

Laboratory undergoes shielding assessments and upgrades

An important goal at Fermilab is to carry out our research so that the safety of people receives the highest consideration while at the same time we make the best use of our laboratory facilities.

— John Peoples, Director

Fermilab is currently conducting a site-wide shielding assessment. This review was prompted by the determination that the amount of existing earth shielding over a limited portion of the proton beam transport to the Meson Laboratory was inconsistent with guidelines as defined by the *Fermilab Radiation Guide*. Computer modeling of the shield using recent survey data indicated that it would be prudent to add more shielding than presently exists in the area.

To confirm the computer model results, measurements with low intensity beam were conducted on December 15 and 16. These studies verified that it would be possible under unlikely, abnormal operating conditions to produce radiation in excess of Fermilab's own guidelines.

Fermilab operates under very stringent health and safety guidelines. When the potential problem of the Meson line shielding was assessed, Director John Peoples called for a Laboratory-wide evaluation and announced his decision to suspend the operation of the fixed target experimental program until the review was completed and all shielding had been brought within the Fermilab guidelines. This evaluation has been an intensive effort which brought into play members of the Directorate, Accelerator

Division, Research Division, ES&H Section, Construction Engineering Services Section and Business Services Section.

According to Alex Elwyn (ES&H), "There is no evidence that any actual accidental beam loss in the proton beam transport area produced above-ground radiation in excess of the very conservative values allowed by Fermilab guidelines during fixed target running."

Criteria for evaluation

When evaluating the current shielding, employees looked at worst case scenarios and recommended maximum shielding protection. The Research Division shielding, according to Sam Childress (RD), "is being evaluated to guard against the potential of very rare beam accidents." For primary beam areas, the requirement is to withstand missteering of the full primary beam. For secondary beam areas, evaluation is for the maximum intensity which could be transmitted in the event that a primary target received the full machine intensity.

The Accelerator Division is also taking a very cautious view of radiation shielding requirements. For approximately 20 years, radiation shielding in the Accelerator Division has been based upon the same criteria. Due to the evolution of the accelerator system and safety culture changes, this criteria has been redefined. In the past, an "accident condition" was defined in terms of the amount of beam pulses lost per hour. The Accelerator Division is now examining the possibility of steady losses of beam rather than a

countable number of pulse losses. "One should keep in mind during this discussion," said Dixon Bogert (AD), "that there is no motivation to operate in a loss condition—there's no payback for sloppiness."

For both divisions, the standards required to be met are those detailed in the *Fermilab Radiation Guide*.

Scope of the evaluation

The scope of the shielding assessment was very complete. The entire Accelerator Division complex was reviewed. This review included the linac, booster, main accelerator, switchyard and antiproton source.

The Research Division assessment teams analyzed hadron and penetrating muon shielding. Their evaluation began north of the master substation for the Meson line and north of Road B for Neutrino, Muon and Proton beam lines.

Throughout the evaluation procedure, both divisions reviewed occupancy standards for all areas. Shielding requirements are more rigid for areas where people work or visit than for those where access can be restricted.

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Results of assessment

Accelerator Division - The total number of impacted areas evaluated by the Accelerator Division was not too large. The notable areas found were: the area where Road E crosses the accelerator near CØ; the area where South Booster Road crosses the accelerator near AØ; the area where Indian Road crosses Antiproton-2 and Antiproton-3 lines; the BØ overpass where the Main Ring rises to cross over the CDF detector; the area over the Transfer Hall at AØ and several small locations near vertical penetrations around the accelerator, or where for extremely local regions the earth berm height is slightly low.

Each of the above areas was carefully evaluated. The road crossings were given special care. In the case of the South Booster Road, the road will be protected by the use of interlocked detectors without any additional shielding. For Road E, however, that is not enough and the road will be closed until later in the year when the cryogenic lines under the road will be relocated. At that time, the road will be raised and steel will be inserted to increase the density of the shielding. Until then, the road crossing will be fenced and pedestrian passage across will be permitted for badged employees only.

