



Chronicles

Newsletter of the UCSD Emeriti Association

Volume III, No. 1

October 2003

President's Message

—by Murray Rosenblatt



I write this initial communication to the Emeriti at a time of crisis for California: first, an extremely large deficit for the state, at times estimated at 38 billion dollars; second, an attempted recall of the governor with all its political overtones. Of course, we all hope the possible disruptive effects of these marks of travail for the state and its citizens will be much milder than currently anticipated. The University of California is affected to a great degree by the deficit. The 2003-04 state budget will lead to a 30% increase in fees for resident undergraduate students, no salary increases for faculty and staff, and a one-year delay in opening UC Merced. The budget effects a \$410 million cut in state funding for UC programs. Since 2001-02, UC's budget funded by the state has decreased by 13.6%. A positive aspect for Emeriti is that retirement stipends should not be affected by this impasse, since the source of funds is different and is expected to be quite secure.

There is currently flux at the University of California, San Diego with the choice of Chancellor **Robert Dynes** of UCSD as the president of the Uni-

versity of California system. An insert in the June 20, 2003 issue of *Science* under the lead "Skating on Bumpy Ice" discusses some of the problems President Dynes faces — in particular the sizeable state budget cuts and questions about the University's management of the Los Alamos National Laboratory. They note his "learned agility and toughness as a junior hockey player in Canada" and quote astrophysicist **Vogt** as calling him easygoing and funny, but "inside he is as tough as steel." Until a new Chancellor of UCSD is selected, Vice-Chancellor **Marsha Chandler** will serve as Acting Chancellor. We welcome retiring President **Richard Atkinson** of UC back to La Jolla and UCSD. Presidents Atkinson and Dynes are the first and second UCSD Chancellors to advance to President of the UC system.

Inflation is a natural concern for Emeriti. Unfortunately the University retirement system doesn't fully match increases in a consumer price index (CPI). Generally the system matches the increase in CPI up to 2%, and an additional 75% of the CPI increase in excess of 4%, up to a maximum cost-of-living adjustment (COLA) of 6%. There may also be a contribution from an "inflation bank" and a "COLA bank." The inflation bank matches the cumulative increase in CPI that the member has not had matched (adjusted for inflation) and can be used to in-

Mark Your Calendar!

UCSD Emeriti Association Meetings

Tuesday, October 21

4:00-5:00 PM

Price Center

Gallery A

Sanford Lakoff

"Current Political Comments"

Thursday, November 6

4:00-5:00 PM

Price Center

Santa Barbara/Los Angeles Room

Freeman Gilbert

"New Insights in Geophysics"

NOTA BENE!

This issue of *Chronicles* is being sent to all eligible Emeriti with addresses in our data base. Subsequent issues will be sent only to members of the UCSD Emeriti Association. Dues are \$25/year or \$200 for life membership. See page 8.

crease the COLA in years with inflation of less than 2%. In years in which inflation is less than 2%, the difference between 2% and 4% in the CPI increase is put in the COLA bank. The COLA bank can be used to increase the COLA in future years when inflation exceeds 2%.

The long-term evolution of Medicare is open due to the pressure of the national administration to allow a heavier dependence on private enterprise. This may eventually have an effect on UC's arrangement for medical facilities for faculty, staff, and Emeriti. However, we can probably assume that the usual choice of options (in November) will not differ too much from current arrangements except for the usual effect of inflation.

Sandy Lakoff has kindly offered

to hold forth at our first meeting of the UCSD Emeriti Association on October 21 to make some "Current Political Comments." He will have had time to reflect on the effect of the California election on October 7, though I know much of his interest is on the situation in Iraq. We are indebted to Sandy, since he has just completed his term as president of the Emeriti association. **Freeman Gilbert** will talk at our second Emeriti Association meeting on November 6 on "New Insight in Geophysics." Freeman is very well known for his researches on geophysics and earthquakes, some of them carried out jointly with **George Backus**, Emeriti president before Sandy Lakoff. I hope to see you all at the meetings. Suggestions for speakers at later meetings are welcomed.

