# EX-Ls
# EX-PRESS


## Volume 22 Number 3
## Summer 2004


### In this issue:



**Luncheon Reservations to Bud Larsh**

Please send your luncheon reservations to Bud Larsh at the Ex-Ls Official address: PO Box 5280, Hercules CA 94547.


The EX-Ls Board of Directors and members gratefully acknowledge the Lawrence Berkeley National Laboratory Administration for their continuing support.

Volume 22 #3: Summer 2004
(Published July 2004)

## PRESIDENTS MESSAGE

Sig Rogers

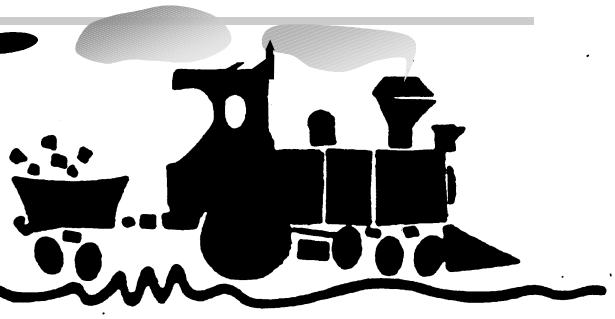
Time flies when you're having fun. Here it is the middle of July already and the vegetables I was to plant early this year still haven't been planted and will probably get put off to next year as other major chores (I won't go into here) take precedence. It's not as if I'm not doing anything, it's just that I'm having fun and that takes a lot of time.

After our last lunch on May 20th Cindy and I flew to London. We spent a leisurely week there in a small Bayswater hotel adjusting to the time zone, doing walking tours, the "Lion King" and a day out to the Weald of Kent. We then picked up our rental car, an Alfa Romeo, and began our adventurous drive through London traffic, heading for a two week driving tour of England, Wales and Scotland. Returning to London, we spent a couple of days at the Thistle Tower Hotel (booked through NCL our cruise ship company). Our room was so close to Tower Bridge you could almost touch it. We embarked from Dover on a 12 day cruise with stops and side trips to Hamburg and Warnemunde in Germany as the ship traversed the Kiel Canal to the Baltic Sea. We then made stops at Stockholm, Sweden, Helsinki and Porvoo, Finland, and St. Petersburg, Russia, then back through the Baltic to Copenhagen, Denmark. We returned to Dover through the North Sea. Each of these stops has stories to go with them. Hopefully it will soon get documented for the newsletter.

Inge Henle has resigned as Activities Coordinator. I wish her well and we will miss her dearly. Meanwhile Tom Beales is filling in coordinating with Spengers. Please mail your lunch checks on time to Bud Larsh. No volunteers have stepped up as of yet to replace Inge as Activities Coordinator. Please consider this opportunity. At the last lunch there were a number of people unhappy with the tight spacing of the seating arrangements. Tom Beales will make our concerns clear to Spengers.

As of this writing, we still don't know the final status of the Lab's funding for EX-L's membership in the UC Retirement Center. However, in my conversation with Richard Takahashi this morning, he said that the Lab is supporting EX-L's for a membership of two years. He is preparing a purchase order. It is subject to FY05 funding and final approval will not be known until after October. Meanwhile our membership continues and we should take advantage of the offered programs.

There has been concern among the EX-L Board about our lack of a clear policy for making charitable contributions when those occasions arise. It is the consensus of the Board that contributions should be limited to local charitable organizations that directly benefit needy seniors. If you disagree with this, please contact me.