In the case of Indian Road, where there are no cryogenic transfer lines in the way, steel will be added under the road immediately and neighboring earth berms will be slightly increased.

The most demanding requirements for increased shielding are imposed by the Main Ring overpass in the area of BØ at CDF. Intensive studies are now underway by Construction Engineering Services and outside consultants as to how much passive (earth) shield-

ing may be added in this region without damage to the underground enclosures. Therefore, the exact solutions which will be implemented in that area are not yet known.

Research Division - Results of the Research Division assessment to date indicate the need for several upgrades. Implementation is currently underway in many areas, while evaluation continues in others. Included in shielding upgrades in progress are: Road B has been excavated and steel plates added to the existing ones above the Neutrino beam lines; expanded berm cover has been added in sections of the Proton area earthen berm; additional dirt will be added in the Muon area on the berm; a removable berm will be added to the Neutrino rail spur access; the most significant addition of dirt in the Meson area will be in the primary beam transport region between the north side of the master substation fence and MØ-1; the small access road across the berm at the edge of the substation is being closed; the east side of the Neutrino berm will receive an increased dirt cover over a significant region; fencing in the Proton area is being added in areas near the Pagoda building to supplement existing fencing; the access road south of the Pagoda will be closed during fixed target operations, but secured by gates which can be opened during extended down periods; extended fencing will be added along the berms shielding beam transport lines for the Muon, Meson and Neutrino areas—a total of about 14,000 feet of fencing is being added to the Research Division beam line system.

Documentation procedures

According to Wayne Nestander (CES) the shielding review has also brought about changes in established

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Types of monitoring and protection upgrades

In areas where shielding was found to be inconsistent with guidelines, determinations regarding the type of shielding upgrade had to be made. Included in the shielding upgrades currently in progress are:

