine; *Is Basonuclin a Regulator of Cellular Proliferative Potential.*

Elizabeth Wilder, Cell & Developmental Biology, Medicine; *Motional Imaging in Turbid Media with Diffusing Near Infrared Light Fields.*

Konrad Zinsmaier, Neuroscience, Medicine; *Analysis of Depolarization-Dependent Neurotransmitter Release in Drosophila Mutants.*

Engineering's ENIAC Enthusiast

By Martha Jablow

Any party requires planning, but a 50th anniversary celebration for the world's first all-electronic computer has presented a complex challenge over the past few years. Now the guests are at the front door.

The high point of the celebration of ENIAC (the Electronic Numerical Integrator and Computer) will be Wednesday, Feb. 14, when Vice President Al Gore, honorary chairman of the ENIAC celebration, will come to Penn to deliver a major policy speech. With President Judith Rodin's assistance, he will throw a switch and light up a portion of the original ENIAC. That evening, President Rodin will host a dinner as the University joins major Philadelphia institutions, corporations, government officials and computing societies to toast the invention that has transformed the way information flows around the globe and into space.

Although everything comes together next week, this is really just the beginning. ENIAC events (*see box, page 11*) will continue for another 18 months of symposia, exhibitions, visits from schoolchildren and a host of other events celebrating "The Birth of the Information Age." That phrase, which appears on the ENIAC logo, was coined by SEAS Dean Gregory Farrington, the man at the center of the celebration—though he credits many other players.

"There is a method to the madness, and there's definitely been madness," he reflected during an interview in his sunny corner office of the Towne Building last week. Among the many hectic and humorous moments leading up to next week's celebration—and some "of pure, abject terror"—Dean Farrington shuddered at these:

His Thanksgiving pie-baking was interrupted by an ENIAC-related call.

As he was explaining the significance of ENIAC and modern computer technology to a former Penn student, the student began to doze off. The student was the Mayor of Philadelphia, Edward G. Rendell (C'65).

And there were times when "some people thought a few of my ideas were flaky," Dean Farrington recalled, chuckling.

But through all the planning—which spanned the administrations of three Penn presidents—the dean has kept two objectives clearly in focus.

"I've always had two goals: One is to communicate to the world what a truly dramatic advance was made here [with the birth of ENIAC]. The other is to highlight the genius of Penn—to attract attention to Penn as a dynamic, interesting place—and to position Philadelphia as a place of technology After all, the birth of the information age took place at this University and in Philadelphia.

"This 50th anniversary comes at such a time of opportunity that is the result of ENIAC," he added. "So much of what we're doing in the world today—in education, communications, politics, economics—is driven by the fact that we can communicate faster, cheaper, and at length. That's the product of ENIAC."

To underscore the impact of ENIAC, Dean Farrington often uses two examples, the printing press and the automobile. "There's nothing so comparable in history, so dramatic, since the invention of print," he said. "In 1200, the Bible was written by hand, but mass-produced. That was followed by the production of print. By the early 1800s, there was cheap print with the rotary press. The resulting spread of literacy affected politics, economics, education."

But the automobile brought about a speedier revolution. "In 1880, everyone traveled by horse. But by 1920, most people didn't. The horse had been used for thousands of years, but it was replaced by an emerging technology known as the car—within just 40 years," he noted.

The information revolution spawned by ENIAC took less than a lifetime, but as the dean pointed out, the past five to 10 years have brought the most startling technological changes not only in the way and speed information moves around, but also in its impact on higher education in particular.

The spotlight on ENIAC offers another

way to reconsider the role that universities can and should play in the future, in Dean Farrington's view. It is a challenge that clearly excites him. As he explained, his speech sped up, matching his metaphor for "putting Penn in the passing lane."

"If academe chooses not to go along, we'll be swept away by others in the passing lane," he said. "If we continue to think that higher education is just in the business of giving information, we'll never get in the passing lane."

ENIAC anniversary events can be "a turn on for Penn," he added. "For the University, I saw this [anniversary] as a challenge We are suddenly in an onrushing age. We have things available that weren't even thought of five years ago. The technology of the book suddenly has changed.

"Universities were built around books," he contin-

ued. "Universities have been in the business of collecting and sorting information, in the form of books. Students had to come to them. Faculty had to live near universities. Suddenly the library is everywhere. The library is wherever you are today. It follows you. You can't escape it."

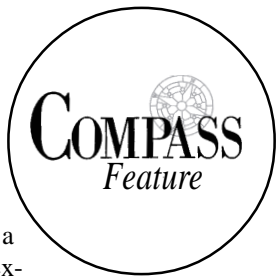
The availability of accessing information electronically, from nearly any place, at any time, and with lightning speed, challenges the way that higher education traditionally organized itself. "The idea of lecturing has been treated like a commandment written on Moses' tablets," Dean Farrington said. That has to change, in his view, or universities will lose out.

The modern computer makes learning lifelong and available to new users in new places. Dean Farrington predicted that within five to 10 years, "I'll be able to talk visually, with my face on the screen, to anyone around the world. The data will flow anywhere. People will work from home, office, dorm, laboratory. We can collaborate, talk, serve students throughout



Photograph by Tommy Leonard

Dean Gregory Farrington



their lives.”

The self-described “very touchy-feely engineering dean” likes that face-to-face interaction. But it’s more than feel-good learning. “The best universities will have much bigger markets,” he noted, if they use new technological tools to serve people in new ways. He cited the example of Penn’s nursing school, which employs the technology of “distance-learning” in a nurse-midwifery master’s level program for students in other parts of Pennsylvania.

While the tools of education have changed, and new ways of learning have been created, the dean warned that, “We have to be careful or we’ll have what I call ‘the microwave problem.’ Remember when microwave ovens first came out? They were supposed to do everything—bake bread, cook anything. But they can’t do everything.

“Some people think that a new thing is supposed to do everything. That’s rubbish. It will do some things well, but not everything. Our job is to be very creative, to focus on how the student learns best.” He cited the example of learning another language.

“The new technology can provide what I call the ‘snickerless, indefatigable tutor.’ Why do so many students not want to speak out in a language class? They don’t want to be laughed at [for mispronunciation.] But a CD-ROM or computer ‘tutor’ doesn’t snicker.

“It won’t teach you Dante. You still have a lot of hard work to study Dante, but it teaches you the language. In other words, it heats your soup, but it won’t bake bread.”

Returning to his goals for the ENIAC

celebration, Dean Farrington said that he wanted the events “to position Penn as an institution that would take on the mission of defining new ways of teaching with the new tools. If we do it right, we can get into the passing lane. Suddenly, we have the new tools, the new fuel. All the rules have changed, and we can take advantage of that. We have the content. Most important—we have the highest-quality content.

“The market will define what universities will be-

come,” he predicted. “We suddenly have new competition from private industry.” For fundamental research needs, industry and government traditionally came to universities—as in the 1940s, the Army came to Penn’s Moore School of Electrical Engineering for a faster way to calculate ballistics tables and accelerate the aim of artillery equipment.

But that is changing, he noted, referring to a recent comment of a General Electric vice president. Asked “Where are you

going to get your research?,” his answer was “Wherever I can.” Dean Farrington said, “That should be chilling” for higher education. He predicted the “outsourcing of higher education—wherever the brains

are. It’s a global view. They’ll buy research wherever they can. It’s already happening in software, in China, in India.”

This is just one implication for higher education ushered in by new technology. Dean Farrington hopes that this and other issues will be tackled by an

ENIAC-related symposium in October for “high-level leadership from many universities to address strategic issues and choices that universities will face.”

The ENIAC events also are providing an opportunity to create more connections between the University, the City of Philadelphia, and local civic, industrial, cultural and economic leaders. These connections, the dean said, “should be a spark to push Philadelphia ahead as a leading center of technology and learning.”

For more about ENIAC...

The “ENIAC Celebration: The Birth of the Information Age” will bring together computing pioneers, scholars, business leaders, scientists and technology advocates for a series of events focused on the birth of modern computing and the ongoing technological revolution in all aspects of our work and lives that began with ENIAC. The 50th anniversary celebration will span 18 months and will be marked by symposia, hands-on demonstrations of new electronic technologies, art exhibits, and other events on campus and throughout Philadelphia. For more information, log onto the ENIAC home page at <http://homepage.seas.upenn.edu/~museum/> for a schedule of events. For information about tickets and reservations for the 50th Celebration Dinner, hosted by President Judith Rodin, call 575-2200 or the ENIAC hotline: 898-8724.

Although inventors John W. Mauchly and J. Presper Eckert had a few things going in their favor back in the 1940s, building ENIAC was a big gamble. For centuries, mathematicians tried to get something or someone to do their math for them. As a result, great progress was made towards the next computing machine. For example, electricity was already in use to power computers that moved cylinders and wheels to produce answers. These computers were very fast but many times gave the wrong answer.

There were also computers based on digital arithmetic that would give the right answer but too late, even when powered by electricity. It was impossible to have quick and correct answers at the same time. A very promising computer, using electronic voltages instead of moving cylinders to produce answers, was built at MIT. It was electronically fast but arithmetically inaccurate.

Mauchly had seen the first electronic digital computer (one that did not measure voltages to get the answer) in a visit to Iowa in 1941. This computer was fast and precise, but was small and could

only answer one type of question. He thought he could push the limits of an electronic digital computer much further. He dreamed of a machine that could address any math problem. But he realized that he would have to build something much bigger.

The computing gurus of those days—many of them at MIT—thought it was futile to put together 18,000 rowdy vacuum tubes and expect them to work as a unit for long enough time to solve a complex mathematical problem. So they kept working on their voltage-based computer. But systems like theirs, based on precise measurements of voltages, were too prone to mathematical errors.

Eckert, who was an electrical-engineering wizard, thought he could make the 18,000 rowdy vacuum tubes work as a single orchestra. ENIAC showed it was possible for an electronic giant to give the right answer quickly and over long periods of time. The Penn inventors won the gamble, and a new electronic information age was born.

—Esaúl Sánchez

A Silicon Chip Off the Ol' Block

By Jerry Janda

In 1946, a machine capable of performing complex mathematical equations could only be accommodated in a room the size of a gymnasium. Today, a chip with comparable computing power can fit on your fingertip.

The Electrical Numerical Integrator and Computer (ENIAC) may have launched the information age, but it didn't offer the convenience of laptop computing. Built at Penn during World War II, the machine took up 1,800 square feet and weighed a whopping 30 tons. Not exactly portable.

Until now.

Electrical-engineering students Lin Ping Ang, James Tau and Titi Alailima are designing a less-cumbersome version of the ENIAC. Together, they are creating a silicon chip that calculates like the world's first computer.