**2004 Summer Lunch**

**Date:** **Thursday, August 19, 2004**

**Where:** **Spenger's Fresh Fish Grotto**
**1919 Fourth St.**
**Berkeley**

**Time:** **No-host Bar: 11:30 AM**
**Lunch Served: 12:00 Noon**

**Speaker:** **George Reyes, Director, Facilities Division, LBNL**

**Subject:** **The Laboratory's Long Range Development Plan**

**Menu:** **Bay Shrimp Louie Salad (with cup of chowder)**
**Salmon (with dinner salad)**
**Flatiron Steak w/mushroom demi-glaze (with dinner salad)**

**Cost:** **$18 per person (PREPAID)**

**Reservations:** **Payable to EX-Ls. Send to Bud Larsh**
**PO Box 5280**
**Hercules, CA 94547**

**Spenger's management policy makes it absolutely imperative that they receive reservations by August 13, 2004**

**(Reservation slip on last page)**

## From our February lunch

*Reported by Gene Binnall, EX-Ls First Vice-President*: Our speaker for the May 20th Luncheon was Professor Robert Full of the Department of Integrative Biology at UC Berkeley. His topic: "Bipedal Cockroaches, Galloping Ghosts and Gripping Geckos: Bio-inspired Robots, Artificial Muscles, and Adhesives".

Professor Full directs the Poly-P.E.D.A.L. Laboratory at UCB, which studies the Performance, Energetics and Dynamics of Animal Locomotion (P.E.D.A.L.) in many-footed creatures. His fascinating and entertaining presentation made it clear why he can count among his honors a Distinguished Teaching Award (1996), a Chancellor's Professorship (1997), and a Goldman Professorship for teaching (1998).

Integrative Biology examines many levels of organisms operating across the full range of landscapes from the molecular to the ecosystem, employing several disciplines beyond what we normally consider the biological, including engineering, mathematics, and computer science. It had its origins in Leland Stanford's famous bet with a friend that "horses run when they are trotting". That is, that all four hooves are off the ground at some point during each stride. To prove his point, he hired a famous photographer from San Francisco, Eadweard Muybridge, to take a rapid sequence of photos with a new type of camera. (Stanford won his bet.)

Professor Full and his students use the same basic principles in their lab today, except that they use digital high-speed video cameras that capture more than 1000 frames per second, and they have six of them. They now study such things as a cockroach running on a treadmill. Other fascinating action video examples that he showed included a scorpion (8 legs and a tail), an ant and a cockroach (6 legs each), a 44-legged centipede, and an 8-legged sideways galloping ghost crab that can go up to 4 meters per second as it runs sideways on the beach.

The animal's leg motions are studied by taking high-speed video images up through the bottom of a glass plate as they run, then making computer models to study the motions of all the legs to understand how they move, individually and collectively. A "force platform" is used to measure forces up-and-down, side-to-side, and back-to-front. More detailed measurements of the force exerted by each individual leg are made by photographing up through a photoelastic material with a polarizing filter above and below, and measuring light transmission through the material. The more force from each leg, the more light that is transmitted through the stressed material. The first time that Full did this with one of his undergraduate students, she purchased Jell-O from Safeway as the photoelastic material, which worked quit well except that she had purchased orange flavored Jell-O. The problem is that the animals stopped to eat the Jell-O. They now use unflavored Jell-O, and it works "beautifully well".

Full believes strongly that one key to the richness of his research results is the diversity of the organisms that have been studied by his team. Whether you have two legs, four legs, six legs, or eight legs you run using the same pattern. Multiple legs on each side work in simple coordinated patterns similar to the function of each leg of a human. When you run, your legs act like spring-loaded inverted pendulums, i.e., pogo sticks.

Full showed a video of an American cockroach, “the animal you think you don’t have in your kitchen”. At normal speed it used all six legs and moved with its body parallel to the treadmill, but at its highest speeds it tipped up and ran on only two legs much like a human sprinter. It becomes bipedal and can actually leave the ground. This type of study has led to some wonderful collaborations, such as working with Pixar on the Pixar/Disney movie, *A Bugs Life*. Further studies as a result of the work with the Pixar artists led to the discovery that side-to-side motion as these creatures ran provided self-stabilization. This turned out to be extremely important in the development of multi-legged stable robots. Additional collaborations have led to the development of new materials that provide tuned springy legs, even leading to research on artificial muscles. These collaborations have resulted in the development of relatively simple robots using spring-loaded legs that outperform the popular wheeled robots, especially over rough terrain. To illustrate his point, Full compared present Mars rovers using wheels, that confine them to relatively smooth flat surfaces, with a six-legged robot photographed moving over rough rocky terrain with little trouble. He even tinted the video orange for the proper Mars effect.