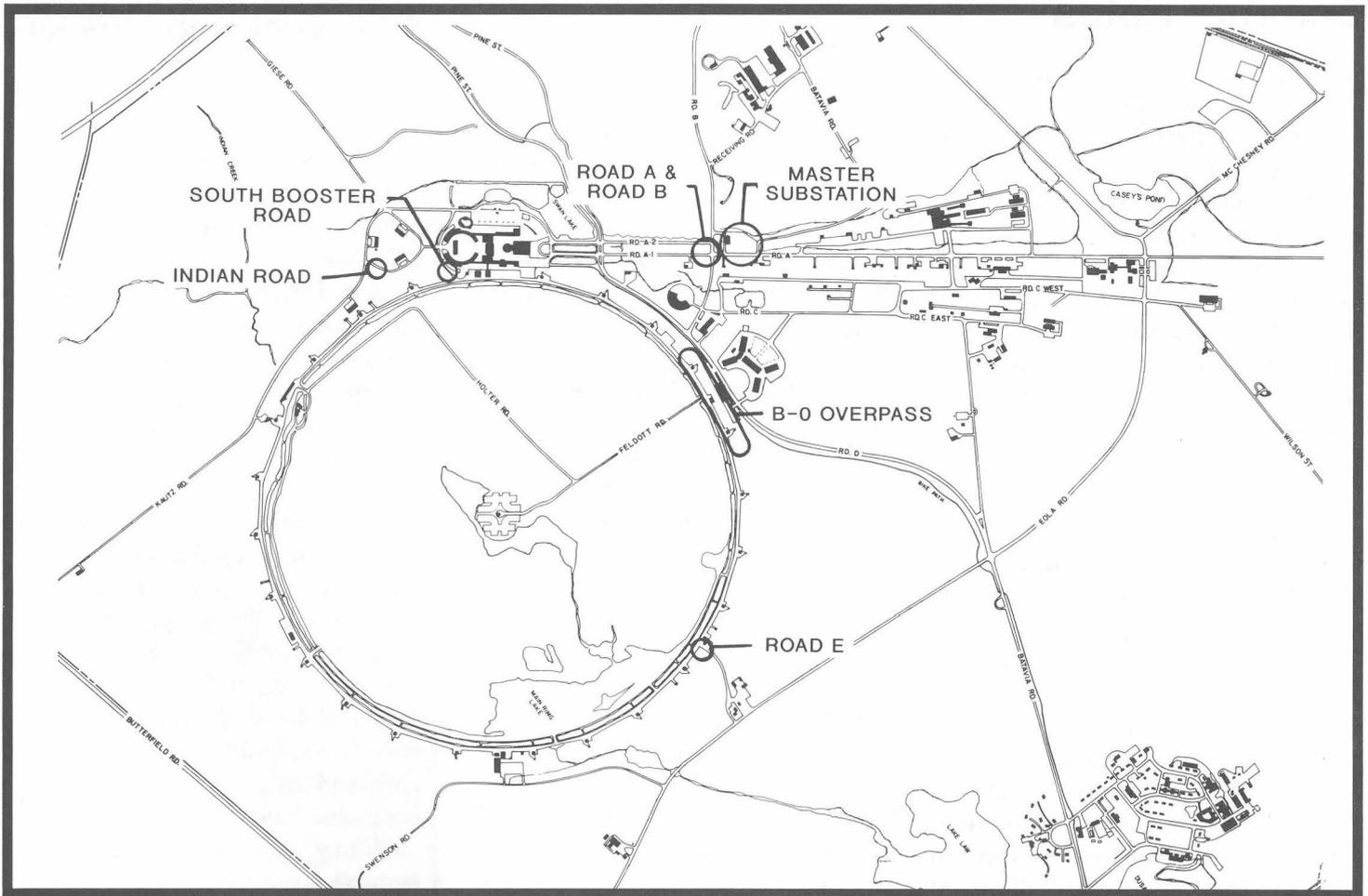
1. Additional buried steel plates. These are typically used where available distance between the beam line and above-ground grade requires higher density shielding than the normal dirt cover can provide.

2. Added earthen berm cover. Where enclosure design allows, this is the preferred shielding technique, especially where coverage is needed for large areas, such as along the primary beam transport lines.

3. Fencing installation. Four-foot high, posted fences which control personnel access are used to augment the earthen berm coverage. These are also used in areas where added shielding is difficult, such as at some enclosure entrances and penetrations for cabling and cryogenic lines.

4. Interlocked intensity monitoring. For primary beam lines which have relatively low beam intensity requirements, an efficient means of providing fail-safe protection against extended, full-machine intensity beam loss is the use of threshold intensity interlocks. This enables shutting down the beam line upon sensing a significantly higher than normal intensity beam pulse.

Upgrades continued on page 6



The above map, prepared by Kevin Clover (CES), shows locations of construction areas. During the evaluation process, the results of the shielding assessments are compared with the Fermilab Radiation Guide. Where additional thickness of earth, concrete or steel shielding is needed over underground structures, new structural calculations are done with the heavier loads. In situ soil strengths are measured so that the maximum soil capacity can be used for the structural calculations. Reinforcements or modifications to the concrete structures are designed to support the new shielding requirements. Where additional shielding is inappropriate, various fencing arrangements are also designed in accordance with Fermilab guidelines.

Shielding continued

documentation procedures. Documentation of the new shielding and fencing design will be brought together in a series of files and drawings that cover all the Fermilab accelerators and experimental areas. Each drawing covers a specific portion of the site and shows the criteria from the assessment and the required civil construction. Two approval sequences are included on each drawing, one verifying the design adequacy before construction and the second showing as-built shielding and fencing conditions. Future modification work, if required, will also be docu-

mented and approved on the same set of site-wide drawings.