Editor's Remarks

*Since this is the first issue of **Chronicles** for the academic year 2003-2004, I thought it was time to introduce a new theme that would be appropriate for our Emeriti readers.*

*It is a common observation that extraordinary changes have taken place in the past half century, roughly the time corresponding to the scholarly lifetime of our UCSD emeriti. It is my intention to run a new series of articles in **Chronicles** in which we emeriti give our personal accounts of the major changes in our fields during our lives.*

The article on the following page is my own attempt to show what I have in mind, followed by another by a respected colleague.

If you would like to contribute your own story (1000 words or so), please send it to me:

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UCSD Emeriti Association Executive Committee

At the business meeting of June 2002, the following were nominated and voted in as members of the Executive Committee of the UCSD Emeriti Association.

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I'm hot on the trail of the culprit responsible for the extraordinary opaqueness of the "Explanation of Benefits" statements that some of us get from Blue Cross. At the moment I can tell you that Blue Cross blames the University, the University Benefits Office blames Blue Cross, the University Health Care Facilitator in the Office of the President blames the nameless committees that meet to discuss the problems between the University and Blue Cross, and the bottom line is that we cannot be told what doctor claims to have performed what service for us on the date specified, nor can we have a clear statement (à la Medicare's clear statements) of whether we still owe somebody some money. —ed.

How My Field has Changed Since I Began

Changes in Linguistics

—by Leonard Newmark

When I started graduate work in 1950, linguistics was still a young field. Our professional association, the Linguistic Society of America, had been founded only 26 years earlier with a few dozen members. When I attended my first annual meeting, in December 1950, we 65 attendees all sat together through several sessions, listening to most of the papers, whether the topic was runic inscriptions on a Scandinavian horn, the phonemes of Tubatalabal, Hittite declensions, or the reality of archiphonemes in Russian. There was a sense that we were all in a single field, although some people were more interested in historical, diachronic topics and some more in descriptive, synchronic ones. To prepare for my doctoral qualification examination, I was able to read all the back issues of just three journals, which comprised practically the entire corpus cited by the hot articles of the time and by my professors.

In America, most of us shared a common interest in what we thought of as linguistic theory, and most of us shared a rejection of the subjective mentalism of earlier centuries that still marred language studies by most European philologists. We appreciated the early and middle 19th century establishment of historical language family relationships, and especially the discovery of the regularity of language change and the structural regularities that underlie that change. But coming out of the anthropological traditions that **Franz Boas** had created in America and the development of scientific phonetics in France and England, we thought that we could introduce a revolutionary kind of rigor into the study of language. Under the strong influence

of **Leonard Bloomfield** and his followers, the rigor we boasted was based on a kind of behaviorist trust in inductive procedures and a distrust of mentalistic categories. And we began to call ourselves “structuralists,” under the influence of **Ferdinand de Saussure**, **Count N.S. Trubetsky**, and **Roman Jakobson**.

We made fun of the attempts by 19th century prescriptive grammarians to dictate language use on the basis of principles derived from study of Latin, and laughed at attempts to discover universals in languages or the origin of language. With a single methodological principle that provided a basis for discovering quickly the significant elements and their arrangements in any language, we echoed others’ pronouncements that linguistics had become the queen of the social sciences, and we were even seemed successful in exporting our analytic techniques to the analysis of other social systems. The principle, sometimes called the commutation test, permitted the linguistic scientist (so-called in government circles to distinguish us from polyglots) to identify the significant elements and structures in a language, simply by having a native speaker of the language indicate whether two utterances were the same or different. Analytic comments (e.g., “that’s not grammatical,” “it’s an adjective”) offered by the native speaker were totally discounted as mentalistic fictions, subject to contamination by folk or schoolmarm fictions.

The two main tasks that interested “true” linguists (distinguished from mere polyglots, philologists, general semanticists, language philosophers,



and Bible translators) of the day were 1) theoretical: elaborating the methodology used to describe languages with scientific rigor (epitomized in **Zellig Harris’** 1951 *Methods in Structural Linguistics*), and

clarifying the ontological status of the units posited by that methodology; and 2) practical: describing the world’s various spoken languages before they disappeared — at my university, especially the imperiled North American Indian languages.