The gecko is one of the most extraordinary of the creatures in the repertoire of mini-beasts that Professor Full and his students have studied. This little lizard can move up a wall, or across a ceiling, even a smooth glass window, with the same ease that it moves across a horizontal surface. “Basically it can go anywhere it want.” Full showed a split video of two geckos running side-by-side at the relatively high speed of one-meter per second, one running up a wall and one running on the ground. We were challenged to tell which was which - not obvious, but our group did better than other groups before. “How can they do this?” Full’s team found that the answer is in their bazaar toes. [*Note to Gene: Beware of spellcheck! One doubts that the geckos got their toes at a bazaar. Ed.*] Part of the secret is that their toes rapidly uncurl and peel away from the surface as the gecko runs. The rest of the secret is that the gecko’s toes are covered with a billion or so microscopic hairs. They are so small that they can get close enough to the molecules of the surface over which the gecko travels for intermolecular forces of attraction to take place, i.e., Van der Waals forces (weak intermolecular attraction). The individual attraction of each hair is relatively weak, but billions of these forces make for very good adhesion. Working with Full, a UC Berkeley Engineering professor, Ron Fearing, has recently been able to synthesize the first self-cleaning dry adhesive out of polyurethane by simulating a simpler form of hair. UC holds the patent, and the applications are endless - everything from adhesive for Band-Aids to robots that can inspect NASA shuttles and satellites while in space. It can move computer chips in a vacuum without scratching them, and it even works under water.

Professor Full’s research has been featured in the popular press such as newspapers, various science magazines, and on several television shows (CNN, NBC Today Show, ABC World News Tonight, Discovery Channel). I recently received my July 2004 issue of *Discover* magazine and found another article covering his research, “Building the Perfect Pest: Inspired by roaches, a biologist creates robots that wobble but don’t fall down”.

You can go to the following web sites for additional information on Professor Full's work and some darn good video clips:

http://www.berkeley.edu/news/media/releases/2002/09/rfull/rfull.html
http://www.berkeley.edu/news/media/releases/2002/08/26_gecko.html
http://polypedal.berkeley.edu/Bioinspire/Robotics.html

*Table Talk in May:* Elmer Silva reports that it can be rewarding to get the lead out. He supervised the removal and recycling of waste lead from the Richmond Rod & Gun Club range. (There was more than 45 tons of the stuff!) The Shigleys are enjoying the wild life in Placer County. (Actually, it's just the wildlife: turkeys, peacocks, ducks, geese, coyotes, foxes, deer, a mountain lion, and lots of miscellaneous birds.) Sybil Donn (known as Bif Cole when she was at the Lab in the 50s) enjoyed her first visit to an Ex-Ls lunch. Hester Yee also made a rare visit, "thanks to Kay "Ducky" Lucas". She's been spending her time traveling and in Iowa, which is quite different from the Bay Area.

Others with travel-related stories include the Francks, the Dahls, the Kaufmanns, the Stevenses, the Kadyks, and the Rogerses. Jack and Darlene were at his Navy reunion in Chicago, and claim that the traffic to and from O'Hare is even worse than Bay Area traffic. Eleanor and Per did sand and stars in Arizona: San Xavier del Bac, Kitt Peak, Sedona, Barringer Meteor Crater [the only place I know where they built a free-standing brick wall just so they could put a hole in it to frame a beautiful view of Mount Humphries…Ed.], Lowell Observatory (where the Martian "canals" were first seen and Pluto was discovered). They also inspected the Grand Canyon both by helicopter and from the Rim Trail. Bob and Barbara are looking forward to their third river barge trip this summer, this one on the Missouri River. Sally and Dave discovered that Mapquest sometimes does things that a human would consider odd, such as routing us right through downtown Manhattan at noon on a workday, right in front of the Empire State Building, on our way from Easton, MD to Bridgehampton, on eastern Long Island. It (Mapquest) also doesn't know about construction projects. (Sigh.) This can be a problem in an East Coast spring, when all routes are under construction somewhere.