New controls

The shielding evaluation with all appropriate references for each beam line or area along with as-built drawings will form the final documentation package. The official copy will be kept by the Construction Engineering Services Section and a second copy by the ES&H Section. In order to keep these records up to date, each Division/Section is responsible for maintaining the shielding in their geographical areas.

Any future proposed modifications along with the method of implementation, after Division/Section approval, must be forwarded to the Senior Safety Officer for approval and to Construction Engineering Services Section who will prepare drawings and subsequently revise the as-built drawings.

Computer aided drawings play role

Recent aerial survey mapping of the Laboratory site has been done in digital formats that allow for rapid

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Benefits notes

New Option - TIAA Transfer to CREF

Starting April 1, 1991, pension plan participants residing in Illinois, Washington D. C. and states surrounding the capitol can transfer all or part of their accumulation in a TIAA Retirement Annuity (RA) to CREF (RA). (Texas has not yet approved the transfer option.) Originally, only transfers from CREF to TIAA were allowed and funds in TIAA were locked in.

You can execute a TIAA(RA) transfer to CREF (RA) by calling TIAA (1-800-842-2733) to request application forms and returning the completed forms to TIAA. TIAA will then issue a TIAA Transfer Payout Annuity (TPA) for the amount of the transfer. You must transfer a minimum of \$10,000, and may transfer up to the total of your TIAA accumulation. Annual installments are then transferred over a ten-year period, in substantially equal payments comprised of principal, interest and dividends as declared.

Once a transfer has begun, you cannot revoke it or change the amount. However, if you have second thoughts, you can move the annually transferred sums back to TIAA. Funds will then earn the current interest rate for new premiums.

For detailed information, please consult your issue of the February 1991 *PARTICIPANT* (also available in Fermilab's Benefits Office) or call TIAA at the above mentioned number.

Please note that this article specifically refers to Retirement Annuities (RAs) not to be confused with TIAA-CREF Supplemental Retirement Annuities (SRA contracts) which have no restrictions on TIAA to CREF transfers other than those which may be imposed by state and/or federal regulations. —*Paula Cashin*

Shielding continued

direct preparation of computer aided drawings (CAD). Contour map plans are joined with profile drawings along the beam lines that show both surface and beam line elevations. Existing structures and beam pipes are located on these profiles and locations of additional shielding and fencing are added. After design approval, these drawings are issued to various construction contractors.

Start-up review

The ES&H Section will review all final shielding assessments and recommendations for modification or other improvements that will bring each area into compliance with the *Fermilab Radiation Guide*. The review of each beam line or area will start after receiving a documentation

package from the Research Division or the Accelerator Division assessment teams that include appropriate drawings as well as a comprehensive inventory of the present shielding along with needed modifications. Before the high energy physics program can resume at the Laboratory, Don Cossairt, Laboratory Senior Safety Officer and head of the ES&H Section, must certify by signing for the Director that all final drawings and shielding configurations meet the appropriate safety criteria.

The shielding assessment and consequent upgrades are indicative of Fermilab's commitment to the preservation of the environment, and the health and safety of Laboratory employees and visitors.

CES shielding project status

Construction work is being accomplished in parallel with the assessment, design and review functions as each drawing segment of a beam line or accelerator is finalized. Present work underway includes hauling and placing earth shielding, burying steel shielding, installing new fences, reworking site drainage and modifying utilities.

Considerable construction has been apparent at the Road A and Road B intersection in the experimental area. The beam line to the Meson area runs under these roads and continues under the 345 kV Master Substation. Approximately four feet of additional shielding rock and earth have been added over this beam line. Also, extra shielding steel has been buried beneath Road B over the Neutrino beam line.

In addition, a new connection of Road A-2 south of Road B has been constructed. Much of this construction work is well underway and Road A and Road B will be open to traffic in early April. Final paving will be completed in May.

Road E to the Main Ring CØ service building has been fitted with fences and gates to close access during accelerator operations.