When the students began work last spring, they expected to complete the chip in time for this month's ENIAC festivities. "We thought, 'ENIAC is the world's very first computer,'" Mr. Tau remembered. "'How hard could that be?'"

As it turned out, very. ENIAC was much more intricate than the students had ever imagined.

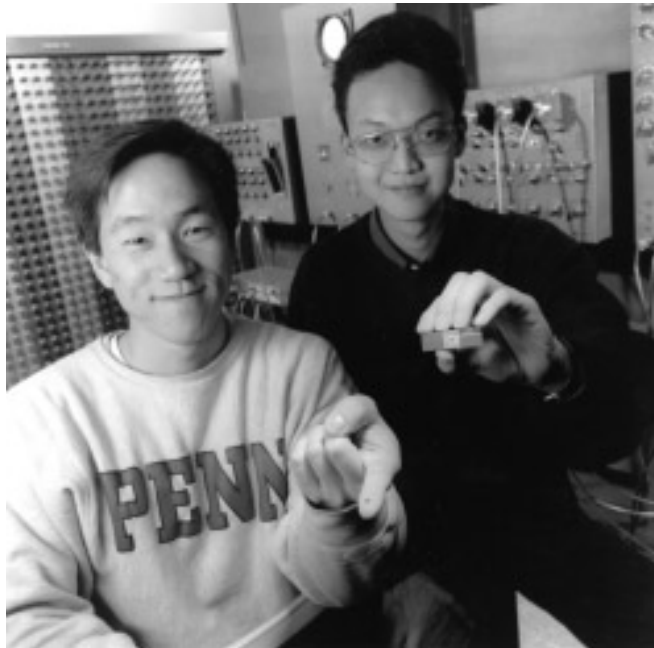
"I had originally thought that the ENIAC must be so simple that I could handle the task all by myself," Mr. Alailima admitted. "Ten months later, with a core team of three and several people doing supporting roles, the project has still been daunting."

"Even though the circuits themselves weren't very challenging, per se, putting its architecture on a silicon chip requires some of the most state-of-the-art, cutting-edge research on network connections," Mr. Tau added. "So it turned out to be a boon for us in the sense that we got to learn some of these issues and the things required to solve them."

The chip project was the brainchild of Jan Van der Spiegel, the undergraduate chair of electrical engineering, and Fred Ketterer, associate professor of electrical engineering. At the time of the idea's inception, Mr. Ang (SEAS'97) was doing

research with Dr. Van der Spiegel. "When ... ENIAC on a chip came up, he approached me and said, 'Would you like to get involved in this?'" Mr. Ang recalled. "And I said, 'Sure, why not?'"

Dr. Van der Spiegel also asked Mr. Tau, a second-year graduate student, to chip in. "I took a class in VLSI [very large scale integration] design—a circuit-design class—and Dr. Van der Spiegel was look-



Photograph by Stuart Watson

Electrical-engineering students James Tau (left) and Lin Ping Ang hold test chips. The original ENIAC took up 1,800 square feet and weighed 30 tons.

ing for somebody to do the design work," he said.

"I had an interest in doing my thesis on VLSI design work," Mr. Tau continued. "Dr. Van der Spiegel gave me a topic my first year, but I hadn't done anything with it. Then when he had the chip idea, he asked me if I had done anything with the original topic, which I hadn't. He said, 'Great, here's another opportunity if you are more interested.' And sure enough, I was."

Mr. Alailima, another second-year graduate student, was interested in designing a chip version of the ENIAC before the project was even announced. "I actually had come up with the idea independently and talked to Dr. Ketterer about it, at which point he informed me that such a project was also being planned by various higher-ups," he recalled. "It was an exciting coin-

cidence."

Before designing their chip, the students literally went back to the drawing board. They looked through archives and found the ENIAC's blueprints and manuscripts. They read through the material to gain an understanding of how the ENIAC worked, then they began to convert the machine's vacuum-tube circuits to analogous modern transistor circuits.

"At certain level of abstraction, there are similarities among the two types of circuits, although at the lowest level, similarities disappear," Mr. Tau said. "This is useful because once we identify the correspondence between a block in the ENIAC and modern digital component, we simply substitute the modern component for the ancient block."

"We just think about the functionality of it," Mr. Ang added. "Then, we try to keep as close as possible to the original architecture and transfer it to modern-day technology."

When the older components don't have a modern match, the students design their own circuits using CAD (computer-aided design) tools. The CAD tools are also used to test the circuits be-

fore the chip is manufactured.

"This step contains two parts," Mr. Tau said. "The first is essentially writing programs that describe the structure of the circuits, and running them like one would run a program on the PC. When we have verified that everything works, we then simulate the circuits at the transistor level, which takes into account the effects of such parameters as temperature, size of the transistor, capacitances and resistances If this stage shows outputs that match the previous simulation, then we begin placing the transistors, using our computers, as they would be located on a silicon chip—a process called layout."

The students must place 300,000 transistors on the chip. And that's the easy part. The hard part is finding a way for the chip to mimic the ENIAC's 20 accumulators—the brains of the machine. "Primitive and



rudimentary as the accumulator is compared to the modern microprocessor, it is, however, similar in function," Mr. Tau said.

Since the accumulator and microprocessor share similarities, the answer to the design dilemma may seem obvious: Build a chip with 20 microprocessors, one for each accumulator. But the solution isn't quite that simply. A normal chip isn't big enough to hold 20 microprocessors.

On the ENIAC, each accumulator communicated with the others. Because of its size, the chip will route information in a different fashion. Its "accumulators" will have restricted connections.

"This is similar to a telephone switching board, except on a silicon chip," Mr. Tau explained. "In the real world, the telephone company can build buildings as big as they want to encase their switchboards. They don't have any real area constraints. But on the silicon chip, that's a real big issue. So we have to figure out a way to minimize the connections, the switching, to achieve the level of communication we want be-

tween modules."

The chip may not be able to replicate the ENIAC precisely, but it will come close. "On the silicon chip, we are limited to the number of accumulators that one accumulator can communicate with," Mr. Tau said. "In that sense, the class of problems that our ENIAC can do may be limited, but we want our chip to do at least what the original ENIAC did, which is calculate the exterior ballistic equation."

The design of the chip will be finished in a couple of weeks, when it will be sent to a silicon foundry for fabrication. On Feb. 14, ENIAC's 50th anniversary, the students will be able to show the chip layout and the design of the different building blocks that constitute the full ENIAC.

The silicon foundry will need a few weeks to manufacture the chip. In the meantime, Deborah Seider, another electrical-engineering student, will keep busy writing software to program it. The software interface is her senior design project.

"We intend to build an ENIAC kit that

can be taken to museums and high schools to show how ENIAC works," Mr. Ang said.

Mr. Ang, along with Mr. Tau and Mr. Alailima, admits that they initially underestimated the sophistication of ENIAC. Still, they're learning a great deal from their experience, and they've gained a new appreciation for the scientists who built the world's first computer.

"One of the reasons why our goal was so ambitious at the start was that we didn't know very much about the ENIAC," Mr. Tau said. "In other words, we learned as we went along. ... So, in a sense, this is sort of like a research project, not just a recreation of something a bunch of brilliant people did 50 years ago."

"I've developed a lot of respect for the ENIAC," Mr. Alailima added. "It's a lot more than I initially thought it was. Modern hand calculators may have it beat for speed, but the ENIAC incorporated lots of features that disappeared from computing for a long while, but are now reemerging in cutting-edge technologies."

University of Pennsylvania Has the Write Stuff

Last week, best-selling author Terry McMillan came to the University as part of "A Mosaic of Black Writing" series sponsored by the Afro-American Studies Program. This week, award-winning playwright and screenwriter Tom Stoppard (*below*) is on campus.

Best known as the author of "Waiting to Exhale," Ms. McMillan spoke of her role

as producer of the movie version. She also treated the audience to a preview of her next book as she read from "How Stella Got Her Groove Back."

Mr. Stoppard is the featured speaker of the Steinberg Symposium, which runs until Thursday. From 4 to 5:30 p.m. today, Mr. Stoppard will be at the Harrison Auditorium. In his lecture, "Stage Directions," he

will address how a writer manipulates the events of a play and how directors make their con-

tributions.

English department chair Wendy Steiner joins him tomorrow in a discussion of late modernism and how the experience of modern society related to its art. They will appear at the Annenberg School Auditorium from 4 to 6 p.m.

On Thursday, Mr. Stoppard, other theatre professionals and scholars will discuss the current state of the theatre. Cary Mazer, chair of Penn's theatre arts program, will act as moderator at the discussion, which will be held from 4 to 5:30 p.m. in the Harrison Auditorium.

During his stay at Penn, Mr. Stoppard will participate in graduate and undergraduate classes, as well as share in lunches and dinners. Mr. Stoppard is no stranger to Penn students. His play "Arcadia" was the text for the 1995-96 Penn Reading Project, and 2,500 first-year students received a copy last summer.

For more information about Mr. Stoppard's residency, check out the Steinberg Symposium web page (<http://www.sas.upenn.edu/sasalum/steinberg/welcome.html>).



Photograph courtesy of Lincoln Center Theater



Terry McMillan photographs by Jenny Friesenhahn

Visionary Students Unite for Art

By Kirby F. Smith

They're on campus, and they're growing in number. Clever, creative, anonymous students who try to subvert ennui and indolence by infiltrating the University to present a different view of the world. Who are they, who walk among us, possessing another, more aesthetic agenda?

Now, look at the adjacent photo. You

don't have to be Sherlock Holmes to figure this one out. They're artists ... visual artists. And this is their story.

The Penn seniors in the picture are members of The Artist Guild, an undergraduate organization dedicated to increasing art awareness, creating a social and intellectual forum for artists, promoting and supporting student artists, and providing information about arts and cultural events on campus.

"When I was a freshman, I wanted to get involved with a visual-arts group," said senior Rori Duboff, president of the guild. "I have painted and been involved with the fine arts all my life. Although I did not choose to go to an art school, I was under the impression that a school as large as Penn should have some sort of fine-arts population. Much to my disappointment, there was a lack of an artistic community. There were many performing-arts groups, but none for the visual arts."

Ms. Duboff decided to do something about it during her second semester. She went to the Office of Student Life Activities and found out that another freshman, Salman Sajid, had just started a group with two roommates. Over the next three years, Ms. Duboff and a core group of students—Bryanna Millis, David Magid, Karey

Kessler and Adam Matta—assumed leadership roles and invigorated the organization, which now numbers 80 members.

