Marcus Discusses Nobel Prize, Part II

Kevin Dun & Anne Rudzik

(This is part two of the interview with Dr. Marcus. Part one was presented last week.)

D: When you were looking at this formula and all of your work; did you ever anticipate how widely used it would be?

Marcus: No, definitely not. I regarded it as a way of handling a problem in what seemed to be a relatively small field at the time, the in-field of isotopic exchange reactions, and the field of some simple electron transfer reactions of a somewhat different kind called cross reactions, namely electron transfer reactions between two different redox systems. In contrast, isotopic exchange reactions occur between the utilized and oxidized forms of the same redox system.

The thing that has impressed me so much about the whole electron transfer field is how it has grown in so many directions. For example, in electrochemistry, right after this 1956 work, I wrote a paper that I never submitted on electron transfer at electrodes. It became a very widely quoted technical report, in 1957, at the Office of Naval Research Technical report. Later I published the equations of it in 1959. For a background on electron transfers at electrodes, an area quite new to me, I benefited from a wonderful article by Roger Pearson which laid out all of the equilibrium theory for electrodes in contact with solutions. I was able to adapt it and treat nonequilibrium fluctuations in the vicinity of the electrode, fluctuations that permitted an electron to go from a molecule in solution or an ion in solution to the electrode, and vice versa. But then I extended this work to many different areas, the biological, for example, or to cross reactions of a type that had nothing to do with electron transfer. I have a slide that I often show at talks which shows many of these extensions. There among the reactions are those occurring at different types of electrodes: modified electrodes or semiconductor electrodes. Again, some of that work is being done by Fred Aman and Nate Lewis here for example. Again on the electron transfer in proteins that Harry Gray is doing has stimulated me to look into long range electron transfer in proteins. Then there’s been electron transfer between liquids, between reactants across an interface of two immiscible liquids. The scope, at present, seems to be unlimited. There’s a process that is being used to study in detail the behavior and structure of molecules adsorbed on surfaces, scanning tunneling microscopy, for which the Nobel Prize in physics was given a couple of years ago. We expect that some of the ideas, not the fluctuations aspect but the electronic interaction aspect that’s new for us and that we’ve applied to proteins and other things, can be extended to treat the STM images. We’re very much more new in that field, and in fact in the field of the electronic aspects of electron transfers and semiconductors, itself, a new study that people are making experimentally is based on putting ordered metal and having electron transfer across that. The electronic effects are very important there, so that whole electronic interaction aspect, which is very interesting, is something that

The Practical Bohemian

Chris Echols

Ed Metzger’s presentation on his upcoming one-man act Einstein: The Practical Bohemian took place Monday night, October 26, in Dabney Lounge. Sitting before a small audience, he related in his New York accent a lively and entertaining tale about how his show has developed.

The idea of doing a one man show occurred to him in 1976, when he thought about doing one of the Presidents. But this didn’t appeal to him, so he searched for other ideas. The idea of a solo on Einstein, a scientist, would surely be boring, he thought, but when he took the idea to his wife, she was enthusiastic. So they went to the library...

They eventually contacted Einstein’s son and met with him. His response: “Boy, do you have guts.” But Metzger emphasized his underlying motivation to continue: “He [Einstein] touched us in a certain way that I wanted to find out about.”

The first show opened in LA, where it received tremendously positive reviews. He then took the show to New York in March of 1979, where the Einstein family saw him perform. Metzger was later entertained at Einstein’s home, where he received only one complaint on his act: “Our cousin Albert...was a womanizer.” The audience was quite amused by this and other anecdotes collected by Metzger through his years of work.

As his show has grown more and more popular, he has been asked to perform at a considerable number of colleges and universities. In fact, Saturday’s performance will be his third here at Caltech.

My impression was that Metzger is a very talented and remarkable performer. His deep interest in his subject was clearly evident throughout his talk. His painstaking artful efforts to portray the human side of one of the most intriguing men in history was also obvious. His dedication is also outstanding; his years of research were evident as crazy anecdotes about Einstein crept into the story. Metzger, through conversations with Einstein’s closest friends and relatives, has learned the subtleties of a man we only know as a great thinker. His act should prove to be a delightful, entertaining insight into the most intriguing character of our times.

The show is scheduled for Saturday, November 7, at 8 p.m. in Beckman Auditorium.