To describe a language, the rigorous linguist had to determine its significant sound units (phonemes), including the intonational ones (stress, pitch, and juncture), and then its significant grammatical units (morphemes), in that order. Then and only then could one attack the fuzzy subject of syntax (the arrangements of morphemes) and the dreaded and mostly neglected areas of meaning and vocabulary. It was typical for a linguist to write a grammar of a hitherto undescribed language in a few summers of field work. I was told by a dissertation advisor that nothing less than a whole grammar of a language would earn me a Ph.D.; he cited Franz Boas, the great father of anthropological linguistics and the teacher of his teacher, **Edward Sapir**, as the promulgator of that doctrine. I did write a grammar that satisfied him, by leaving out all the fuzzy and hard parts, of course.

In 1950 there were still less than a handful of linguistics departments in the country; the some 800 members of the Linguistic Society of America were variously employed in language departments and departments of anthro-

pology or English. A major employer was the Foreign Service Institute in Washington, D.C., because during World War II linguists had gained the reputation of being miracle workers in constructing and conducting language-teaching programs in exotic languages. I was a beneficiary of that reputation, first as a graduate student with rare financial support (for developing an Albanian language program for the Air Force at Indiana University; later for programs in Punjabi for the Peace Corps) and later, of course, for programs in most of the languages taught at UCSD. Students rarely entered graduate study in linguistics with any prior work in the field, because few colleges offered undergraduate linguistics courses.

No-no's for linguists in my graduate student days were appeals to mentalism and the use of negative evidence. But over the ensuing half century, **Noam Chomsky**, a student of both Zellig Harris and Roman Jakobson, created and led the next revolution in

linguistics, by using both mentalistic constructs and negative evidence (judgments of "ungrammaticalness") to such great effect that the field was dramatically transformed. Instead of refining descriptive methods that induced successive layers of generalization from physical data in a given corpus, Chomsky totally rejected such inductive discovery methods. Instead, he proposed to build a theory that might eventually be tested deductively against the subjective judgments of sensitive users of the language. That theory has now gone through at least three major revisions, but it survives and enjoys enormous prestige with its many adherents.

Many other linguists over that half century enjoyed the liberation that Chomsky brought from the phobia in regard to mentalism and philia in regard to operationalism, and some developed their own non-Chomskyan schemes. The field has expanded in abundance: the Linguistic Society of America now has over 5400 members, with well over 1000 attending the an-

nual meetings, sitting through simultaneously running sessions devoted to narrow specialist interests. Most major universities and a number of minor ones now have full-fledged linguistics departments, and linguists find vocations, rather than avocations as linguists. And the number of journals in various subfields would now make ludicrous any attempt to read "all" the important articles in linguistics, as I was able to do as a graduate student. No respectable scholar now could call himself a "general linguist" or even "linguistic theorist," as I once thought of myself. The jobs advertised today are for specialists in syntax or phonology or morphology or computational linguistics or sociolinguistics, developmental linguistics, neurolinguistics, cognitive linguistics, language pedagogy, and on and on.

And I assure you that no respectable graduate student today would dare to undertake writing a whole grammar of a language and no professor would suggest it as even a possibility.

This is the first of two articles by Ken Bowles, reflecting on the changes he experienced in his field. This one focuses on computers and software. The second will fill in some of the gaps in his personal history.

Computers: 50+ Years Coping with Science vs. Technology

— by Ken Bowles

I started as a student under **Henry Booker** in 1951, with a goal to understand the Aurora Borealis using radio and radar as tools of *remote probing*. I quickly found myself heavily involved with the primitive tools then available for performing the massive computations basic to *time-series* analysis. I've spent more of my professional time working with computers than in any other activity ever since then. So your editor thought it might be relevant to summarize my experiences as part of a

series on the changes seen by UCSD emeriti during their careers.