Because the current leadership of the guild is composed of seniors, there had been some concern about finding members who would be willing to assume these positions. But the guild's future seems bright. Ms. Duboff said a few days ago that

new officers were just elected and that they are full of enthusiasm and energy. They are Diana Falchuk, president; Javier Villar, vice president; Abigail Feldman, curator; Carolyn Strom, manager; Karina Sliwinski, design and publicity; Rachel Kreps-Falk, treasurer; and Lesley Finn, secretary.

And that means more and more artists will be out in the open on campus. Already on their canvas are plans for a home page

for the guild, a female art project, an "art week," and numerous collaborative projects and public sculptural pieces.

Then again, the guild has always managed to keep busy: monthly meetings, three major exhibitions this academic year, a Halloween Masquerade Costume Extravaganza, organized First Friday gallery visits to Old City, and invitations to Members Previews of Institute of Contemporary Art exhibitions. On Dec. 1, Day Without Art/World Aids Day, The Artist Guild had a table in front of Claes Oldenberg's "Split Button" sculpture to help form the group that walked to the ICA, then traveled to John F. Kennedy Plaza for the rally. And then there was the winter show, "Giving Birth to Art," which clearly demonstrated the guild's dedication to the creative pro-

cess, as is evident from artist statements that accompanied the displays.

•**Rori Duboff:** "Always a battle. Back and forth, forward and skipping. Longing waiting swarming and sinking into the pins and needles that structure my life. Drip to a prism of colors to make it all glow once again please."

•**Diana Falchuk:** "Satisfaction: To be satisfied is to be neither repelled nor compelled. So, while it does not mean discomfort or disdain, regret, anger, sadness, frustration, or depression, it equally and unequivocally never can mean motivation, inspiration, drive, desire, or invigoration. There is no challenge in satisfaction. With satisfaction, there is no fulfillment because fulfillment, in its purest and most beautiful sweetness, only is tasted by those who search and question. To be satisfied is to relinquish the essence of human nature; a never-ending search for something more."

•**Jessica Kahn:** "The gliding sensation of hands curving forth the human form is the most soothing, creative high that I have ever experienced."

•**Janet Kim:** "Art is my own private bathysphere."

•**Bryanna Millis:** "Investigating environments, from my own interior to rooms, crowds, aspects of the larger world. I'm especially interested in the way these realms slip over into one another and the conflicts that occur at the borders."

•**Karina Sliwinski:** "The birth of anything abstract is no birth at all. Rather it is a conscious waking to find something that has always been there and that will always be there, changing as the mind awakes."

•**Victor Taylor:** "There is always an incomplete phase in any work of art. Eventually the form is released to perfection. A single moment can be reborn various times. The slightest manipulation of memory can create a completely opposite picture of reality."

•**Reza Alavi:** "I don't know how to explain in words. Look and find what you want to."

The winter show has closed, but The Artist Guild is already working on its spring show with a "next millennium" theme. It is planned for Houston Hall in April.



Photograph by Candace diCarlo

Surrounded by their works of art, members of The Artist Guild include Bryanna Millis (top left), Adam Matta (top right), Karey Kessler (middle), Rori Duboff (lower left), and David Magid (lower right).



OPPORTUNITIES at PENN

Listed below are the job opportunities at the University of Pennsylvania. To apply please visit:

University of Pennsylvania Job Application Center
Funderburg Information Center, 3401 Walnut Street, Ground Floor
Phone: 215-898-7285

Application Hours: Monday through Friday, 9 a.m.-1 p.m.

Positions are posted on a daily basis, Monday through Friday, at the following locations:

Application Center—Funderburg Center, 3401 Walnut St. (Ground level) 9 a.m.-1 p.m.

Blockley Hall—418 Guardian Drive (1st Floor and 2nd Floor)

Dental School—40th & Spruce St. (Basement-across from B-30)

Houston Hall—34th & Spruce St. (Basement-near the elevators)

Wharton—Steinberg Hall-Dietrich Hall (next to Room 303)

Job Opportunities and daily postings can also be accessed through the Human Resources Home Page (<http://www.upenn.edu/hr/>). A position must be posted for seven (7) calendar days before an offer can be made. The Job Opportunities Hotline is a 24-hour interactive telephone system. By dialing 898-J-O-B-S and following the instructions, you can hear descriptions for positions posted during the last three weeks. You must, however, have a push-button phone to use this line.

The University of Pennsylvania is an equal opportunity employer and does not discriminate on the basis of race, color, sex, sexual or affectional preference, age, religion, national or ethnic origin, disability or veteran status.

WHERE THE QUALIFICATIONS FOR A POSITION ARE DESCRIBED IN TERMS OF FORMAL EDUCATION OR TRAINING, PRIOR EXPERIENCE IN THE SAME FIELD MAY BE SUBSTITUTED. POSITIONS WITH FULL DESCRIPTIONS ARE THOSE MOST RECENTLY POSTED.

ARTS AND SCIENCES

Specialist: Nancy Salvatore

BUSINESS ADMINISTRATOR III/IV (0165NS) Responsible for personnel/payroll for the Department/all financial graduate funding; monitor & prepare budgets, reports; financial administration of Center & programs; supervise & train staff, assign duties & oversee office work flow; assist in preparation of research proposal; assist in preparation of dossiers for all appointments; schedule personnel visits; oversee course scheduling, preparation of graduate & undergraduate materials, follow through with student related problems; purchase equipment & supplies; payment of invoices & faculty reimbursements; assist the chairman with assigned duties; building administrator for Stiteler Hall. **Qualifications:** BA/BS preferably in accounting, business or equivalent; knowledge & experience with computerized accounting & managerial administration; thorough knowledge of area/departments & University policies & procedures (University accounting system & Human Resources policies & procedures) preferred. **BAIII:** at least three yrs. experience in accounting, business administration or equivalent. **BA IV:** Master's degree desired; at least four yrs. experience in accounting, business administration or equivalent. **Grade:** P4/P5; **Range:** \$26,200-34,100/\$28,800-37,600 1-29-96 Political Science **SECRETARY IV** (0181NS) Serve as department secretary; use of Word or WordPerfect in a Windows environment to compose, edit, type & proofread correspondence, reports & forms; maintain departmental files & address lists; handle student registration & grade changes; answer phones & take messages; maintain calendars for some faculty members; handle written & verbal inquiries about the department & graduate program. **Qualifications:** High school graduate or equivalent; some college preferred; at least two yrs. secretarial experience; ability to type at least 55 wpm.; proficiency in Windows environment; demonstrated ability to communicate effectively, handle multiple tasks simultaneously & work well under pressure. **Grade:** G9; **Range:** \$17,100-21,400 2-2-96 Folklore & Folklife **BUSINESS ADMIN. III/IV** (10513NS) P4/P5; \$26,200-34,100/\$28,800-37,600 1-5-96 Chemistry **COORD. I** (12668NS) (*Ongoing contingent upon funding*) P1; \$19,700-25,700 1-8-96 English Lang. Prog. **COORDINATOR III (MEDIA COORD.)** (0109NS) P3; \$23,900-31,000 1-11-96 SAS Computing **INFO. MANAGEMENT SPECIALIST I** (11589NS) P4; \$26,200-34,100 11-24-95 SAS Computing

INFO. SYSTEM SPECIALIST I (11548NS) P3; \$23,900-31,000 11-8-95 SAS Computing **PROGRAMMER ANALYST II** (09318NS) P6; \$31,900-40,600 9-12-95 IRIS **ADMINISTRATIVE ASS'T. II/III** (0110NS) G10/G11; \$18,700-23,300/\$19,900-25,300 1-12-96 Music **ADMIN. ASS'T. III** (0161NS) (*End date: 8/31/96*) G11; \$19,900-25,300 1-23-96 Romance Languages **LAB ASS'T. II** (10514NS) G8; \$15,700-19,600 10-31-95 Chemistry **SECRETARY V** (0112NS) G10; \$18,700-23,300 1-15-96 Office of the Dean

DENTAL SCHOOL

Specialist: Clyde Peterson

CLINICAL RECEPTIONIST (40 HR) (0173CP) Receive and register patients; make appointments; receive and record patients payments; maintain patient records; answer telephone; light typing and general office duties. **Qualifications:** H.S. grad. with two-four years exp. in clinical or practice setting; exp. with billing systems. (*Schedule 8:30 a.m.-5:30 p.m., possible Saturdays*) **Grade:** G8; **Range:** \$17,943-22,400 01-31-96 Dental Care Center **DENTAL ASS'T. I** (40 HRS) (07098CP) G7; \$16,571-20,686 7-24-95 Dental Medicine **DENTAL ASS'T. I** (40 HRS) (10429CP) G7; \$16,571-20,686 10-5-95 Dental Care Center **RECEPTIONIST II** (12629CP) G6; \$13,600-16,700 12-6-95 Coleman Center

ENGINEERING/APPLIED SCIENCE

Specialist: Clyde Peterson

SECRETARY IV (0176CP) Perform secretarial duties requiring the use of specialized/technical terminology; type standard and complex materials, maintain records and files; answer phones and handle inquiries, schedule meetings and conferences, handle mail and composing correspondence. **Qualifications:** H.S. diploma; business curriculum or equiv.; two years secretarial exp.; ability to type at least 55 wpm; must be computer literate and willing to learn LATEX (document preparation system), demonstrated understanding of punctuation and grammar; demonstrated ability to communicate effectively. **Grade:** G9; **Range:** \$17,100-21,400 01-31-96 Computer & Information Sciences **SYSTEMS PROGRAMMER II** (08055CP) (*Ongoing Contingent on Funding*) P7; \$35,000-43,700 5-17-95 CIS/IRCS