ASCIT Committees

Korhan Gurbakan

It’s once again time for those committees. I have put signups for the Academic Policies, Grievance and Athletics committees outside the ASCIT Meeting Room (next to the DRL’s Office) in Winnett. These committees need one or two members each. Also, the Women’s Center needs one undergraduate on its Advisory Board and one on its Director Search Committee. There are also signups for these. You can signup for both positions. SIGN UP SOON!

World News

Crime & Incident Beat

State Propositions

Inside this week’s TECH

Letters 2
World News 3
Crime & Incident Beat 4
ASCIT Election Stuff 4
ASCIT Minutes 4
Y News 5
Fixin’ To Die 5
Comics 6
Bridge Without Sam 6
State Propositions 6
What Goes On 8

Pasadena, California

October 30, 1992
Forget the textbook. The economy, runaway federal deficit, abortion rights, and an increasing gap between the rich and poor are just a few examples of issues which may impact our lives in a personal way at some point in the future. Presidential candidates Clinton, Bush, and Perot offer us a spectrum of positions encompassing substantive differences on some issues (e.g., abortion) but very little in others (e.g., defense spending). To gays, lesbians, and bisexuals, however, Presidential candidates in this election present far greater differences on issues of personal importance than ever before. If we vote and elections, gays and lesbians have not voted as a bloc, since party lines were not so clearly drawn on the issue of gay rights. This is dramatically illustrated by the inability of gays and lesbians to decide between Danianne Feinstein and Pete Wilson in an endorsement for the California Senate. Two years ago, Governor Wilson made campaign promises to sign gay rights legislation and to support gay rights, while running in the Republican primary. Come election day, the "Lavender vote" will be unvilked!

The Anti-Gay and Lesbian Coalition (CLAGS) is watching this Presidential race with passionate hope. Come election day, we will join together to watch incoming returns; we expect to celebrate the dawn of a new era for the Gay, Lesbian, and Bisexual community. New supporters are welcome to come join us. For information, call 792-7292.

Sincerely,
David Koerner

Remember Barry Robert Krueger

To the Editor,

Last night, on the way back to my room, I happened to stop off in the Fleming House Library. After looking around, I noticed that the portrait of Barry Robert Krueger (June 29, 1990) had been pruned. Former Resident Associate of Fleming House, was crooked. So, I stood on the table to straighten it. It was at this time that I noticed that some one had taken some sort of a picture and possibly even a copy of Barry’s pupils should be. Needless to say, I was extremely disturbed, but not completely surprised. And, I had already done anything.

Today, hoping that I was mistaken, I stopped again in the Library, this time with a friend. Upon inspection, it turned out that not only were there holes, but some one had also drawn over the pupils with a black ball pen. After finding this, I was the picture down, because at this point, I don’t think the Library is secure enough to store such a fragile possession.

As yesterday (Thursday) was the two year anniversary of his death, I thought perhaps this could be done to pay some sort of respect and perhaps even tragic. I can only hope that the responsible person(s) did not know Barry, because any one who did would be completely incapable of doing him, his family, Anita Harper, the remaining RA, and the members of Fleming House such a disservice. Barry was always there to help you with a big bear hug and he bearded grain (usually in a worn- out rugby shirt). I feel proud to know that Barry was a Big part of my life here at Caltech. He was one of the very few people who I truly ever had the pleasure to know, and I miss him dearly.

We, the members of Fleming House, will never forget him. Ever.

I am not sure why I am writing this. Only because I think it is complete dishonor to Barry and because I want everyone to Remember Barry Robert Krueger. One of the most important things that Barry did during their "college experience" is to remember, and to pass this recollection on to the next class of students. When I think of all of the people of which there are many who have had their lives (who will remain nameless), I am relatively sure that these stories will continue to grow and live for years to come. I am saddened by the fact that memories of wonderful people are not passed on as well. Barry was a Material Sciences graduate student whose brilliant life was cut short because of an automobile accident. He was a wonderful asset to the House and the Caltech community in general. He was loved by so many, and, other notable people who have touched our lives, should be remembered.

I don’t expect the guilty party to come forth. I just want them to know that I know who they are. We all have small pranks. Irreparable damage has been done, and money has nothing to do with it. At least take a few moments to remember, and to pass that memory on.