To understand the title of this note in the context of the engineering programs at UCSD in recent years, one needs to understand that these radar studies were integral within the Electrical Engineering School at Cornell. The goal of Henry's research group was to understand the natural environment (ranging from tropospheric heights out to astronomical distances) by making innovative uses of the best

currently available knowledge of electrical devices as tools. The work was in EE rather than Physics because radio wave propagation was by then considered "classical" physics. But we soon learned that our experimental methods were in many ways identical to the methods used in experimental physics, and we often shared "engineering" knowledge with folks in that field. Very often we had to invent new tools using the best and most current knowledge of electrical science, while the

tools available commercially were five years or more out of date.

The radio and radar signals used for remote probing of the atmosphere (whether of the earth, sun, or interstellar medium) fluctuate over time in ways that can reveal amazingly detailed information about the physical and chemical characteristics of the atmospheric gaseous medium. But to get that information requires *signal processing* of long series of data points sampled at brief time intervals. To get reasonable experimental accuracy, one often needs a suite of multiple simultaneously sampled time-series data, with at least a million data points in each time-series. The analysis typically involves algorithms that multiply together the values of pairs of data points, then aggregate the sums of those multiples — often just to achieve one final data value in a profile consisting of hundreds or thousands of such sums. Today, one can often perform the needed computations on the same personal computers sold to consumers, or with one of those computers assisted with a special purpose *signal-processor* device. In 1951, we had to do those computations on an IBM “Multiplying Punch”, which ingested punch cards containing the original data points at the rate of 2 or 3 per second, and produced the intermediate multiply-add values. It took several passes of perhaps 2000 of these cards through the machine to achieve one very rough spectrum curve describing our auroral



IBM
650

radar data. The data got onto the cards via the manual keypunching of data points scaled off a pen-and-ink curve plotter instrument (much like our friends in seismology were using at UCSD several years later).

In 1955, shortly after I went to work for the NBS Central Radio Propa-

gation Labs (CRPL) in Boulder, Colorado, one of the first commercially available mainframe computers arrived — an IBM 650. Though we had been learning the newfangled details of designing electronics with transistors at Cornell EE by that time, the 650 was based on vacuum tubes. The memory was a rotating drum. Programs were written using the primitive instructions of the machine (think of one button-press on a simple hand-held calculator as the equivalent of several of those instructions in sequence). For efficiency, one had to calculate how far the drum would rotate from one instruction to the next so as to get each instruction properly placed. For time-series work, the 650 was slower than the old multiplying punch — though the machine was useful for later stages in performing more complex analysis after the time-series data had been reduced. Those frustrated with occasional crashes of their desktop computer running Microsoft Windows, may empathize to know that the 650 crashed because of failed vacuum tubes every hour or two.



Packard
Bell 250

Since this is a story about experiences with computers, I’ll now have to fast-forward several times. By 1962 we had built a huge radar observatory in the Jicamarca valley near Lima, Peru. Our general-purpose computer was a Packard Bell 250, one of the earliest commercial “minicomputers.” The 250 had magnetostrictive delay line memory, which logically was programmed in the same manner as the old IBM 650. To control the radar, and do the initial layer of time-series analysis, we had to build our own much faster microprogrammed computer. This machine was programmed by plugging wires into a plugboard that had been salvaged from the 650. Fortunately both machines used transistors, rather than vacuum tubes, so crashes

only occurred once or twice a week. We were by then able to squeeze a lot more information out of those fluctuating time-series, and could concentrate more of our time on identifying atmospheric characteristics such as ion density, temperature, and composition — and less on keeping the electronics running.



Burroughs
5500

At about the same time, a revolution in the programming of computers was occurring. Fortran for science, and COBOL for business, were coming into common use in the U.S. A group dominated by European universities proposed a more orderly programming language called ALGOL (Algorithmic Language). I’ll return to this topic in connection with the Pascal and Ada programming languages, after dealing briefly with the ARPAnet and Internet.