EXECUTIVE VICE PRESIDENT

Specialist: Nancy Salvatore/Susan Curran

DIRECTOR, CENTER TECHNOLOGY TRANSFER (0285NS) Manage the marketing & licensing of Intellectual Property cases with an emphasis on physical science discoveries; develop & negotiate related license & sponsored research agreements; provide guidance & technical assistance to fellow technology managers during the evaluation of inventions; work with the Managing Director & fellow technology managers to develop the overall strategy for managing the intellectual assets of the University. **Qualifications:** Advanced degree in physical science; five yrs. experience in new business development, new product development, technology management; expertise in contract negotiation, particularly with license & sponsored research agreement; excellent written & oral communication skills; requires an independent self-starter who can work well with others. **Grade/Range:** Blank 2-2-96 Center for Technology Transfer **DIRECTOR, CENTER TECHNOLOGY TRANSFER** (0286NS) Manage the marketing & licensing of Intellectual Property cases with an emphasis on life science; develop & negotiate related license & sponsored research agreements; provide guidance & technical assistance to fellow technology managers during the evaluation of inventions; external relationships with potential licensees & internal relationships with the faculty; provide guidance & technical assistance to fellow technology managers during evaluation of inventions. **Qualifications:** Advanced degree in life science; PhD preferred; extensive experience in new business development & new product development involving pre-clinical & clinical research; five yrs. technology management & contract negotiation, particularly with license & sponsored research agreement; excellent written & oral communication skills; requires an independent self-starter who can work well with others. **Grade/Range:** Blank 2-2-96 Center for Technology Transfer **MANAGER, MARKETING & ADMINISTRATION** (0287NS) Responsible for administrative support to facilitate operations & for coordination of internal & external marketing activities in the Center; assist the Managing Director for Technology Transfer by overseeing the daily administrative activities; oversee & participate in special projects; coordinate marketing activities of the Center; provide data for various marketing programs; prepare non-confidential summaries & confidential information packets. **Qualifications:** BA/BS or equivalent work experience; minimum seven yrs. high level office admin. exp.; two yrs. supervisory exp.; three yrs. directly related experience in a marketing environment; ability of work on multiple projects concurrently; word processing & spreadsheet skills; excellent written & oral communication skills; good organizational skills. **Grade:** P8; **Range:** \$38,500-48,100 2-2-96 Center for Technology Transfer **PLUMBER** (0170NS) Installation of copper tubing & sweat copper fittings; install soil pipes rough-in for plumbing fixtures; wipe lead joints; cut & thread steel pipe & do chrome finish work. **Qualifications:** H.S. grad.; completion of approved apprenticeship prog.; five yrs. exp. as a journeyman plumber; current license by City of Philadelphia; valid driver's license pref. **Grade/Range:** Union 1-30-96 Physical Plant **ASSOC. DIRECTOR, INFO. SYSTEM** (11603NS) P11; \$54,500-68,200 11-29-95 Internal Audit **AUDITOR, SR. INFO. SYSTEMS** (12632NS) P8; \$38,500-48,100 12-7-95 Internal Audit **AUDITOR, SR. INFO. SYS.** (12644NS) (12645NS) P8; \$38,500-48,100 12-11-95 Internal Audit **AUDIT SPECIALIST** (10502NS) P9; \$42,300-52,900 10-27-95 Internal Audit **COORDINATOR III** (0134NS) P3; \$23,900 - 31,000 1-16-96 Public Safety **DIR., FINANCE & INFO. SYSTEMS** (11614NS) P8; \$38,500-48,100 11-30-95 Business Services **DIR., INTELLECTUAL PROPERTY** (12673NS) P11; \$54,500-68,200 1-5-96 Ctr. for Technology Transfer **DIR., START-UP BUSINESS DEV.** (12674NS) P10; \$47,400-59,200 1-5-96 Ctr. for Technology Transfer **MANAGER, ACCOUNTING OPERATION II** (11609NS) P8; \$38,500-48,100 11-29-95 Comptroller's Office **PROGRAMMER ANALYST II** (11561SC) P6; \$31,900-40,600 11-15-95 HRIM

ADMIN. ASS'T. III (40 HRS) (09341NS) G11; \$22,743-28,914 12-4-95 Executive Vice President
ADMIN. ASS'T. III (37.5 HRS) (0132NS) G11; \$21,321-27,107 1-15-96 Business Services
FINANCIAL SERVICES ASS'T. II (11615NS) G10; \$18,700-23,300 12-1-95 Student Financial Services
TEACHER, CHILDREN'S CTR. (0133NS)(Schedule: variable, 7:30 a.m.-6 p.m. Center hours) **Grade:** G11; **Range:** \$19,900-25,300 1-15-96 Penn Children Ctr.

GRAD SCHOOL OF EDUCATION

Specialist: Clyde Peterson

SEC'Y IV (0174CP) Under the direction of Consortium for Policy Research in Education (CPRE) coordinator, secretary will serve as office receptionist; maintain CPRE publication database, incl. filling publication orders; perform general secretarial tasks as assigned; schedule research field visits for faculty; maintain bibliographic database; assist with meeting arrangements. **Qualifications:** Completion of HS Business Curriculum or equiv.; at least two yrs. prior secretarial exp.; excellent computer skills, particularly with Windows software; WordPerfect 5.2 or greater; excellent verbal/written communication skills & good organizational skills. (End date: *Contingent on funding*) **Grade:** G9; **Range:** \$17,100-21,400 01-31-96 CPRE
ADMINISTRATIVE COORDINATOR (12683CP) P4; \$26,200-34,100 1-4-96 CUE/C-FCEDRE
ASSOCIATE DIRECTOR NCAL (08267CP) Blank 8-30-95 National Center on Adult Literacy
INFO. MGMT. SPECIALIST I (10490CP) P4; \$26,200-34,100 10-20-95 GSE/Computing Resources
ADMIN. ASS'T. I/II (12681CP) G9/G10; \$17,100-21,400/18,700-23,300 1-3-96 Phila. Writing Project
SECRETARY IV (12682CP) G9; \$17,100-21,400 1-3-96 CFCEDRE

GRAD SCHOOL OF FINE ARTS

Specialist: Clyde Peterson

P-T (OFFICE ADMIN. ASS'T. I) (24HRS) (12631CP) (End date: 6-30-96) G9; \$9,396-11,758 12-7-95 Arch.

LAW SCHOOL

Specialist: Clyde Peterson

ANNUAL GIVING OFFICER II (11582CP) P5; \$28,800-37,600 11-22-95 Law Development
FINANCIAL ADMINISTRATOR II (0124CP) P4; \$26,200-34,100 1-19-96 Dev. & Alumni Relations
P-T (ADMIN. ASS'T. II) (28 HRS) (05003CP) (*Ongoing contingent on funding*) G10; \$10,275-12,802 6-8-95 Institute for Law & Economics

MEDICAL SCHOOL

Specialist: Ronald Story/Janet Zinser

RESEARCH SPECIALIST I (0156RS) Assist residents & participate in surgical experiments; prepare for daily experiments; learn new medical related techniques & concepts; order supplies & equipment; conduct library searches; input computer data. **Qualifications:** BA/BS in science or related field; background in physiology helpful; one-three yrs. exp.; exp. on extracorporeal perfusion desirable. (*Ongoing contingent upon grant funding*) **Grade:** P2; **Range:** \$21,700-28,200 1-23-96 Surgery/HDSR
RESEARCH SPECIALIST I (0167RS) Perform experiments in cell culture, molecular biology assays, small animal surgeries, isotopic kinetic studies & biochemical assays; maintain lab equipment & supplies; assist in writing procedural section in publication & grant application and assist with drafting protocols; perform library bibliographic search; keep logs & write lab reports; input computer data, demonstrate techniques, attend lab meetings; prepare specialized intravenous & enteral metabolic diets. **Qualifications:** BA/BS in biochem.; two yrs. lab exp.; exp. in biochem. & molecular bio. techniques; familiarity with cell culture & animal operation procedures. (*Ongoing contingent upon grant funding*) **Grade:** P2; **Range:** \$21,700-28,200 2-2-96 Surgery
RESEARCH SPECIALIST II (0154RS) Perform structural studies on blood clotting; prepare fibrin clots & thrombi for scanning electron microscopy; examine & photograph samples; prepare rotary shadowed indi-

vidual molecules & examine using transmission electron microscopy; maintain lab notebooks; analyze image data; maintain & order lab supplies. **Qualifications:** BS in biological, biophysical or biochemical sciences; three-five yrs. exp.; research exp. in structural biology necessary; exp. with scanning & transmission electron microscopy pref. (End date: 1/31/97) **Grade:** P3; **Range:** \$23,900-31,000 1-29-96 CDB
RESEARCH SPECIALIST II (0155RS) Assist in overall management of DNA sequencing facility; perform sequencing reaction; run gels; analyze & assemble results; manage projects; provide consultation & training to facility users & junior staff; develop new procedures; maintain equipment; write procedures & maintain logs. **Qualifications:** BS in biological field plus three-five yrs. experience in similar project. **Grade:** P3; **Range:** \$23,900-31,000 1-29-96 Genetics
COLLECTION ASS'T. (40 HRS) (08276JZ) Prepare all third-party insurance forms to assure a consistent, timely cash flow; liaison with insurers; handle patient inquiries; monitor and follow-up on insurance payments; monitor and maintain log on all monies due; file and post payments and review to ascertain eligibility to receive payment and apply proper modifier to procedure code for collection purposes. **Qualifications:** HS diploma; one year related experience; knowledge of third-party collections and medical billing necessary; excellent telephone skills and familiarity with CRT printer and PC mainframe. **Grade:** G10; **Range:** \$21,371-26,629 1-30-96 Ophthalmology
RES. LAB TECH III (0159RS) Raise, maintain & organize zebrafish mutant stocks; raise rotifer & brain shrimp cultures; perform genetic & embryological manipulations of developing zebrafish embryos; order & maintain related supplies; perform general lab duties & library searches. **Qualifications:** BA/BS in biology, biochem. or genetics; some lab. exp. pref. **Grade:** G10; **Range:** \$18,700-23,300 1-25-96 CDB
RESEARCH LAB TECH III (40 HRS) (0169RS) Perform biochemical assays, HPLC, ELISA & operate & maintain lab equipment; keep logs & prepare reports; maintain inventory & order supplies; input computer data; perform library searches. **Qualifications:** BA/BS with a science major pref. in biology or biochemistry; some experience in performing biochemical assays, HPLC or ELISA. (*Ongoing pending funding*) **Grade:** G10; **Range:** \$21,371-26,629 2-1-96 Ctr. for Experimental Therapeutics & Clinical Research Ctr.
P-T (RESEARCH LAB TECH II) (28 HRS) (0168RS) Assist in conducting experiments under general supervision; form blood clots in test tube & study their lysis by ultrasound; conduct phantoms for imaging experiments; log data into computer; conduct library searches; maintenance of lab. **Qualifications:** H.S. diploma or equiv.; prior exp. in lab. or basic research; familiarity with computers. (*Ongoing contingent on funding*) **Grade:** G7; **Range:** \$7,697-9,945 2-1-96 Radiology
ASS'T. MANAGER II (05057JZ) P2; \$21,700-28,200 5-18-95 Ophthalmology
CLINICAL SPECIALIST (11538RS) (End date: *pending funding*) P6; \$1,900-40,600 11-9-95 Medicine/Experimental Therapeutics
COORDINATOR III (12646JZ) P3; \$23,900-31,000 12-14-95 Biomedicine Graduate Studies
FISCAL COORDINATOR II (11620JZ) (End date: 12/31/97) P2; \$21,700-28,200 12-1-95 IHGT
MANAGER VI (11619RS) (End date: 12/31/97) P7; \$35,000-43,700 12-1-95 IHGT
PROGRAMMER ANALYST I (11581JZ) P4; \$26,200-34,100 11-22-95 Psychiatry
PROGRAMMER ANALYST III (10447JZ) P7; \$35,000-43,700 10-25-95 General Medicine
PROGRAMMER ANALYST III (0120JZ) P7; \$35,000-43,700 1-15-96 Psychiatry
PROGRAMMER ANALYST IV (0160JZ) (End date: 1/31/98) P8; \$38,500-48,100 1-25-96 IHGT
PROJECT MANAGER II (10445RS) P7; \$35,000-43,700 10-10-95 Cancer Center
REIMBURSEMENT ANALYST I (05104JZ) P6; \$31,900-40,600 9-8-95 Medicine/Billing
RESEARCH COORDINATOR (10442RS) P3; \$23,900-31,000 10-10-95 Cancer Center
RESEARCH COORDINATOR (11543RS) P3; \$23,900-31,000 11-7-95 Pathology & Lab Medicine
RESEARCH COORDINATOR, SR. (06006RS) P4; \$26,200-34,100 11-6-95 Radiation Oncology
RESEARCH SPECIALIST, JR. (10428RS) (End date: 10/31/97) P1; \$19,700-25,700 10-6-95 IHGT