At South Booster Road, next to the Main Ring AØ service building, no gates are required.

Shielding steel is being placed over Indian Road leading to Kautz Road intersection in the Antiproton area.

A glimpse at China

A full-capacity crowd of over 800 people packed Ramsey auditorium Friday, March 15 to hear astrophysicist and Chinese dissident Fang LiZhi discuss the future of China.

Formerly the Vice President of the University of Science and Technology at Hefei, Fang was removed from his post in 1987 and expelled from the Communist Party for encouraging student demonstrations on campus in favor of democracy. Fang, a longtime proponent of the democratic movement in China, was thrust into the political limelight in 1989 for inspiring student protests that later led to bloodshed during the June 4 Tiananmen square massacre.

For their roles as nonparticipatory figureheads in the uprising, Fang and his wife, physicist Li Shuxian, were forced to seek sanctuary in the U.S. Embassy in Beijing for over one year with minimal outside contact. Finally allowed to leave China in the spring of 1990 by the Chinese government, Fang and his wife began their life of exile travelling first to England and later emigrating to the United States.

While involved in astrophysics research as a Director's visitor at the Institute for Advanced Study in Princeton, N.J., Fang visited Fermilab between March 10 and March 17 on a mission of scholarly exchange. His agenda during the week consisted mainly of informal meetings with Lab researchers, but like his public lecture Friday, even his small seminars and colloquiums drew large audiences. Friday evening during his only public address, Fang—a dynamic speaker and raconteur—blended his layman's view of politics with his multi-cultural wit much to the delight of an audience eager for an insider's peek at socioeconomic and political conditions in China.

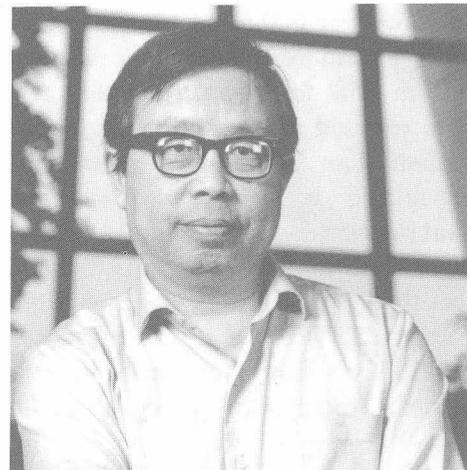
Admittedly not an expert on China's political future, Fang could only give what he called "an astrophysicist's point of view" on the events of the recent past and his vision of what lay ahead for the troubled country. "This topic is much more difficult than cosmology," Fang said.

Chinese culture is inherently unique, and differences in race, language and even food distinguish it from the rest of the world. Outwardly, the physical characteristics of denizens of Eastern and Western societies are dissimilar, but "human needs are basically the same," Fang said.

These external differences have contributed to China's history of isolation, but the tradition of striving to remain separate from the outside world has been breached in the last several centuries as technology has made the world a smaller place. Only through world trade and participation in the international community has China developed as a nation, Fang said, and one of the growing worldwide trends as of late is a move toward democracy. Chinese people want to modernize politics, the economy and their culture, but just how long it will take to enact all of these massive societal revisions is a question that remains to be answered.

"More countries have become democracies with respect for human rights," he said. "China also should go the same way. In the long term, China has no other choice but to allow freedom, democracy and respect for human rights."

While the history of the U.S. dates back a little over 200 years, Chinese history goes back at least 3,500 years, and change takes place slowly in China—unlike in the United States—



"The world will never forget the men and women of Tiananmen square who in 1989 paid with their lives for freedom in China," Fang said. "Their cause yesterday is still our cause today."

Fang joked. "In America, the time frame for change is very short," Fang said. "For example, you only like a 100-hour war."

In 17th century China, astronomers who did not share the Emperor's view of the known universe were put to death, and virtually all scientific exchange ceased until the middle of the 19th century after science and politics clashed in bloody battles over scientific theory and popular belief. Today, the same difference in opinion exists between the government and the Chinese people, but the problem has more to do with political reform, Fang said.