In 1969, the Defense Department’s ARPA had sponsored the first two of three computer-related projects that became very significant to the rest of my career. One was **Larry Roberts’** work with the fledgling ARPAnet (now called the InterNet) as a new, more robust, approach to communicating digital information among computers. The other was **Dan Slotnik’s** project with the massively parallel Illiac IV computer at the University of Illinois at Urbana. It happened that Slotnik and colleagues were using a Burroughs 5500 computer for the compilers (programming language translators) needed to create programs for the Illiac. From a computer science point of view, the B5500 was the most advanced machine of its day. A newer B6500 was needed, but funds were insufficient to buy one for Slotnik’s project. We at UCSD started briefly with a B5500, as part of buying a B6500 to replace the old 3600 central computer. We too had

[Continued on p.7]

This past spring Emerita **Mary Corrigan** conducted an interview for **Chronicles** with then-Vice-now-Acting Chancellor **Marsha Chandler**. Over the next few issues, we will see our Acting Chancellor's views on her personal history, some policy questions, and future prospects for UCSD. The first article deals with her personal history.

Acting Chancellor Marsha Chandler

—Interview by Mary Corrigan

Personal History

Question: What's the difference between UCSD and the University of Toronto?

Answer: Not much difference, because both places are really intensive research universities and the focus on excellence was very much the same. The push is to hire the very best people and to ensure that they flourish once they are here. At many of the premier universities there is really a striking similarity. Toronto is larger and the big difference is perhaps that they have more of a range of big professional schools. I was cross-appointed in the Law School. My background is in social economy. I always taught part of the time in the Law School, so I miss having that and miss the range of professional schools that really adds to a university. The School of Management will be a very positive addition to our campus. Obviously our Medical School, Engineering, and IR/PS are very positive things here. So the number of professional schools was one of the biggest differences. To name a few more of those: schools of social work, education, forestry, library sciences ... you name it. I was Dean of Arts and Science.

Q: I have heard that you had a very good reputation there. Were you teaching there also? And how long were you there?

A: I was there for 20 years. I started as an assistant professor and then became chair of the Political Science Department. Subsequently, I served as Dean of Arts and Sciences from 1990 -1997.

Q: What qualities do you think are particularly important for an administrator?

A: Well first of all, you have to enjoy the work, otherwise it would really wear you down. You have to be a parallel processor and you can't be too concerned that multiple things are going on or that there are too many balls in the air. Also, you have to be interested in what's happening to other people.

Q: Do you think that your gender helps in your decision-making process?

A: Probably not. When I think of some of the people that I consider the best deans or the best chairs, I don't think gender was an issue. At Toronto there were 30 department chairs that reported to me, and about a quarter of them were women.

Q: Isn't that an extremely high ratio?

A: (Laughter) It wasn't that way when I started.

Q: How many were there then?

A: Two. When I was a chair, there were only two (more mutual laughter). It did change over time. In becoming a dean or something broader than a department chair you really have to be interested in fields outside your own.

Q: Isn't it difficult sometimes to maintain a balance between the personal qualities of an individual vs. the pressing academic standards?

A: It really is hardest for a department chair, that's where the rubber hits the road. As chair, these are your colleagues, these are people who are your friends, etc. You are the one as department chair who must make the tough



decisions. One of the virtues of the UC system is that there are multiple layers. There are a number of levels here.

At the University of Toronto, it was much flatter; for instance, tenure decisions were actually made in the department with a representative from the dean and a representative from the graduate dean. So there were two outside people in the decision-making process, and if the candidate received two no's, he or she wouldn't get tenure. Whereas at UCSD, the department makes a recommendation, the dean makes a recommendation, sometimes there is an ad hoc committee, the file goes to CAP, and then those recommendations come to me.

Q: It appears that internal department politics play less of a part here?

A: I believe so. Of course it takes much longer because of the additional input but at the same time it does guarantee a greater equity.

Q: Is the University of Toronto unionized?

A: Not the faculty. I know that the staff became unionized my last year there. I didn't have much experience with it.

Q: What are some additional qualities that might be helpful for a senior administrator?

A: Having an analytical mind, problem-solving ability, and one has to enjoy communicating.

Q: What do you think is the most time-consuming aspect of your job?