RESEARCH SPECIALIST JR./I (0118RS) (*On-going contingent upon grant funding*) P1/P2; \$19,700-25,700/21,700-28,200 1-12-96 Path. & Lab Medicine
RESEARCH SPECIALIST I (08206RS) P2; \$21,700-28,200 9-26-95 Medicine/Renal
RES. SPEC. II (0130RS) (Schedule: M-F, 8 a.m.-5 p.m.) (End date: 1/31/98) P3; \$23,900-31,000 1-15-96 IHGT
RESEARCH SPECIALIST III (08240RS) P4; \$26,200-34,100 9-7-95 Radiology
RESEARCH SPECIALIST III (11621RS) P4; \$26,200-34,100 12-11-95 Cancer Center
RESEARCH SPECIALIST IV (10509RS) (End date: 6/30/98) P6; \$31,900-40,600 10-30-95 IHGT
ADMINISTRATIVE ASS'T. II (40 HRS) (11594JZ) G10; \$21,371-26,629 11-30-95 Psychiatry
ADMIN. ASS'T. III (37.5 HRS) (11596JZ) G11; \$21,321-27,107 11-30-95 Continuing Med. Educ.
CLERK IV (40 HRS) (0129JZ) (Schedule: M-F, 9-6) (End date: 1/31/98) G7; \$16,571-20,686 1-22-96 IHGT
CLINICAL RECEPTIONIST (40 HRS) (11540JZ) G8; \$17,943-22,400 12-8-95 Ophthalmology
OFFICE ADMINISTRATIVE ASS'T. I (0145JZ) G9; \$17,100-21,400 1-18-96 Biomed. Grad. Studies
OFFICE ADMIN. ASS'T. III (0128JZ) (End date: 6/30/96) G11; \$19,900-25,300 1-16-96 Psychiatry
OPERATOR, COMP COMP II (09353JZ) G10; \$18,700-23,300 9-19-95 CCEB
OPERATOR, DATA ENTRY (0127JZ) (End date: 6/30/96) G7; \$14,500-18,100 1-15-96 Psychiatry
RESEARCH LAB TECH III (40 HRS) (08174RS) G10; \$21,371-26,629 8-8-95 Anesthesia
RESEARCH LAB TECH III (09310RS) (*On-going contingent upon grant funding*) G10; \$18,700-23,300 9-11-95 Pathology & Lab Medicine
RESEARCH LAB TECH III (10475RS) (*On-going contingent upon grant funding*) G10; \$18,700-23,300 10-16-95 Pathology & Lab Medicine
SCIENTIFIC EQUIPMENT STERILIZATION ATTENDANT (40 HRS) (0146RS) G5; \$14,286-17,486 1-18-96 Center for Experimental Therapeutics
SECRETARY, SR. (05083JZ) G11; \$19,900-25,300 10-26-95 Vice Dean for Education
TECH, PSYCHI (0105RS) G10; \$18,700-23,300 1-8-96 Psychiatry
PART-TIME (SCIENTIFIC EQUIPMENT STERILIZATION ATTENDANT) (20 HRS) (11622RS) G5; \$6,868-8,407 12-1-95 Cancer Center

NURSING

Specialist: Ronald Story

PROJECT MANAGER (0108RS) Supervise research and community-based staff to ensure fidelity of research implementation and coordinate multifaceted research activities; manage and supervise participants recruitment, retention, tracking procedures; develops and implement a protocol for managing intervention sessions and data collection; exercise resource stewardship; ensure compliance with related University policies and procedures. **Qualifications:** Master's degree in nursing, psychology, public health, social work, business administration or related field, with five or more yrs. of professional experience working in African American communities; driver's license, access to car, ability to work on Saturday's and proficiency with Macintosh computers required. **Grade:** P7; **Range:** \$35,000-43,700 1-12-96 Nursing
RESEARCH SPECIALIST I/II (0179RS) Solve/supervise procedural problems; plan for protocol; research specific experimental design; perform data analysis; conduct bibliographic searches. **Qualifications:** BA/BS in scientific field; experience in molecular biology and exposure to independent lab work; Research Specialist I - one to three years experience; Research Specialist II - three to five years experience. **Grade:** P2/P3; **Range:** \$21,700-28,200/ \$23,900-31,000 01-31-96 Hematology
RESEARCH SPECIALIST III (0163RS) Manage large data base; conduct multi-value analyses & provide computer programming support health services research projects; assist principal investigator with research design, methodology & statistical issues; perform general & professional functions; in connection with the above including preparation of project reports & professional papers. **Qualifications:** BA/BS required; MA/MS in a health services research, population studies or social science field preferred; prior experience as a data analyst or statistical programmer in a research environment, preferably in health ser-

vices; demonstrated competence in research methodology, analytical approach & computer application in the health field; experience working with large data bases & statistical analytical software (preferably SAS & STATA); strong organizational & communication skills; ability to work effectively within an interdisciplinary research team. (End date: *Dependent on continued research funding*) **Grade:** P4; **Range:** \$26,200-34,100 1-29-96 Nursing

RESEARCH SPECIALIST IV (0107RS) Develop intervention curriculum to reduce the risk of HIV infection, unintended pregnancy, heart disease and cancer; design training manuals, train and supervise facilitators. **Qualifications:** Master's Degree in Education, Psychology, Public Health, Nursing, or related field and four or more years of professional experience working in African American Communities; a valid drivers license, access to car; proficiency with Macintosh computers; *must be able to work some Saturdays.* **Grade:** P6; **Range:** \$31,900-40,600 1-16-96 Nursing School

PART-TIME (ADVANCE PRACTICE NURSE) (20 HRS) (0149RS) Provide gerontologic nursing consultation to hospital and nursing staff, patient-subjects & their families; promote high quality individualized care with/without minimum usage of physical restraint; act as liaison between nursing home and hospital staff; deliver education programs to hospital staff regarding quality gerontological care. **Qualifications:** Master's degree in nursing with speciality in gerontology preferred; one yr. post-MSN degree in advanced practice role; two yrs. experience in hospital experience as nurse. (End date: 5/97) **Grade:** P9; **Range:** \$24,170-30,233 1-22-96 Nursing

ADMINISTRATIVE ASS'T. II (12685RS) *both male and female minority candidates are encouraged to apply; ability to work some Saturdays* (End date: 9/30/2000) G10; \$18,700 - 23,300 1-4-96 Nursing

SECRETARY IV (12684RS) *both male and female minority candidates are encouraged to apply; ability to work on Saturdays* (End date: 9/30/2000) G9; \$17,100 - 21,400 1-4-96 Nursing

PART-TIME (SECRETARY IV) (21 HRS) (0140RS) G9; \$9,396-11,758 1-18-96 Nursing

PRESIDENT

Specialist: Susan Curran/Janet Zinser

DIRECTOR, NEW YORK CITY REGION (0164JZ) Oversee major gift fundraising in the New York region (North Jersey, New York City & surrounding counties & Southern Connecticut); cultivate & solicit alumni, parents & friends of the University for major gifts (\$25,000 or more); recruit, train & staff volunteers; manage office & staff; design & conduct cultivation events & assist alumni relations activity; serve as an active participant on matters related to department-wide strategic planning & management issues. **Qualifications:** BA/BS or equivalent; eight-ten yrs. experience in development, sales, marketing, public relations or related field, with at least five-seven yrs. experience in fundraising including direct solicitation of major gifts; understanding of higher education, especially major research universities; excellent interpersonal, oral & written communications skills; willingness to travel frequently; valid driver's license; experience in managing staff, volunteers & budget accountability. (Position in New York) **Grade:** P11; **Range:** \$54,500-68,200 1-29-96 Dev. & Alumni Rels.

DIR., REGIONAL DEVELOPMENT (0175JZ) Oversee major gift fundraising in the western region (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming.) Cultivate and solicit alumni parents and friends of the University for major gifts (\$25,000 or more.) Recruit, train and staff volunteers; manage office and staff; design and conduct cultivation events and assist alumni relations activity. **Qualifications:** BA/BS; seven yrs. exp. in dev., sales, marketing, public relations or related field, with at least four years exp. in fundraising including direct solicitation of major gifts; understanding of higher ed., esp. major research universities; excellent interpersonal and communications skills, both oral and written; willingness to travel frequently; valid drivers license; exp. in managing staff, volunteers and budget accountability. **Grade:** P10; **Range:** \$47,400-59,200 01-31-96 Dev & Alumni Relations

PROGRAMMER ANALYST I (08194JZ) Create fundraising and alumni relations reports from Ingres database using SQL and "C" language; create parameterized report programs for use of staff, using in-house report manager reporting needs, designs, codes, documents, test and debugs programs; write programs to extract data from mainframe; interact with staff to determine department's needs; write one-time ad hoc reports and programs as needed. **Qualifications:** BA/BS required, pref. in computer science or management info. systems; one-two yrs. exp. using relational database management systems (Ingres); two yrs. exp. in designing, coding, testing, debugging and documenting structured software programs; experience in using high level programming language desirable; strong analytical skills; Unix exp. pref.; familiarity with desktop computing; exp. in fundraising info. systems desirable; demonstrated ability to design and execute programs with minimal technical supervision; good interpersonal and communication skills. **Grade:** P4; **Range:** \$26,200-34,100 1-31-96 Dev. & Alumni Rels.