"The total time to adopt modern science in China was about 300 years, so I often use this example to encourage students not to lose their optimism," Fang said.

Pro-democracy uprisings are not new to China, Fang noted. Eight have taken place in this century alone, and Fang continued on page 6

Fang continued

in 1959 over 500,000 Chinese people suffered and were sent to labor camps, put on trial for treason or had their jobs revoked after an uprising more violent than Tiananmen square. Increasingly it is becoming evident that the worldwide communist system is in decline, and communists have lost their reputation in China as well, Fang said. "We can say with greater confidence that Communism will someday come to an end in China," he said.

Despite the military crackdown that forced the pro-democracy movement underground, the fight for human rights still goes on in China, although pro-democracy supporters have had to implement a more high-tech approach to their campaign in the wake of the renewed repression.

Tongue in cheek, Fang said unknown members of the pro-democracy movement implanted a "virus" in the computers used to manage the 1990 Asia Games held in Beijing. When users logged onto a computer with their password, "The screen showed a statement that asked 'Is the Prime Minister a killer?'"

"If you answered 'no,' then the computer shut down. If you answered 'yes,' the computer let you continue," Fang said.

But to Fang, the sentiment among most of China's population truly reflects this bit of anecdotal fiction. Because China is controlled by an older generation of leaders, however, change will come slowly, and only after China has reformed a number of long-standing industrial, social and institutional problems.

In comparison to developments taking place elsewhere in the world,

China's social progress will be hindered by the fact that it is still a poor and developing country. Its per capita gross national product totaled only \$310 per person in 1982 dollars, Fang said. Additionally, China's geographical size and population density make it a leading contributor to the global pollution crisis. As an example, 1987 figures show that China produced a disproportionately high eight percent of the airborne pollutants emitted in the world.

Educating the Chinese public will also play a large part in setting the wheels of change in motion. An unimaginable number of its 1,133,682,501 citizens cannot read or write, but in spite of this handicap "Chinese people still seek the same kind of progress...sought by people everywhere," Fang said.

The Tiananmen square massacre showed that students and other people wanted to change China's system of government, Fang said. While many people in the United States may know of the gulags (labor camps) in the Soviet Union, it took the protestations and deaths of thousands of Chinese in 1989 to turn world attention to China.

"They wanted more democracy because the Communist regime had failed them economically, and because the regime always punished and trampled them," he said.

Looking ahead to the future, Fang predicted that no one "superman" will be able to replace the current Chinese Communist Party Chairman after he dies and rule with the same authority, so the central government will ultimately become weak.

"After the older generation passes, China will change, but I do not think

China will immediately change to a democratic system because it still has some difficulties ahead," Fang said. "It's clear that the struggle for human rights is far from over."

Calling for an end to the repression that has stifled the fight for human rights in China, Fang concluded his lecture by asking for unity and commitment from every member of the world population to support China's quest for political freedom. While the road to freedom has been long and difficult and will remain so for many years to come, it will undeniably lead to democracy and human rights, Fang concluded.

"The world will never forget the men and women of Tiananmen square who in 1989 paid with their lives for freedom in China," Fang said. "Their cause yesterday is still our cause today."

"It is a dream that shall never die. This is the future of China." —*Brian Dick*

Upgrades continued

5. Interlocked radiation detectors. Interlocked radiation detectors (chipmunks and scarecrows) are utilized in most of the experimental beam areas. These monitors also trigger the critical device safety system, which removes the radiation source when radiation levels greater than a preset threshold are seen. Typically, interlocked detectors are used in experimental halls and counting rooms, where people generally work.

National safety council-HazCom training

Attention: All Fermilab Employees

The National safety council will be on site during the period from April 29 to May 7 to train personnel in Hazard Communication. **The training is mandatory for all employees.** All sessions will take place in the Ramsey auditorium.