A: I am constantly meeting with people. That's what I do. There isn't an hour of the day that I sit in here alone.

Q: That must be quite wearing. What do you do to reduce stress from that?

A: Well, I exercise. And you have to like the work or else you wouldn't do it. Most often it's a problem-solving situation. So it is absorbing. You discuss a problem, try to find a solution, and hope to make things better. That's really important, because if it were just going day after day without progress or improvement, that would really wear one down.

Q: Do you have young children?

A: I have a 26-year-old daughter.

Q: Were you in an administrative position when she was young?

A: I was chair of my department. She was about 10. My husband is also an academic. **Alice** (my daughter) used to like to walk around with a little briefcase.

FFFFFFFFFFFFFFFFFFFFFFFF

[*Bowles from p. 5*]

budget problems. ARPA proposed that we should provide the computer services needed by Slotnik's project via remote connection through the ARPAnet. For a period of 3 or 4 years, the U. of I. project became the single biggest dollar-paying user of the UCSD computer center. During that period we learned the essential design techniques that eventually became the UCSD Pascal project. In the course of doing so, we exerted a lot of software engineering influence on Burroughs that the company recognized as helping them, and lots of other university users, to improve the operating efficiency of the machine. We also learned the amazing benefits of E-mail (before "Spam" was invented!).

Eventually, the UC-wide politics of computing got me fired rather suddenly in 1974 from my position as (by

then "academic") computer center director at UCSD, and I took a sabbatical leave in residence. I turned to the goal of applying the best of currently available computers to improved teaching of large introductory programming courses. By then computer science was becoming recognized as a legitimate research discipline at the better universities worldwide, although people's models of what that meant were, and are still, amazingly diverse. One branch of the diversity dealt with higher level programming languages. **Niklaus Wirth**, at ETH in Zurich, had published a book describing his new language Pascal, which owed its beginnings to the ALGOL project. Wirth's student **Urs Ammann** had written a *virtual machine* program, in Pascal itself, with instructions on how to implement Pascal on almost any computer of the day. Several hundred university computer science departments had done so. At about the same time, the first desktop microcomputer, the MITS ALTAIR, had been introduced as a commercial product by a small group in Albuquerque. At UCSD we implemented the Pascal virtual machine first on a classroom full of Digital Equipment PDP-11's. We then went on to implement the same software on roughly ten of the rapidly emerging commercial microprocessor models coming from various vendors. We used the Pascal language to write our own operating system, interactive editor, file manager, and other essential parts. We proved that the same complex software, without modification above the virtual machine, could be run on almost any computer the industry cared to produce.



Digital
Equipment
PDP-11

Wirth's
design of the
Pascal lan-
guage was
motivated by

the goal of finding ways to reduce the tendencies of humans to introduce logical errors into the programs they wrote. During at least the 30 years starting around 1970, contributions to the worldwide research literature regarding solutions to that problem became voluminous. One of the principal projects was sponsored by (D)ARPA, and led to design of the Ada programming language. Ada really started with Pascal, then added facilities to catch program errors as early as possible. The intent was to develop a programming language which could be used as the basis for "mission critical" software, such as control systems for aircraft, air traffic, and spacecraft, nuclear reactors, medical instrument monitoring, etc. Associated with the goal to make the language less error-prone was the goal to standardize strictly so that most programmers intending to work with implementations of the same name would actually get identical results if they wrote the same program in that language. Our work with UCSD Pascal had shown one way to get that result in principle. But the commercial approach used with devastating effect by **Bill Gates** was to watch the start-up market for products that could sell, then develop similar but different products to sell without paying royalties. Those different products rejected the confines of the language standards, and catered to programmer demands for products that gave them the flexibility to do anything the basic mechanisms of a computer would allow — even if some of those techniques had repeatedly been proven to be error-prone. It's pretty clear that today's problems with the frequent crashing of Windows, and with the security holes encouraging viruses, have their origins in that commercial technology approach used by Microsoft so often. Lately they have been trying to improve on that situation, but the legacy of tens of millions of program code lines already in their products presents at best a daunting barrier to real improvement.