Sincerely, Jessica Anne Nichols, ‘93

THE CALIFORNIA TECH

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Crime & Incident Beat

crime tip: Don’t leave your sleeping roommate behind to protect your goods.

10/21 A Scouve left her room unlocked while attending classes. When she returned she discovered that her answering machine had been stolen. ($100)

10/22 A cable TV box was stolen from the Braum House Lounge. The cables were cut. (Remember that these folks had their television stolen over the sunmer). ($200)

10/23 A black leather jacket was stolen at (of an open office on the first floor of BBM. ($200)

10/23 Daherys traditional autumn courtyard fire was extingushed by the Pasadena Fire Dept. A neighbor on California Blvd. reported the blaze. ($0)

10/24 The rear wheel was stolen from a Peugeot bike locked on the south side of Steele Lab. ($60)

10/25 A student from the first floor of Page left his room door open for a short time. When he returned he found a guy leaving his room carrying his boom box. The student yelled at the thieft, but he didn’t stop. When the student entered his room he found that $100 cash was also missing. His roommate slept through the entire episode. ($300)

10/25 One of the Ricketts pinball machines had its coin box pried open. ($20)

10/26 Fire alarm in Fleming was set off by a frisbee. ($0)

10/26 Over past month, the lighthulks in the walkway by Annex have been deliberately unscrewed on six occasions, thus making the walkway quite unsafefor use. ($60)

10/27 A juvenile was found stealing aluminum cans from the recycling center. He was advised that he was trespassing on private property. ($0)

10/27 A very careful thief apparently stuffed a paper towel in the strike plate of a room on the third floor of Noyes. Then when the office was vacant for a short period of time, the thief returned and stole a bicycle from inside. Nothing else appeared to be taken. The paper towel was found still jammed in the strike plate. ($100)

This Week’s Total: $1188

The Tech will meet in the Coffeehouse at 12.15 pm today. Come and explore opportunity. Free Pizza will be provided.

World News

Hay Le

U.S.-Vietnam Relations
President Bush announced that the Vietnam War is nearing its com­pletion as Hanoi agreed to open archives on missing American soldiers and that both nations are approaching normal relations. He has already authorized humanitarian aid to the Vietnam but is still seeking a full account of the 2,226 Americans still listed missing.

Canada
A package of constitutional amendments, written to keep the country united, was passed by the Canadian voters. The future of Canada is now uncertain. The French-speaking province Quebec might now move toward independence, the current Prime Minister may be replaced.

Yugoslavia
Election votes at the end of the year will offer the people of Yu­goslavia a choice between peace or condemnation as an outlaw state. However, a ballot for peace, which would depose the current Serbian President, Slobodan Milosevic, may spark civil war if Milosevic goes to extremes to stay in power.

Bosnia
A new study conducted by the U.S. government at the request of the U.N. Security Council reveals thousands of atrocities committed during the continuing ethnic struggle in the remains of Yugo­slavia. Serbian forces were accused of committing war crimes, but Muslim Slavs and Croats were also held responsible.

Another U.N. report warned that the Muslims in Bosnia-Herze­govina are facing virtual extinction from ethnic cleansing by the Serbs, unless foreign countries act to save them before winter.

Russia
A conservative opposition President Boris N. Yeltsin’s gov­ernment conducted its strongest protest by rallying demonstrations in 60 cities. As a result, Yeltsin banned the National Salvation Front, the opposition group, in a move that even his allies have denounced as anti-democratic, as well as Parliament’s elite guard unit.

China and Hong Kong
The Chinese government threat­ened to confront Hong Kong if they continued or with democratic reforms before the colony returns to China in 1997. China plans to undo any reforms it disapproves of.

Sino-Japanese Relations
Japanese Prime Minister Azabu visiting China to improve relations between the two countries, expressed deep regret for Japan’s aggression on China in the past. The apology now opens doors for economic cooperation and greater diplomatic closeness.

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October 30, 1992

3
The election results are in:

**Bylaw Amendments**

**Proposal 1 ("Undergraduate Only" clause):**

- Yes: 213
- No: 15
- Abstentions: 7

**Proposal 2 ("Associate Dean" clause):**

- Yes: 206
- No: 19
- Abstentions: 7

**Proposal 3 ("Sidebar" clause):**

- Yes: 213
- No: 14
- Abstentions: 8

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Korhan Gurkan

Last week, we did not have a meeting since there was not a quorum. This week, we even have a new member; Jonathan McDunn, the new Director for Academic Affairs.