ASS'T. DIRECTOR IV/ASSOCIATE DIRECTOR V (12653JZ) P5/P7; \$28,800-37,600/\$35,000-43,700 12-14-95 Development & Alumni Relations

ASSOC. DIR. INDIVIDUAL GIFTS (09366JZ) P7; \$35,000-43,700 9-21-95 Dev. & Alumni Relations

DEVELOPMENT OFFICER II (07082JZ) P10; \$47,400-59,200 7-19-95 Dev. & Alumni Relations

DIRECTOR ALUMNI RELATIONS (09309JZ) P11; \$54,500-68,200 9-7-95 Dev. & Alumni Relations

DIR., DEVELOPMENT RESEARCH (11585JZ) P8; \$38,500-48,100 11-22-95 Dev. & Alumni Relations

DIRECTOR, UNIVERSITY COMMUNICATIONS (10473SC) Blank 10-18-95 University Relations

EDITOR, ALUMNI MAGAZINE (11572JZ) P9; \$42,300-52,900 11-16-95 Dev. & Alumni Relations

EXEC. DIR. RESOURCE, PLANNING & BUDGET (09344SC) Ungraded; Blank 9-14-95 President's Office

PROGRAMMER ANALYST I (08194JZ) P4; \$26,200-34,100 8-11-95 Development & Alumni Relations

PUBLICATIONS DESIGN SPECIALIST (10449JZ) P5; \$28,800-37,600 10-10-95 Dev. & Alumni Rels.

SENIOR WRITER (11584JZ) P7; \$35,000-43,700 11-22-95 Development & Alumni Relations

STAFF WRITER II (04062JZ) (Two Writing Samples Must Accompany Application) P3; \$23,900-31,000 4-24-95 Development and Alumni Relations

PROVOST

Specialist: Clyde Peterson

PROG. ANALYST III (0172CP) Develop requirements for new applications and/or enhancements to existing applications; analyze and design the technical implementation of specified applications; develop programming specifications and effort estimated to facilitate project scheduling; prepare program and operational documentation; participate with DCCS Engineering staff in system test/installation/ deployment; maintain a state-of-the-art knowledge of the University's technical architecture, systems development tools, and new technologies. **Qualifications:** BA/BS degree or equiv.; pref. in Computer Science; four years of exp., in applications dev., heterogeneous multi-vendor; networked; and distributed computing environments; detailed knowledge of C/UNIX environments and relational database technologies (Oracle, Ingres, Sybase); excellent written, oral and interpersonal skills. **Grade:** P7; **Range:** \$35,000-43,700 01-31-96 Data Comm & Computing Svcs

ADMIN. ASS'T. II (0162CP) Provide administrative & clerical support for the Penn Relays program; coordinate projects related to the organization and administration of all sport programs as assigned. **Qualifications:** High school diploma required; minimum two yrs. exp. at the AAI level; type with speed/accuracy; ability to communicate effectively orally & in writing; strong PR skills; willingness to work extra hours during peak times; PC compatible skills required. **Grade:** G10; **Range:** \$18,700-23,300 1-29-96 DRIA

OFFICE ADMIN. ASS'T. I (0114CP) Process requisition for accounts payable, including travel advances, reconciliations & reimbursements; process invoices for Photo Studio & Photo Archives; monitor & process other dept. deposits; maintain petty cash fund; review monthly budget summaries; operate computer to extract budgetary info.; may handle payroll duties in absences of other business office personnel. **Qualifications:** H.S. grad.; some college pref.; one-two yrs. office exp.; ability to type with speed & accuracy; computer familiarity; excellent communication skills. **Grade:** G9; **Range:** \$17,100-21,400 2-1-96 Museum

ASS'T. COACH I (07132CP) P3; \$23,900-31,000 7-28-95 DRIA

CHAPLAIN (08247CP) Ungraded 8-23-95 Provost's Office

COORDINATOR V (0151CP) P5; \$28,800-37,600 1-25-96 Provost's Office

INFO. SYSTEMS SPECIALIST I (12659CP) (May involve some evenings or weekends hours) P3; \$23,900-31,000 12-19-95 CRC

JUDICIAL INQUIRY OFFICER (12665CP) P8; \$38,500-48,100 12-21-95 Provost's Office

PROGRAMMER ANALYST II (09365CP) P6; \$31,900-40,600 9-21-95 IRHE

RESEARCH SPECIALIST IV (08303CP) P6; \$31,900-40,600 9-7-95 LRSM

SYSTEMS ANALYST II (11558CP) P7; \$35,000-43,700 11-10-95 UMIS

SYSTEMS PROGRAMMER IV (12633CP) P9; \$42,300-52,900 12-7-95 DCCS

TECHNOLOGY TRAININGSPECIALIST (06085CP) P5; \$28,800-37,600 6-21-95 Tech. Learning Services

VICE PROVOST FOR RESEARCH (08248CP) Ungraded 8-25-95 Provost's Office

PART-TIME (LIBRARIAN II) (0141CP) (20 HRS) P5; \$16,453-21,486 1-26-96 University Libraries

ADMIN. ASS'T. III (11611CP) G11; \$19,900-25,300 11-29-95 University Libraries/Reference

EDITORIAL ASS'T. I (10461CP) G10; \$18,700-23,300 10-16-95 University Press

SECRETARY IV (11606CP) G9; \$17,100-21,400 12-6-95 Student Dispute Resolution Center/JIO

TECH, ELECTRONIC III (03006CP) G11; \$19,900-25,300 3-3-95 DCCS

TECH, VET II (40HRS) (12658CP) (Schedule: 7:30-4:30 p.m., may include weekends, holidays & overtime) **Grade:** G10; **Range:** \$21,371-26,629 12-21-95 ULAR

P-T (ADMIN. ASS'T. I) (20 HRS) (10507CP) G9; \$9,396-11,758 10-27-95 Special Collections-University Libraries

P-T (PHOTOGRAPHER I) (20 HRS) (11605CP) G7; \$7,967-9,945 11-29-95 Univ. Libraries-Fine Arts/Slide Collections

(Opportunities continue next page)

Classifieds

FOR SALE

Wilmington - 50 min. from Penn. 4 BR, 3 BA colonial in quiet suburban area on 1/2 acre. \$194,000. Call 898-3632 (days), (302) 239-4742 (eves.)

VACATION

Pocono Chalet, 3 bedrooms, one bath. Near Jack Frost/BB. Firewood incl. \$350/weekend. (215) 573-9048.

POSITION AVAILABLE

Two Year Research Position, Visual Acuity Tester. (Start Date: May 1, 1996) The Children's Hospital of Philadelphia, Division of Ophthalmology, Assist with visual acuity research on federally-funded vision study; receive training in vision assessment protocol; administer battery of visual acuity tests to ten year-old patients at 23 centers in nationwide study; prepare visual acuity data and reports; perform record-keeping tasks related to the grant. Extensive travel required. **Qualifications:** College degree preferred with strong organizational skills, ability to work independently as part of a team, ability to interact effectively with children and with various hospitals/offices to arrange patient visits, willing to travel. To apply, please send resume to Linda Parris, Children's Surgical Associates, 34th & Civic Center Blvd., Philadelphia, PA 19104 or fax resume: (215) 386-4036. **Range:** \$33,000-38,000.

Note: Classifieds are accepted and compiled at the offices of The Compass. Call 898-8721 for rates and procedures.

Home-Buying Seminars and Mortgage Counseling Sessions

The Office of the Treasurer will sponsor brown-bag lunchtime home-buying seminars on March 11, 13, 14, 15, 25, 27, and 28.

Each seminar will consist of two sessions, the first beginning at noon and the second at 1 p.m., and will be held in Room 720 of the Franklin Building.

In addition, the Treasurer's Office will sponsor mortgage counseling sessions on April 2, 4, 10, 12, 16, 17, 22, 24, and 26. During these sessions, individuals will meet one-on-one with a mortgage banker to discuss their personal home-buying needs. Scheduled times for these dates are 12:15 p.m., 1:15 p.m., 2:15 p.m., 3:15 p.m., and 4:15 p.m.

Those interested in participating should call Jean Suta at 898-7256 to obtain information and make reservations.

Trustees Council of Penn Women: Summer Research Stipends

The Trustees Council of Penn Women awards two \$3000* summer research stipends to female faculty members or faculty members whose research directly affects women. These awards are given to assist in the promotion of standing faculty to the permanent rank of Associate Professor.

Those interested in applying for the stipend should submit a one to two page summary of the research they wish to undertake, an explanation of how the stipend will facilitate the research, a curriculum vitae, and the name of a University reference. In the application, it should be stressed how the award will be used and why it would be particularly useful at this time. The summary should be sent to Dr. Demie Kurz, co-director, Alice Paul Research Center, Suite 590, 3440 Market Street/3325 no later than *March 4, 1996*.

Research proposals will be reviewed, and the stipend awarded, through a peer review process. It is expected that the research, or a significant subset thereof, will be concluded during the summer of 1996, and a written report will be submitted to the review panel and to the Trustees' Council. Any subsequent publication of the research results will acknowledge the support of the Council.

* Note: Taxes and Benefits are deducted from the awards.

OPPORTUNITIES at PENN

VETERINARY SCHOOL

Specialist: Nancy Salvatore

LARGE ANIMAL ATTENDANT I/II (40 HRS) (0166NS) Perform variety of duties involving care & feeding of large animals & the cleaning & general up keep of stall facilities provides general housekeeping & grounds keeping; moves animal patients to/from surgery area and/or recovery room; assist in monitoring general health conditions; position/assist with patients in operating room; use variety of equipment including forklift, dump truck, compactor & tractor. **Grade:** H.S. graduate or equivalent; knowledge of husbandry; mechanical aptitude; ability to work with minimal supervision; valid driver's license; ability to lift up to 75lbs.; familiarity with dairy cows helpful; familiarity with infectious disease & nutrition helpful.

LAAL: one-three yrs. exp. working with large animals. **LAAL:** three-five yrs. exp. working with large animals. (flexible hours-overtime & on-call) (Position in Kennett Square, PA; no public transportation) **Grade:** G5/G7; **Range:** \$14,286-17,486/\$16,571-20,686 1-29-96 Large Animal Hospital

RES. SPECIALIST JR/I (12671NS) P1/P2; \$19,700-25,700/ 21,700-28,200 1-3-96 Clinical Studies

RESEARCH SPECIALIST I (12680 NS) P2; \$21,700-28,200 1-3-96 Pathobiology

RESEARCH SPECIALIST I (08190NS) P2; \$21,700-28,200 8-11-95 Pathobiology

LAB ASS'T. II (09327NS) G8; \$17,943-22,400 9-13-95 VHUP-CLM

LARGE ANIMAL ATTENDANT I (40 HRS) (0148NS) (Position in Kennett Square, PA; no public transportation) G5; \$14,286-17,486 1-19-96 Large Animal Hospital

SEC'Y IV (40 HRS) (0144NS) (Schedule: M-F, 8:30 a.m.-5 p.m.) G9; \$19,543-24,457 1-18-96 Fac. Mgmt.