John and Ann went birding in the eastern Sierra, following a guide map they received from Marie Alberti. Lots of dirt roads. [Perhaps Mapquest isn't so bad after all!] Whitney Portal, June and Mono Lakes, bristlecone pines and fantastic views in the White Mountains. Cindy and Sig are off to the UK to tour around before cruising some northern capitals. A highlight of the trip will be a visit to the Amber Room (dismantled during WW II, but relatively recently remounted) in Puskin, just outside of St Petersburg.

The virtual doorprizes (there was a mixup and the prizes failed to attend the luncheon) were won by Terry Powell, Dick Baker, and Bob Everett. Bud Larsh promises that virtuality will become reality no later than the next luncheon.

*Luncheon Attendees:*

| | | |
|---|---|---|
| Jose Alonso | Shirley Ashley | Winnie Baker |
| Al Amon | Bill Baker | Josephine Barrera |
| John Anderson | Dick Baker | Tom Beales |

Bill Bigelow
Gene & Myrna Binnall
Bob & Elizabeth Birge
Stan Boyle
Dick Burleigh & guest
Edith Goldstien
Geores & Katie Clevenger
Buttner
Winifred Corniea
Per & Eleanor Dahl
Janis & Ned Dairiki
Sibyl Donn
Andy DuBois
Robert & Judy Everett
Warren & Averil Faust
Jack & Darlene Franck
Bob Fulton
Bill Gilbert
Lee Glasgow
Abe & Marjorie
Glicksman & guests
Don & Bert Miller
Jim Haley
Inge Henle
Nylan Jeung
Muriel Johnston
John & Ann Kadyk
Robert & Barbara
Kaufmann
Spencer & Mary Knoll
Ralph Kujala
Bud Larsh
Branko Leskovar
Ken Lou
Katherine Lucas & guest
Hester Yee
Jo & Ed Lundberg
Don & Jean Lundgren
Fritz & June Marg
Bob Meuser
Bob Miller
Terry Powell
Ken Mirk
Bob Mortiboy
Fred Perry
Don Prestella
Sig & Cindy Rogers
Doug & Claire Shigley
Elmer Silva
Dave & Sally Stevens
Dick Wolgast
Speaker Robert Full

**Editor's Note**

Table Talk wasn't quite the roaring success at the May lunch as in February. But we'll keep at it for a while longer, anyway. If you can't attend lunch and have anything you'd like to say to the membership, send it along. If it's not scurrilous, obscene, or a blatant sales pitch, we'll print it. Please note that the masthead has been modestly redesigned to allow inclusion of the names of Ex-Ls life members. (Life membership is conferred by the Board for enduring meritorious service to the organization.) Also note that the fish choice for the August lunch will be salmon rather than sole. Letters, articles, and ideas for articles may be submitted via e-mail (david_stevens@comcast.net or stevens@lmi.net) or snail-mail to Dave Stevens, 1107 Amador Ave, Berkeley, CA 94707, or even telephone (510-524-2904). ***NOTE: The deadline for newsletter submittals is 10 days after the preceding Board meeting.*** *See the back page for meeting dates.*

dfs

**Vale atque ave**

As this issue is being constructed, the Lab is in some sense between directors. Right after giving his final "State of the Lab" address (see the June 25 issue of the *Berkeley Lab* ***View***), outgoing director Chuck Shank set out for Hawaii as a participant in the 2004 Pacific Cup race (on Wednesday, July 7, Chuck's boat *First Light* was about in the middle of the pack in Division A), while incoming director Steven Chu was house-hunting in Berkeley in anticipation of his August 1 "phase transition". Dr. Chu's career has been bi-coastal, beginning in New York (Brooklyn and Rochester), and including stints at Bell Labs (where his boss for a while was Charles Shank) and Stanford. Along the way, there was graduate work at UCB and the Laboratory (88-inch cyclotron and Hilac), so that despite his 17 years at Stanford he can—and did—say that coming to the Lab "actually feels like a home-coming." Welcome home, Dr. Chu.