While CREF is officially true, it is not the sound system, Frez? This time the problem is that the ASCIT Movies people have been missing Friday dinners since they're setting up the equipment. Pro wants some money for pizza and stuff. The BOD thinks he should approach Lee Reeves first. Reeves: I'm busy getting ready for Mudeo. TFM is supplying the food and Stan is asking for support from ASCIT, Y and Dean's Office. He needs $175 from ASCIT. The BOD decides that the money should come out of Derek's Budget (7-0-0).

Speaking of Derek, there is no Halloween Party this weekend mainly because the houses could not get together due to some organizational problems. I guess we'll have a party at the new gym some other time. Well, as for this weekend, go to some other school.

Meanwhile, Blacker gets their $300 for the term.

At this point, Amit realizes that it's about time that he introduces us to our newest member. Hi Jon, this is Ben Smith, the IHC. Cha... Ben... Ben... Hello... I guess Ben is not at the meeting again. WHERE IS BEN? Jon is sworn in. It's now official. By the way, all the BOC amendments and the paid BOD trip to Mayorka were approved at the elections on Monday. (Alright, I just made up the last one. Relax, it's not true.) Mike thanks everyone who voted. Speaking of elections, all foreigners, don't forget to mock the vote on Friday at the Red Door Cafe. I guess the rest of you will have to wait for Tuesday.

President's Dinner: The student officers were at a dinner earlier on this evening with some administrators. Our kind hosts were Mr. & Mrs. Everhart. (Nice house by the way) We discussed a lot of different issues concerning the undergraduate life at Caltech. Both parties seemed to have a positive attitude in trying to solve the problems. But, I guess the bottom line was communication. Folks, if you have a complaint let people know about it, especially the ones in charge. It's important that both parties have an understanding of each other, so that better things can be done.

Committee: SIGN UP!!! Have put up signs for the Academic Policies, Grievance and Athletics committees outside the ASCIT Meeting Room/next to the DRL's Office). Also, the Women's Center needs one undergrad on its Advisory Board and one on its Director Search Committee. There are also signs for these. You can sign up for both.

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**ENTERTAINMENT**

**Fixin' to Die** is an informative, and touching, depiction of Lee Atwater.

David W. Hogg

This article is the first in a series of reviews of arts-related activities that can be performed without a great deal of money or the use of a car. This week, I review a play at the small, inexpensive Tamarind Theatre in Hollywood. Lee Atwater (1954-1991) was the engineer of George Bush's 1988 presidential election campaign.

Before that, he had worked on the campaign of his friend and fellow Republican senatorial candidates, and on the presidential campaign of Ronald Reagan in 1984. Among other instances of negative campaigning, he credited with masterminding the "Willie Horton" ad campaign, which, in effect, accused the Democrats of being responsible for a rape and beating by Mr. Horton while he was out of jail on a weekend furlough. Mr. Atwater was a great demonstrator in that he underlined the American populace, and he knew how to appeal to their senses of injustice and disillusionment. He realized that MTV was the key to converting young audiences, and that a concentration on welfare spending and crime would attract the white lower-middle class. His success with the 1988 presidential campaign is said to have steered the 1992 Republican presidential campaign's success away from the leaders of Mr. Atwater.

"Fixin' to Die" is an attempt to depict Mr. Atwater (played by Bruce McIntosh) during the times that the American public never saw him. Robert Myers's script portrays Mr. Atwater as he tries to convince Ronald Reagan to advertise on MTV, as he gets the idea for the Willie Horton campaign at a motorcycle convention, and as he explains his overwhelming stress and nagging depressions to his wife. Mr. Myers points out, correctly, that Mr. Atwater did not invent negative campaigning; he was just very good at using it. He was hired to get Republicans into office, and he succeeded.

The performance is very fast, funny, and informative. It concentrates on the political and not the personal, but despite this we get a sense of Mr. Atwater as a very driven, energetic, and somewhat unjustly-vilified individual. Those that called him "racist" and "hateful" may have been projecting onto the man characteristics of the system that he employed. By the end of the play, the audience is said to see a man die, not relieved to see a bad influence removed from American politics.