SECRETARY V (11532NS) G10; \$18,700-23,300 11-7-95 Small Animal Hospital

TECH, HISTOLOGY I (0121NS) (Work schedule: 8-4) G7; \$14,500-18,100 1-15-96 Pathobiology

TECH, VET I/II (40 HRS) (0142NS) (0143NS) (Position in Kennett Square, PA; no public transportation) G8/G10; \$17,943-22,400/\$21,371-26,629 1-18-96 Large Animal Hospital

VICE PROVOST/UNIVERSITY LIFE

Specialist: Clyde Peterson

ASS'T. DIRECTOR RESIDENTIAL MAINTENANCE (07043CP) (End date: 6/30/97) P6; \$31,900-40,600 7-13-95 Residential Maintenance

ASS'T. MANAGER RADIO STATION (0101CP) (End

Date: 12/31/96) P6; \$31,900-40,600 1-3-96 WXPNDIR., FRATERNITY & SORORITY AFFAIRS (12651CP) P8; \$38,500-48,100 12-13-95 VPUL

UPWARD BOUND COUNSELOR (12650CP) (Work schedule: Tues.-Sat.) (End date: Grant supported, ongoing continuation contingent on funding) P3; \$23,900-31,000 12-13-95 Academic Support

ADMIN. ASS'T. I (0139CP) G9; \$17,100-21,400 1-22-96 Greenfield Intercultural Center

MASON (0138CP) Union 1-22-96 Resid. Maint.

OFFICE ADMINISTRATIVE ASST III (0137CP) G11; \$19,900 - 25,300 1-16-96 International Programs

PAINTER (0135CP) Union 1-22-96 Resid. Maint.

STEAMFITTER (0136CP) Union 1-22-96 Residential Maintenance

WHARTON SCHOOL

Specialist: Janet Zinser

ASS'T. DIRECTOR III (0180JZ) Coordinate & oversee all activities of Wharton Center for Quantitative Finance; serve as primary contact for Center; responsible for financial management, budgeting & reporting; plan & execute Center conferences & activities; fundraise & manage membership activities; perform administrative duties, including typing, filing, answering phone & preparing academic materials; coordinate Director's interaction with University & outside organization; supervise work study students. **Qualifications:** BA/BS or equiv.; three-five yrs. admin. & coordination experience; excellent interpersonal, organizational & written/verbal communication skills; working knowledge of word-processing, spreadsheet & database management software, preferably Microsoft Word, Excel & Access; supervisory experience; ability to handle multiple projects simultaneously; ability to deal with a diverse population. **Grade:** P4; **Range:** \$26,200-34,100 2-2-96 Finance

COORDINATOR III (0177JZ) Responsible for full project of senior executive education program; coordinate, organize & run the program; provide administrative support to director of corporate programs & peripheral support to Vice-Dean; work directly with senior corporate executives, consultants, faculty & external vendors. **Qualifications:** BA/BS or equivalent required; three-five yrs. experience coordinating conferences or management training programs &/or administrative support at the senior executive level; excellent oral & written communication skills; PC experience with WordPerfect & Lotus for Windows; excellent organizational & analytical skills. **Grade:** P3; **Range:** \$23,900-31,000 2-1-96 Aresty Institute

OPERATOR, DUP MACHINE IV (10529JZ) Perform all routine functions of the Xerox Network Publishing System including image merge, cut and paste, crop, rotate and mask images for reproduction and release network orders using the Novell and Xerox servers; perform all routine and advanced functions on the Xerox 5775 Network Color Laser Printer; Kodak 2110 Duplicator and other bindery equipment contained within Wharton Reprographics; perform routine maintenance of the DocuTech Publishing Systems. **Qualifications:** High school graduate or equivalent; two-four yrs. experience operating high speed copiers/duplicators or equivalent, Xerox 5390 and Kodak 2110 preferred; six months experience with Xerox DocuTech Publishing System and successful completion of the DocuTech training program; highly proficient in Math and English; computer experience with MS Windows 3.1 including DOS commands, file manager and program manager; knowledge of desktop publishing, preferably Aldus PageMaker, Adobe Photoshop or Adobe Illustrator; ability to lift up to fifty pounds (No vacation will be approved during Aug., Sept., Dec. and Jan.) (Overtime is a requirement of this position) (Schedule: 5 p.m.-1 a.m.) **Grade:** G10; **Range:** \$18,700-23,300 01-31-96 Repro.

DIR. VII (11535JZ) P10; \$47,400-59,200 11-8-95

INFO. MANAGEMENT SPECIALIST II (12678JZ) P6; \$31,900-40,600 1-3-96 WCIT

INFO. SYSTEMS SPECIALIST I (12638JZ) P3; \$23,900-31,000 12-11-95 WCIT

MAJ. GIFT OFFICER III (11549JZ) (11550JZ) P7/P8; \$35,000-43,700/\$38,500-48,100 11-10-95 Ext. Affairs

PROGRAMMER ANALYST I/II (09354JZ) P4/P6; \$26,200-34,100/\$31,900-40,600 9-19-95 WCIT

PROGRAMMER ANALYST II (09387JZ) P6; \$31,900-40,600 9-28-95 Statistics

PROGRAMMER ANALYST I/II (10528JZ) P6/P7; \$31,900-40,600/\$35,000-43,700 11-8-95 WCIT

SYSTEMS PROGRAMMER I/II (0126JZ) P6/P8; \$31,900-40,600/\$38,500-48,100 1-15-96 WCIT

TECH WRITER (09417JZ) (Final candidates may be asked to submit a writing sample) P6; \$31,900-40,600 10-4-95 External Affairs

TECH. WRITER/EDITOR (09419JZ) (Final candidates may be asked to submit writing sample) P8; \$38,500-48,100 10-4-95 Deputy Dean

ADMIN. ASS'T. II (12630JZ) G10; \$18,700-23,300 12-5-95 Finance

OPERATOR, DUPLICATING MACHINE IV (10529JZ) (No vacation will be approved during Aug., Sept., Dec. and Jan.) (Overtime is a requirement of this position) (Work schedule: 5 p.m.-1 a.m.) G10; \$18,700-23,300 11-3-95 Wharton Repro.

LIMITED SERVICE (AUDIO VISUAL TECH I/II) (07105JZ) G10/G11; \$18,083-22,532/\$18,945-24,085 12-8-95 Classroom Support Services

RECEPTIONIST III (40 HRS) (12679JZ) G8; \$17,943-22,400 1-3-96 Development Services

SECRETARY IV (0153JZ) G9; \$17,100-21,400 1-23-96 Statistics

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Update

FEBRUARY AT PENN

EXHIBITS

Now: *Visions and Paradox: An Exhibition of the Work of Robert Le Ricolais*; Meyerson Hall. Through February 12.

12 *The CUT: Senior Undergraduate Exhibition*; Meyerson Hall. Through February 23.

SPECIAL EVENTS

Bazaar Shop of International House Winter Sale; 2-for-1 sale on selected jewelry, silk scarves, cards, note cubes, soaps, bookmarks; 50% off games and creativity kits, activity books, slipper socks, tapes and cassettes. *Through February 29.*

8 *Dining Out for Life*; have lunch or dinner at a participating restaurant, and a portion of the receipts will be donated to local AIDS-work efforts; call Action AIDS at 981-0088 for more information (Action AIDS of Philadelphia).

14 *Valentine Buffet Dinner*; 5:30-8 p.m., Faculty Club; \$14 exclusive of service charge. Reservations: 898-4618.

TALKS

6 *The Future of HIV/AIDS Activism*; 7 p.m.; Rm. B-27, GSE (Student Health).

7 *The Northridge Earthquake: A Natural Experiment in Market Structure*; Sean Ennis, UC/Berkeley; 12-1:30 p.m., Boardroom, Colonial Penn Center (Health Care Systems).

Teratoma-derived Cell Lines: Model System for the Study of Adipose Differentiation of Tumorigenicity; Ginette Serrero, University of Maryland; noon; Griesse Auditorium, Dulles Bldg. (Center for Research on Reproductive and Women's Health).

The Islamic Movement in Algeria; Francois Burgat, Institut de Recherches et d'Etudes sur le Monde Arabe et Musulman; 5:15 p.m.; West Lounge, Williams Hall (Middle East Center; French Institute for Culture and Technology).

8 *The Role of Community Based Longitudinal Studies in Evaluating Treatment Effects: Benign Prostatic Hypertrophy*; Harry Guess, Merck Sharp & Dohme; 9-10 a.m. 701 Blockley (UPMC).

Globalization of the Welfare State; Geoffrey Garrett, Management/Penn; 12-1:15 p.m., 2034 SH-DH. (Wharton Public Policy Series)

The Artistry of Jan Vermeer: Creating the Exhibition; Arthur K. Wheelock, National Gal-

lery of Art; 5:15 p.m.; Rm. B2, Meyerson Hall (History of Art).

9 *La Música Como Insignia Del Poder: Incas, Señores y Dioses. Perú, 1532-1630*; Juan Carlos Estenssoro Fuchs, École des Hautes Études en Sciences Sociales; 3 p.m.; Smith-Penniman Room, Houston Hall; lecture in Spanish (Latin American Cultures Program; Music).

12 *Troponin T Functions: From Lowly Twitching Worms to High Flying Birds*; Elizabeth A. Bucher, cell and developmental biology; 2 p.m.; Physiology Conference Room, Richards Bldg. (Pennsylvania Muscle Institute).

Minority Status and Schooling in Urban Context; John U. Ogbu, University of California, Berkeley; 3-4:30 p.m., D44, GSE (Search Committee for the Constance Clayton Chair in Education). *Series continues on February 19.*

Deadlines: The deadline for the March at Penn calendar is Monday, February 12. The deadline for the weekly update is on Mondays, the week before publication.

Survey Reminder: February 9

The restaurant/retail survey being conducted by University City Associates is accessible electronically at www.upenn.edu/real_estate/survey/ or call 898-7311 for a paper copy. Respondents who complete the survey by February 9 will be eligible for gift certificate prizes to be drawn on Valentine's Day.