### *Berkeley Lab View* available

All members of Ex-Ls are entitled to receive a complimentary copy of the *Berkeley Lab **View***, the newsletter that looks a great deal like the *Currents* used to look, but is less concerned with the Lab calendar. (That function has been taken over by the Lab's daily e-mail.) If you have not been receiving the View—and would like to do so—please contact the Lab's Community Relations Office, 415-486-7292.

### Requiem for a Crane
**Ken Lou**

"Gone, But Not Forgotten: Removal of historic Bevatron High Bay completed." That was the headline in the April 2, 2004 issue of the Berkeley Lab View for the laudatory article on the demolition of the Bevatron's EPB (External Proton Beam) Hall. I would like to turn the pages of history back still further, to the beginning of that structure, relying entirely on my memories from a more-than-twenty-year intimate working association with the Bevatron/Bevalac complex.

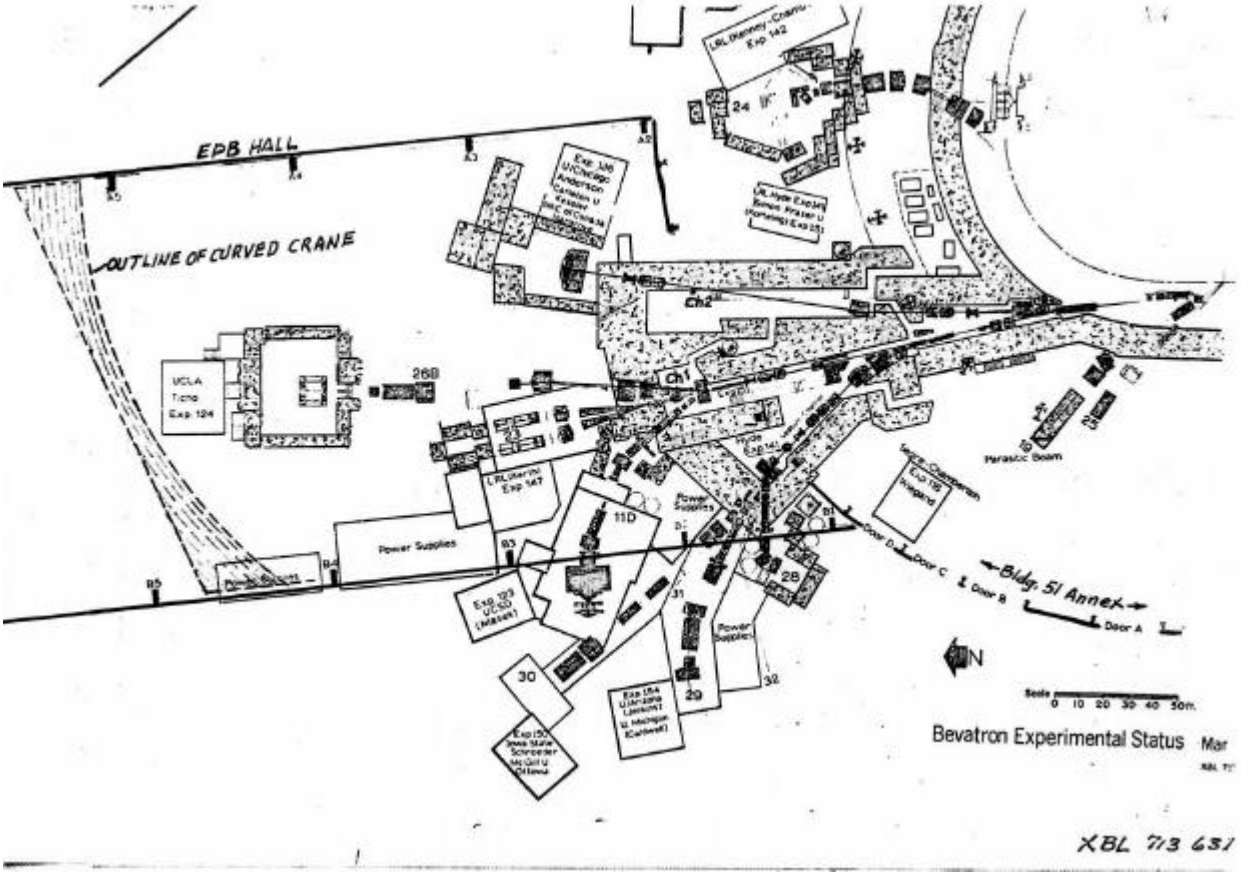
Because the EBP Hall was sited directly on non-engineered landfill over Blackberry Canyon, some of the foundation piles had to go down about 120 ft. to reach strata good enough to satisfy the geologists and structural engineers. That was a relatively straightforward problem compared to the problems posed by the necessity to connect the rectangular form of the Hall to the circular form of the Bevatron's Building 51 at an unconventional angle dictated by the line of the principal external proton beam as it emerged from the wall of the Bldg. 51 annex. (The beam, which determined the axis of the Hall, was more nearly tangential to the curve of the Bevatron than radial.) Furthermore, we had learned during the set-up of the early experimental beamlines that we had to minimize structural supports in the Hall to the greatest extent possible, because columns were unfailingly in the path of the desired beamline or some large magnet or the necessary shielding or detection equipment. So the Hall had no interior columns: only widely-spaced exterior columns with long-span roof trusses. (See the drawing below.)