Each session outlines the OSHA Hazard Communication Standard, use

of material safety data sheets, methods of detecting dangerous chemicals, means of protection from hazards and other chemical safety topics.

The two-hour class will be offered 10 times over the two-week period. If possible, please attend the class corresponding to the last two digits of your ID number:

Number	Date	Time
00-12	Monday, April 29	9:00 a.m.
13-25	Monday, April 29	1:30 p.m.
26-37	Tuesday, April 30	9:00 a.m.
38-50	Tuesday, April 30	1:30 p.m.
51-62	Wednesday, May 1	9:00 a.m.
63-75	Wednesday, May 1	1:00 p.m.
76-87	Monday, May 6	1:30 p.m.
Makeup	Monday, May 6	4:30 p.m.
88-99	Tuesday, May 7	9:00 a.m.
Makeup	Tuesday, May 7	1:00 p.m.

The make-up sessions are offered to those unable to attend their scheduled session. Questions should be directed to Joe Kenny at x3810 or Cathy Turner at x4437.

International film society features

Friday, April 12 at 8:00 p.m.

Lawrence of Arabia

Based on the true story of British officer, T.E. Lawrence, this winner of 7 Oscars is an unforgettable epic set in the expanse of the Arabian desert. David Lean, director, G.B., 1962, (202 minutes)

Admission is \$2. Films are presented in Ramsey auditorium.

Friday, April 26 at 8:00 p.m.

The Sheltering Sky

A wealthy, but unhappy American couple makes an extended trip through Africa. Stars Debra Winger and John Malkovich. Novel by Paul Bowles. B. Bertolucci, director, U.S., 1990, (137 minutes)

Road closings

Beginning Monday, April 1, weekly updates regarding construction-related road closings will be announced on *Video News* on Channel 9.

Harper's index

Percentage change, since 1989, in the number of debutantes at the New York Debutante Christmas Ball: -46

Average age at which an American develops a phobia: 13.5

In memoriam



Charles Kaliher
1951—1991

Charles "Chip" Kaliher (CD/Central Computing) passed away Saturday, March 23, at St. Francis Hospital in Evanston, Illinois. He had been a patient for about a week.

Chip began his career at Fermilab in July 1985. For the last three years, he has headed the advanced computing production systems, known to many employees as the "farm computing system."

In recognition of Chip's contribution, the Computing Division has announced that its new, high-powered parallel computer will be named the Chip Kaliher Parallel Processing Farm. It will be installed in May.

Chip was described by supervisor Gerry Bellendir (CD/Central Computing) as "extremely diligent, hard-working and highly motivated." As a group leader, he was "always there when he was needed," continued Gerry.

Chip is survived by a son Karl, age 11 and a daughter Kelly, age 9.

The family would prefer that any contributions in Chip's memory be made to the Association for Brain Tumor Research in Chicago. Laboratory personnel who wish to contribute may contact Pat Mascione, WH8X, MS 120 or Mari Mendez, FCC3W, MS 369. Checks should be made payable to the "Association for Brain Tumor Research" or "AFBTR."

Cla\$\$ified ad\$

Motorized vehicles:

1951 Ford F-100 Pickup, grain box (tool), flathead 6 cyl, stick shft. \$600. Call Mike x3420 or 708-931-4193.

1978 Buick Regal, 2-dr., V8-305, good cond., asking \$600. Call Lou at x3343 or 708-653-4336 evenings.

1979 Olds Cutlass Supreme Brougham, silver, 2-dr., auto-tran., pow. str., pow. br., A/C, good cond., new exhst., asking \$1,400. Call Joy at x3111 days or 708-859-3671 after 5 p.m. and weekends.

1979 Olds Delta 88, 2-dr., runs good, good tires and interior, AM/FM, A/C. Best offer. Call Mike, page 418 or 708-978-7018 after 5 p.m.