"Fixin' to Die" is one-man show, with all characters played by either Mr. McIntosh or life-size cardboard cut-outs. The staging is simple, and the style is reminiscent of stand-up comedy, which augments the script's humor. I felt compelled to complain about the sluggishness of the Tamarind's spotlight, but other than that, the minimal production works well on a piece devoted to a single mind.

I expected "Fixin' to Die" to be a somewhat tasteless diatribe against Mr. Atwater's political activity. However, it turned out to be a fairly humorous and sympathetic portrait of a man who was widely regarded as neither humane nor sympathetic, and whose influence on American politics was huge. I strongly recommend this play, both as a document of history and as a piece of art.

Bruce McIntosh plays Lee Atwater in "Fixin' to Die" at the Tamarind Theatre.

After the show, check out the Bourgeois Pig (5931 Franklin Ave., Hollywood, 213-962-6366), a couple of store-fronts up the street. The espresso is thick and smooth, if expensive, and you can cut the melodramatic, post-modern atmosphere with a knife.

"Fixin' to Die: A Visit to the Mind of Lee Atwater" at the Tamarind Theatre, 5919 Franklin Ave., Hollywood, 213-465-7893, Thursdays and Fridays at 8:00 p.m. through November. Tickets are $15. KTD instructions: Take the 180 or 181 from (e.g. Lake and Colorado) in Pasadena to Gower and Hollywood Blvd. Walk North to the next major street, Franklin, and the theatre is three short blocks East.

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**The World Bank**

**YOUNG PROFESSIONALS PROGRAM**

The Young Professionals Program is one starting point for careers in the World Bank Group. It is designed for highly qualified and motivated young women and men in economics, finance, and specialized fields related to the work of the Group.

The program provides the opportunity for professional development through on-the-job experience and exposure to the Bank Group's operations and policies. Young Professionals start their work in the Bank Group with two six-month assignments in different departments. Treated as full-fledged staff members with specific responsibilities, they are expected to make significant contributions to the work programs of their departments. Each assignment typically involves at least one field mission.

Each year, about 40 people are selected for the Program, following an international competition to which more than 3,000 people apply. Candidates for the Program must have a master's degree or equivalent in economics, finance, or a technical field used in the Group's operations—or a minimum of two years' work experience in areas relevant to the Bank Group's operations, or academic work in the doctoral level. The technical fields of particular interest to the Bank Group are agriculture (extension services, irrigation), civil engineering, environment (solid waste management, industrial pollution control, water sanitation), and public health. All candidates are expected to have superior academic records. Work experience in a developing country is also required, and is particularly important in technical fields. In addition, fluency in English is required, and speaking proficiency in one or more of the Bank Group's other working languages—Arabic, Chinese, French, Portuguese, Russian, and Spanish—is a plus. Candidates must be 32 years of age as of next July 1 to be eligible.

The Program looks for five characteristics when recruiting Young Professionals:

- Strong analytical skills, demonstrated by academic success and other achievements;
- Flexibility and the capacity to work in more than one part of the organization;
- Enthusiasm for, and a commitment to, development work;
- Maturity, tact and diplomacy;
- Interpersonal and communications skills working for an international organization.

Most selected candidates exceed the minimum criteria of education and experience. In the past, more than half have had training at the doctoral level, and those with master's-level education typically had more than three years' professional experience.

Applications for the Young Professionals Program must be received by November 10. Offers are made to succesful candidates the following March. Applications may be obtained by writing to:

**The Young Professionals Program**

The World Bank
Room 0-5083
1818 H St NW
Washington DC 20433
State Ballot Measures: Propositions 155 - 167

Chris Echoles

Proposition 155
Would authorize the State to sell $900,000,000 in bonds to fund the building and renovation of 12 schools. Total cost to the State, over 20 years, is estimated at $1,600,000,000.
Pro: 1. Increasing enrollments demand more schools.
2. Schools need to be made earthquake safe.
3. New school construction and old school renovations will create jobs and boost the economy.
Con: 1. The State’s budget needs to be cut, the State cannot afford another bond issue.
2. The State is required to spend at least 40% of its bond funds on the schools that would be plenty if it weren’t wasted on inefficiency.
3. School bonds are better than public schools.