An even more intriguing problem was the overhead crane necessary to transport beamline components such as 30-ton magnets, concrete shielding blocks, detectors, etc. to various locations throughout the Hall. Walt Hartsough proposed a uniquely innovative curved crane that would follow and hug the curved exterior wall of the Bldg. 51 annex. When he presented the proposed crane to the Directors, they were skeptical, to say the least, even though he demonstrated its stability with a simple model. (It was a bit too radical, it seems, even for people on the forefront of science.) However, the crane builder came up with a compromise design: a long beefy straight girder with a curved beam attached to carry the curved tracks which in turn carried the trolley with its lifting hooks, the various mechanisms, and the operator's cab. The odd angle of the Hall required that the straight girder be skewed, and not normal to the column line, as would be the case with any conventional self-respecting crane, but this was found to be acceptable, and the resulting design was implemented.

I was fortunate enough to be on hand the weekend day the main assembly was being lifted into place on the rails in the framed (but not yet enclosed) Hall. When I read the View article I had to search my archives to find the slides of that event and put them through my projector and wallow

in nostalgia. I had never ceased being fascinated by the movements of that crane as it traversed the Hall. Bird watchers may be thrilled by birds in flight, but for me that unconventional and outlandish crane rolling the length of the Hall was a sight unreal enough to leave any viewer questioning his or her eyes. That skewed behemoth moving along was sure to call to mind a crab scrambling sideways. In all my years with the Bevatron/Bevalac, the rumbling of that crane rolling along always stopped me in my tracks to look up and experience a momentary wonderment at the sight of it slanting its way against the backdrop of the very normal roof framing.

And now it is no more.




[We apologize if you have trouble reading the diagram. It's a 1971 ME Department experimental status diagram, and never expected to be published in the Ex-Press. Ken added the outline of the crane and the walls of the EPB Hall. dfs]

## CUCRA Travel Interest Group

If you are interested in travel opportunities that might not be generally available, you should contact the CUCRA Travel Interest Group. (CUCRA is the Council of University of California Retiree Associations, of which the Ex-Ls is a member.) Their current offering is a 20-day tour of Australia and New Zealand. You may get specific information on this trip, or on the group in general, from Rosemary Norling (Rnorling@ ucsd.edu).

## Luncheon Logistics

Thanks to Maxine Adams and Myrna Binnall, who have volunteered to help with luncheon registration. We could use additional volunteers. This need not be a lifetime commitment: If we can develop a cadre of folks willing to help, nobody would have to work more than once a year. If you are interested, just show up a little early and volunteer. (No experience necessary; a ready smile is the most important qualification for the job.)