The University of Pennsylvania Police Department Community Crime Report

About the Crime Report: Below are all Crimes Against Persons and Crimes Against Society listed in the campus report for **January 22, 1996 through January 28, 1996**. Also reported were **Crimes Against Property, including 42 thefts (including 3 burglaries, 3 thefts of autos, 12 thefts from autos, 1 of bicycles and parts); 5 incidents of criminal mischief and vandalism; 1 incident of trespassing and loitering; 1 incident of forgery and fraud.** Full crime reports are in this issue of *Almanac* on the Web (<http://www.upenn.edu/almanac/v42/n18/crimes.html>).—Ed.

This summary is prepared by the Division of Public Safety and includes all criminal incidents reported and made known to the University Police department between the dates of **January 22, 1996 and January 28, 1996**. The University Police actively patrol from Market Street to Baltimore Avenue and from the Schuylkill River to 43rd Street in conjunction with the Philadelphia Police. In this effort to provide you with a thorough and accurate report on public safety concerns, we hope that your increased awareness will lessen the opportunity for crime. For any concerns or suggestions regarding this report, please call the Division of Public Safety at 898-4482.

Crimes Against Persons

34th to 38th/Market to Civic Center: Robberies (& attempts)—2;

Threats & harassment—4

01/22/96	10:46 AM	Science Center	Harassing messages left on voice mail
01/22/96	7:42 PM	100 Blk. 38th	Wallet taken by unknown suspect
01/24/96	10:04 AM	Annenberg Sch.	Complainant reports being followed by male
01/24/96	1:47 PM	College Hall	Complainant reports being harassed
01/26/96	5:53 PM	3429 Walnut St.	Unk. males took cash/gun/clothing/no injuries
01/27/96	1:47 AM	Nichols House	Guard receiving harassing phone calls

38th to 41st/Market to Baltimore: Robberies (& attempts)—4; Threats & harassment—5

01/22/96	8:02 PM	208 S. 40th St.	Males took cash at gunpoint
01/23/96	4:08 AM	4035 Walnut St.	Male attempted to rob complainants
01/23/96	12:59 PM	High Rise North	Complainant harassed by ex-boyfriend
01/24/96	3:56 PM	3927 Walnut St.	Complainant reports being harassed
01/25/96	9:25 PM	41 St. & Pine	Complainant robbed by unknown male w/gun
01/25/96	10:29 PM	400 S. 40th St.	Actors took complainant's wallet and fled
01/26/96	4:16 PM	Harrison House	Complainant receiving harassing calls
01/26/96	8:35 PM	4048 Spruce	Compl. receiving harassing calls from juvenile
01/27/96	2:54 PM	1925 House	Unwanted/threatening calls received

41st to 43rd/Market to Baltimore: Robberies (& attempts)—1; Simple assaults—1

01/22/96	11:00 PM	300 Blk. 42nd	Complainants' wallets taken by unk. suspects
01/26/96	7:18 PM	4117 Pine	Domestic dispute

Outside 30th to 43rd/Market to Baltimore: Robberies (& attempts)—1;

Threats & harassment—1

01/26/96	3:47 PM	4400 Spruce St.	Harassing phone calls received
01/27/96	11:57 PM	200 Blk. S. 44th	Complainants robbed by unknown suspect

Crimes Against Society

34th to 38th/Market to Civic Center: Weapons offenses—1

01/27/96	10:57 PM	University Ave.	Unauthorized male with gun/arrest
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38th to 41st/Market to Baltimore: Disorderly conduct—1

01/24/96	4:52 PM	40th & Walnut	Male cited for disorderly conduct
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Almanac

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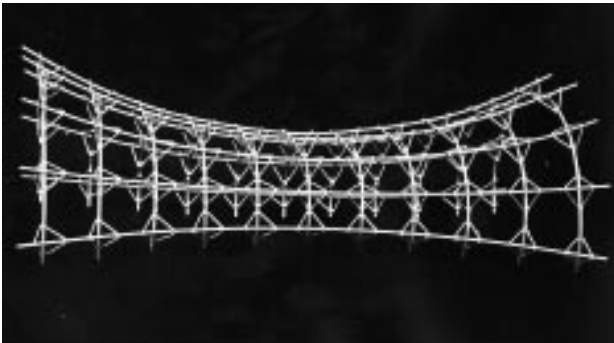
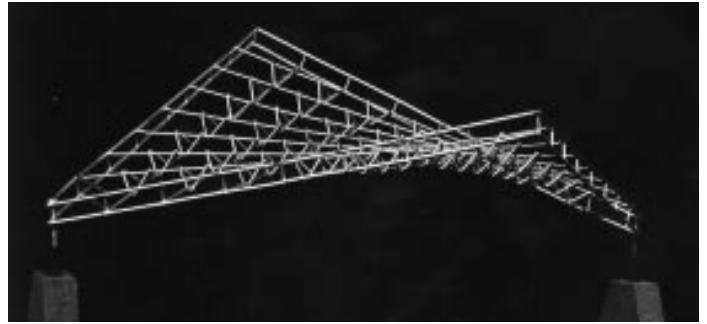
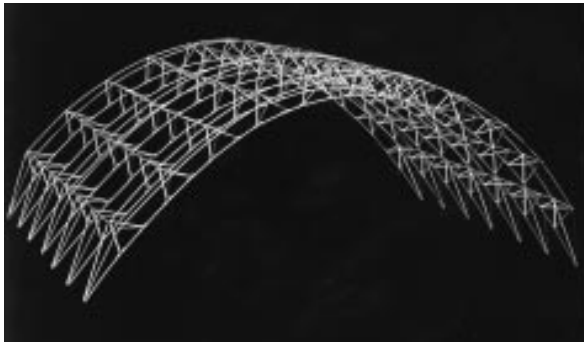
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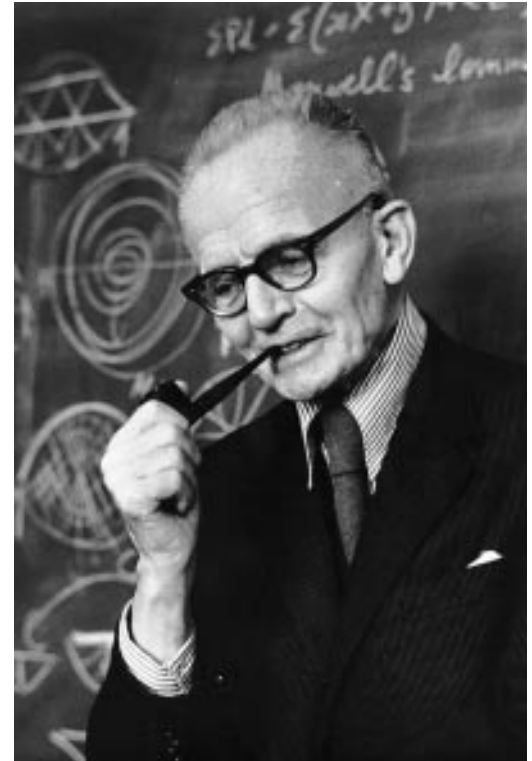
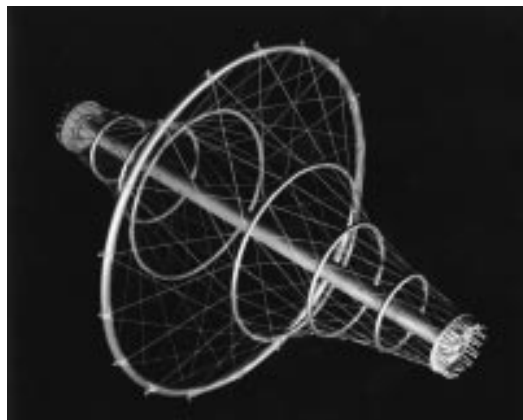
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Over 200 structural models were built and tested in le Ricolais' workshop during his 20 years at Penn. Some of the most daring and beautiful are on display now through the support of the National Endowment for the Arts, the Department of Architecture and the Graduate School of Fine Arts.

Visions and Paradox

The work of Robert le Ricolais is being shown here before it goes abroad.



Robert le Ricolais, 1894-1977

Since the death of Robert le Ricolais, a large collection of beautiful models that he and his students made in his workshops at Penn over a period of 20 years has lain in various storerooms, in the care of his onetime student, Professor Peter McCleary.

This year, with the help of a new generation of architecture students, Professor McCleary brought the models out into the light again, for an exhibition that will be here only through next week, then moves on to London, Lucerne and Madrid (and tentatively also to Barcelona and Zurich) before it ends up in a slightly different form at the Pompidou in Paris.

Visually, the work could stand alone as an exhibition of sculpture: it fills the gallery with lyric forms, elegantly crafted in steel, wood and leather, suspended from the ceiling or mounted on pedestals. But from nearby drawings and photographs emerge the layers of thought and teaching that lie behind the development of the designs. Their roots are in nature and in science—in a seashell, a soap bubble or le Ricolais' fantasy of "going inside a rope" to find a new way to realize his cen-

tral vision of *zero weight, infinite span*.

Pulling it all together is a catalog, modestly produced but rich in the language of a teacher who could also create the spare and elegant phrases that would convey his concepts to others. An apparently simple sentence, *The art of structure is where to put the holes*, is his point of departure for an exposition on strength without weight in a tube shape that might create a new kind of subway tunnel.

Le Ricolais was born in 1894 at La Roche sur Yon. His university studies in math and physics were curtailed by World War I—in which he was wounded and decorated—but he was to go on in teaching and research anyway. As a practicing hydraulics engineer (as well as a painter and poet), in 1935 he introduced the concept of corrugated stress skins to the building industry and was awarded the Medal of the French Society of Civil Engineers. Then in 1940 his work on three-dimensional network systems introduced many architects to the concept of "space frames." After years of research and many patents—and the 1962 Grand Prix of the Cercle d'Études Architecturales—he was well established as the

"father" of space structures." In 1951, at 57, he came to America to conduct "experiments in structure" workshops at Illinois-Urbana, North Carolina, Harvard, Penn and Michigan.

Settling at Penn in 1954, he led generations of students to his perception that "to discover the nature of things, the secret is to be curious," drawing on mathematics and physics, engineering and zoology in search of new visions for structures of the future—visions not limited to the individual structures to be built on or above or below the earth, but to the ways they might change the nature of cities and the circulation of human beings in them.

In 1974*, le Ricolais succeeded Louis Kahn as the Paul Philippe Cret Professor at GSFA, holding the prestigious chair until his death in 1977. His once-peripatetic models and papers now have a permanent home in the University's Architectural Archives.—K.C.G.

Visions and Paradox is at Meyerson Hall, 34th and Walnut Sts., through February 16. Hours are 10 a.m. to 5 p.m. weekdays except Wednesdays (9 a.m. to 8 p.m.). Saturday hours are 10 a.m. to 4 p.m., and the gallery is closed Sunday.

*Note: This date was incorrectly identified as 1954 in the print version