Proposition 156
Would authorize the State to sell $1,000,000,000 in bonds to finance the construction of the State-owned transportation system. LA Blue, Green, and Red Lines and Metrolink are eligible for funding. Intercity rail service would also be financed. If the bonds are sold at 7% interest, the cost to the State would be $1,700,000,000.
Pro: 1. Would reduce traffic congestion and air pollution.
2. Would put people to work.
3. Would fund projects that are already ready and planned to do.
Con: 1. Too expensive.
2. Transportation bonds authorized in 1990 are not all sold.

Proposition 157
Would make toll roads owned by the State and leased to private companies free from 35 years after the company’s lease expires.
Pro: 1. Should toll roads be stuck with worn out highways. Also, the money for the roads would come from somewhere—probably higher taxes.
Con: Proposition 157 would make toll roads owned by the State and leased to private companies free from 35 years after the company’s lease expires.
Pro: 1. The current law is unfair because it provides property tax exemption to disabled veterans and their spouses, but it does nothing for the spouses of veterans killed while on duty.
Con: Prop. 160 is unfair because it discriminates against those whose spouses died after leaving military service and those whose spouses died in other dangerous services such as the police.

Proposition 161
Gives the mentally competent adult the right to request assistance in dying from a willing doctor when a terminal condition is diagnosed.
Con: Concerns over consent.
Prop. 161 would give the mentally competent adult the right to request assistance in dying from a willing doctor when a terminal condition is diagnosed.

Proposition 162
Would give the governing boards of various public pension systems, such as the Public Employee’s Retirement System, control over their own assets.
Pro: 1. Would prevent the legislature from taking money from the pension funds of state employees.
Con: 1. Would give control of public pension funds to governing boards that aren’t controlled by any elected body.

Proposition 163
Eliminates sales and use taxes on certain foods, including candy, bottled water, and snack foods. “Snack foods” are cookies, crackers (but not Graham crackers), potato chips, snack cakes and pies, corn and tortilla chips, pretzels, things made out of granola, popped popcorn, fabricated chips, and fabricated snacks.
Pro: 1. Would reduce State revenue by $330,000,000 and local government revenue by $120,000,000.
2. Sales tax on food products places a greater tax burden on those who can least afford it— the poor.
Con: The State needs money.

Proposition 164
Places a term limit on members of Congress from California. Beginning in 1993, Prop. 164 would limit the term of Representatives to six years out of eleven, and Senators would be limited to twelve out of seventeen years.
Pro: 1. This measure will keep legislators’ ‘‘in line’’ and will prevent career politicians.
Con: California’s term limits will constantly give junior Congressmen and will therefore lose power in Congress. The proper way to remove politicians is not to vote for them.

Proposition 165
This measure concerns two things.

Proposition 166
Would require employers to provide health insurance to employees who work more than 17.5 hours per week, with most of the expenses going to the State. The State would help out small businesses of 25 or less employees by means of a tax credit. Four small business employees would be provided with quality health insurance.
Con: Just what is the role of government, anyway?

Proposition 167
State sales tax would be reduced from 6% to 5.25%. Tax rates would be increased 1% (from 11% to 12%) for couples earning over $500,000 and individuals earning over $250,000. The State would help out small business of 25 or less employees by means of a tax credit. Four small business employees would be provided with quality health insurance.
Con: Maybe we should think about what government is really for. Maybe the guys who wrote the Constitution had something else in mind....
Marcus

There are some problems like that. Here, it’s the experiment that’s new, and hasn’t been tried before and we can do it. For example, in the liquid-liquid electrolyte transfer, we’ve published several papers in which we have now been used to compare with other data and results. It has turned out that certain aspects are just fine, but there are some results we just don’t understand yet—there’s something missing, and by significant numerical factors, and there’s some sort of discrepancy. It could be due to several possibilities. The topic was something we thought was easy, that we would derive the equations and see relationships. Now that we’ve studied it we see that there are things in it that are not yet understood. There is a clear need for more experiments. At present there’s only one experiment, so to speak. But we need a whole family of experiments to see whether the deviations that have been found are systematic or not, and what their nature is, what their nature is. One needs more experiments of rapid electron transfers of metal electrodes, since we use such data to treat these liquid-liquid electrolyte transfer results. In any event, the combination of the theory with the experiments suggests new experiments and may, if necessary, lead to refinements of the theory for this particular system. Anyway, a problem we thought would be a snap but that should be treated turned out to be more than we anticipated, and certainly stimulated the environmentalists involved to design other related experiments. So even the problems you think will be no problem may turn out to have puzzles in them. But certainly some of the puzzles we worked with had puzzles in the very beginning. One difference between research and solving problems, math problems for example, is that in the former you often don’t know if you will find a solution. There seems to be an aspect to research that sometimes we don’t recognize. Nature has far more “imagination” than we have, and if we try to work on the experiments that Nature provides, there is, in many cases, a chance of doing things that are more interesting than if we just wander around with a theory looking for the experiment. Sometimes that way we can get a new theory but perhaps one gets the unusual theory by trying to understand some experiments that we think we do not cover well-mineralized material. There’s a richness and unexpectancies in Nature. Dr. Are there any changes in how you students regard you?