### Improved access to the Ex-Ls website

You can now reach the Ex-Ls website through two routes on the A-Z Listing on LBNL's home page: at the A-Z page, click on E; the Ex-L link is near the bottom of the list, or click on R and look for "Retirement Group: Ex-Ls Homepage"). You can also connect directly through www.lbl.gov/ex-L-express. If you haven't already done so, check it out.

### Position of Activities Coordinator is still vacant

We are still looking for someone to act as Activities Coordinator. For the most part, this involves negotiating the annual renewal of our contract with Spenger's plus working with the Spenger's staff and Treasurer Bud Larsh to coordinate the individual luncheons. Please see Sig Rogers or Gene Binnall if you are interested.

## New-member introductory offer

The Board has approved an introductory offer for new members: The organization will absorb the dues for the balance of the calendar year in which a new member joins. (This does not extend to the luncheon cost, however; the new member will still have to pay for those luncheons attended.) So if you know of former LB(N)Lers who have not yet joined Ex-Ls, you might suggest they give us a try while this munificent offer remains in effect.

### Death of a VIP

With all the sadness and trauma going on in the world at the moment, it is worth reflecting on the death of a very important person, which almost went unnoticed a few months ago. Larry La Prise, the man who wrote "The Hokey Pokey", died peacefully at age 93.

The most traumatic part for his family was getting him into the coffin.

They put his left leg in. Then the trouble started.

**IN MEMORIAM**

**Kenneth E. Bregger**
**Enola Converse-Carmen**
**Sam Dilla**

**WELCOME NEW MEMBERS**

**Ed Lampo**
**Donald Miller**
**Werner Schwartz**
**William Turner**

**If you have not already renewed your membership, or wish to become a new member, please send your check for $12.00, and the filled out form below, to:**

**Bud Larsh, Treasurer**
**610 Devonwood**
**Hercules, CA 94547**

If you have any questions, please call Bud Larsh, at 510-724-1202, or e-mail to AlmonLarsh2@juno.com.

Name: _____ Date: _____

Spouse: _____ Year Retired: _____

Address: _____

_____

Phone: _____ E-mail: _____

**SEE YOU AT THE AUGUST 19 LUNCHEON**

**To: Bud Larsh**
**PO Box 5280**
**Hercules, CA 94547**
**Be sure to make reservations by August 13**

**From: _____**

**I plan to attend the EX-Ls luncheon $18 PREPAID**

**I will bring __guest(s). Name(s) of guest(s): _____**

**Menu Choice(s): Beef __ Fish __ Salad __**

**Please make check payable to EX-Ls Total Enclosed: _____**

**EX-Ls EXPRESS – Summer 2004**
Published Quarterly in January, April, July, and October
Editor: Dave Stevens *Deadline for newsletter submittals is 10 days after the preceding Board meeting.*

**EX-Ls BOARD OF DIRECTORS**

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|---|---|
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| Howard Browne | Clay Sealy |
| Virginia Cherniak | Ethel Skrydlinski Thompson |
| Per Dahl | |

**Calendar of Board Meetings & Luncheons**

| | |
|---|---|
| | L: August 19, 2004 |
| B: October 14, 2004 | L: November 18, 2004 |
| B: January 13, 2005 | L: February 17, 2005 |
| B: April 14, 2005 | L: May 19, 2005 |
| B: July 14, 2005 | L: August 18, 2005 |

Board meetings take place in the LBNL cafeteria at 3:45 on the dates mentioned; we welcome attendance by interested members.

**Ex-Ls Life Members**

| | |
|---|---|
| Esther Colwell | Shirley Ashley |
| Frank Garnier | Inge Henle |
| Tané Nutting | |

**Official Address**
LBNL EX-Ls
P. O. Box 5280
Hercules, CA 94547

**Website:** www.lbl.gov/ex-l-express/
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