1980 Mazda GLC, gold, good cond., new exhst., only 81k mi., asking \$1,200. Call Anna x2409 or 708-357-6271.

1982 Toyota Tercel, silver, 4-dr., 5-spd., good body, new brakes, AM/FM. \$950 o.b.o. Call Li x2835 or Qian x4855 evenings.

1983 Toyota Tercel, 4-dr. htchbk, 5-spd. man., 59k mi., A/C, AM/FM, reliable, asking \$1,400. Call Tom x4458.

1983 Nissan Sentra, beige, 4-dr., 5-spd., new clutch, new exhst. pipe, pow. str., 9k mi., AM/FM. \$1,250 o.b.o. Call Bai at x2835 or x4928 evenings.

1986 Corvette Coupe, auto-tran., Z51 susp., leather uphol., 2 roofs, Alpine AM/FM/CD, unique 2-tone silver/black. Exc. cond. Looks and runs great, \$14,000. Call Steve 708-690-0282 or Laura x3096.

1987 Pontiac Bonneville, pow. str, pow. br., pow. win., pow. seats, pow. door, cruise, AM/AM/cass., A/C, 119k mi., orig. owner, runs great. \$3,000. Call 708-879-5896 after 6 p.m.

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Miscellaneous:

Free Spirit 10-spd. bike, mens, \$95. Call Jim x2263 or 708-584-6698 after 5 p.m.

Schwinn Continental 10-spd. bike, mens, \$90. Call Jim x2263 or 708-584-6698 after 5 p.m.

Wood burning hot water heater, \$85 o.b.o. Call Jim x2263 or 708-584-6698 after 5 p.m.

Evinrude outboard with tank. Runs. \$100 firm. Call Mike x3420 or 708-931-4193. Will trade firearms.

Moving/Garage sale. I am moving to Knoxville, TN - everything must sell - April 18, 19, & 20; 716 Illinois Ave., Batavia (off Rt. 31). King-size bedroom set, lawn mower, many misc. items for sale, for further info. call 708-879-0602 after 6 p.m.

House for sale - 719 Second Ave., Aurora, \$76,900. 7 rms., 3 bdrms., hrdwd. flrs., 1 1/2 baths, 2 car det. gar., al. siding, full base., city swr. & wtr., gas heat and water htr. Newer therm. energy eff. windows, new copper plmb., newer roof. Lot size 64 x 167, appl. incl., big fenced back yd. w/apple tree, 2 maples and gardn. Jungle-gym set incl. House Masters inspection warranty. Call David at x4533 or 708-851-0763 or Fair Realtors at 708-859-1200.

Electric clothes dryer, exc. cond., \$75. Call x4597 or 708-983-0279 evenings.

Wanted:

Roy Jeffries (CD) and his dog Cody are currently seeking transportation to work at Fermilab and home again on Tuesdays and Fridays. Home add. is 370 Spruce St., Aurora. If you can be of assistance, contact Roy at x3146/4270 or 708-896-7393.

A copy of *Probability and Statistics in Particle Physics* by Froedesen, Tofte and Skjeggstad. Will buy. Contact John Hissong x4149/T755, FNAL::Hissong.

Fermilab dart club

A Fermilab dart club is being organized for all interested employees, users and retirees. The club is open to experienced, beginner and have-never-done-it darters. The goal of the club is to organize a league consisting of 3-member teams, and play a schedule of matches between teams.

The games that will be played are: Double In/Double Out 301, Double Out 501 and Cricket. Matches will be played in the User's Center TV room.

The main goal of the club is to introduce people to the sport of darts and to have FUN competing. Anyone with questions or the desire to get involved may contact Wayne Johnson x3190, Jim Loskot x3355/3632 or Buzz Rodewalt x3355.

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The deadline for the Friday, April 19 *FermiNews* is Wednesday, April 10. Please send your article submissions or ideas to the Publications Office.