I hope very much there aren’t any changes, because I don’t feel any internal change. I’ve always been friendly to the students, and hopefully it will just be the same way.
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8 October 30, 1992

WHAT GOES ON

Attention Swimmers - All Caltech and JPL personnel are invited to join the Caltech Masters Swim Team. Practice is on Monday through Thursday evenings and Saturdays at the Red Door. We have very experienced coaches and are working very hard to improve speed and endurance as well as stroke technique. Swimmers are accepted from range from varsity level to top novice. Imagine the commitment at 12:15 am, plus the additional hours of practice. The team has the top swimmers in the West and can compete with any team in the West. Contact Don Byrd at 792-2729. Also open to the public and free.

Gay, Lesbian, Bisexual Support Group - Meets from one o'clock and third Tuesday at 7:30 pm in the Health Center Library. The casual conversational meeting is open to all groups and includes a social component.

Tobacco Use - Another group that meets on the third Wednesday at 7:30 pm in the Health Center Library. The group is open to all and includes a social component.

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November 30, 1992

The annual Men's Scholarship essay contest is over again. The essay should contain clearly and concisely the applicant's academic, vocational and career goals. The only requirement is that the student be enrolled in an accredited college and institutional educational program. For further information contact Jim Doxey at 792-3089.

The American Society of Naval Engineers is sponsoring a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen, demonstrate a genuine interest in a career in naval engineering, and be applying for the first time in a one-year time program for one year of graduate study. All students in good standing in a junior or senior year of an accredited U.S. college or university are eligible. For further information contact the Public Relations Office at the ASN offices in February 15, 1993.

The American Scandians Foundation is offering scholarships for $1,000 to $3,000 for the 1993-94 academic year. The candidate must be a U.S. citizen in good standing in his senior year at an accredited U.S. college or university. For further information contact the American Scandians Foundation in P.O. Box 192, Santa Cruz, CA 95061.

The American Electromagnetics Society is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Electromagnetics Society in P.O. Box 192, Santa Cruz, CA 95061.

The American Association for the Advancement of Science is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Association for the Advancement of Science in P.O. Box 192, Santa Cruz, CA 95061.

The American Society of Civil Engineers is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Society of Civil Engineers in P.O. Box 192, Santa Cruz, CA 95061.

The American Physical Society is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Physical Society in P.O. Box 192, Santa Cruz, CA 95061.

The American Library Association is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Library Association in P.O. Box 192, Santa Cruz, CA 95061.

The American Psychological Association is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Psychological Association in P.O. Box 192, Santa Cruz, CA 95061.

The American Chemical Society is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Chemical Society in P.O. Box 192, Santa Cruz, CA 95061.

The American Society of Mechanical Engineers is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Society of Mechanical Engineers in P.O. Box 192, Santa Cruz, CA 95061.

The American Association of University Women is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Association of University Women in P.O. Box 192, Santa Cruz, CA 95061.

The American Institute of Electrical Engineers is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Institute of Electrical Engineers in P.O. Box 192, Santa Cruz, CA 95061.

The American Society of Chemical Engineers is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Society of Chemical Engineers in P.O. Box 192, Santa Cruz, CA 95061.

The American Society of Biologists is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American Society of Biologists in P.O. Box 192, Santa Cruz, CA 95061.

The American College of Radiology is offering a $2,000 scholarship for the 1993-94 academic year. The candidate must be a U.S. citizen who is enrolled in an accredited college with a minimum of a 3.0 grade point average. For further information contact the American College of Radiology in P.O. Box 192, Santa Cruz, CA 95061.

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