Reflections

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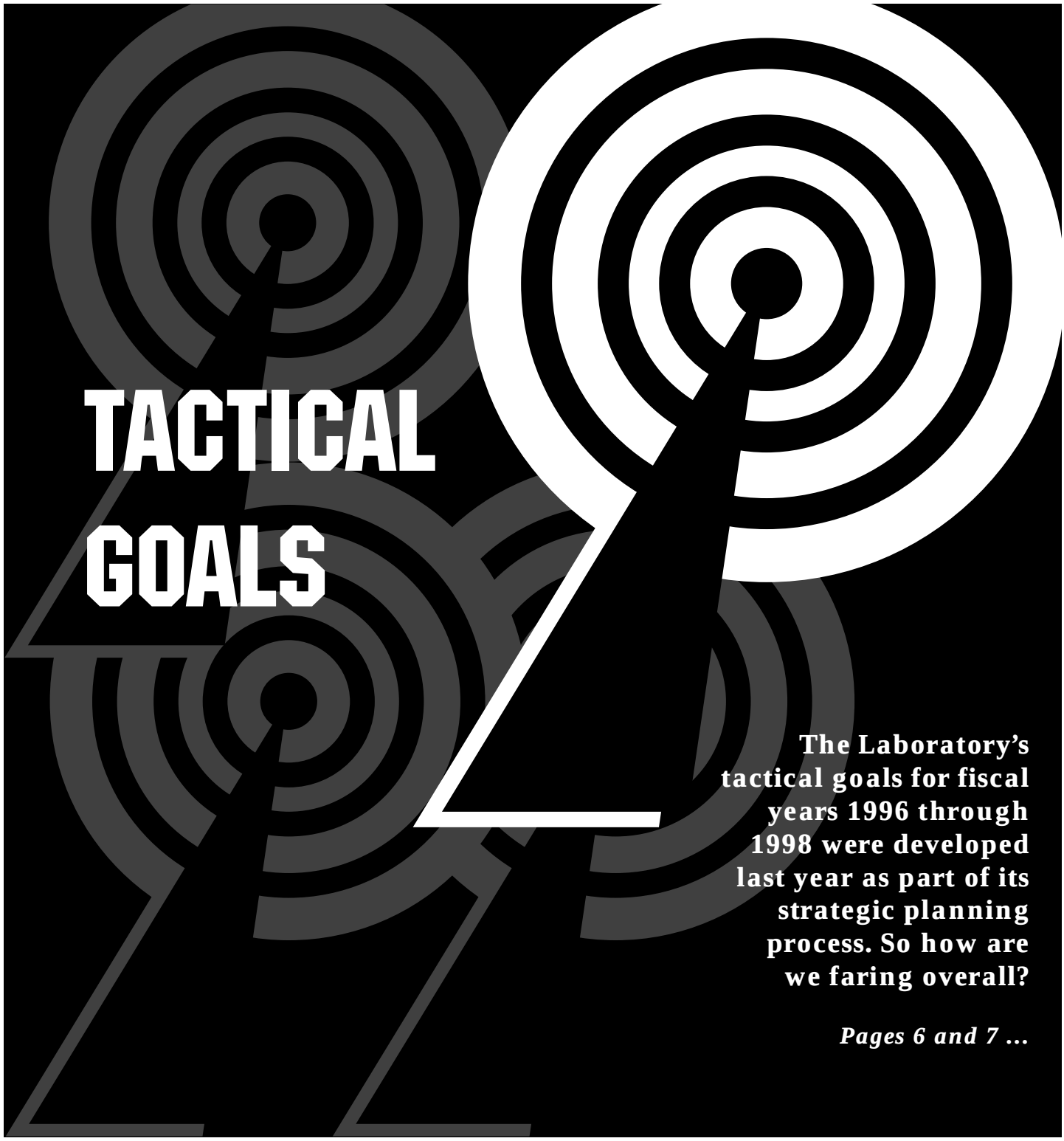

TACTICAL GOALS

The Laboratory's tactical goals for fiscal years 1996 through 1998 were developed last year as part of its strategic planning process. So how are we faring overall?

Pages 6 and 7 ...

Inside this issue ...

Cover illustration by Edwin Vigil

Reflections

Reflections, the Laboratory monthly publication for employees and retirees, is published by Public Information (PA-1). The staff is located at TA-3, Building 100, and can be reached by e-mail at *newsbulletin@lanl.gov,* by telephone at 7-6103, by fax at 5-5552 or by regular Lab mail at Mail Stop C318. The individual telephone numbers are listed below.

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editor's journal

So whaddya think?

It's been six months since the first issue of "Reflections" was published, and to paraphrase a former New York City mayor, "How're we doin'?"

We've tried to find interesting and informative material to put in the publication each month, and we've enjoyed the challenge (check out the Lab-related trivia quiz, "Brainteasers" on Page 11). But sometimes you can't see the forest for the trees, smoke gets in your eyes, you need to stop and smell the coffee, step back and ... well, you get the idea. That's why I'm soliciting comment from readers this month.

I really want to know what you like or don't like about the "Reflections" content and why. For instance, what features or columns would you eliminate or improve? And if you have story ideas that fit into the "Reflections" format, we'd love to hear about them.

Over the past few months I've heard from a few employees. Many have applauded the publication and offered useful suggestions for making it even better; others have taken exception with some of the content but like the overall format; still others have panned it as a "glitzy" waste of money that no one reads or likes.

But what do you think?

I'm not promising that we will do everything that is suggested — like everyone else, we have limited time, resources and money. But we certainly will take all comments under serious consideration. We realize we never will please everyone, but we want "Reflections" to be something you look forward to reading each month.

I ask only one thing: Please don't write just to tell me "Reflections" is not the old Newsbulletin — I already know that.

"Reflections" is not meant to be a vehicle for timely or "newsy" items (that's the role of the electronic Daily Newsbulletin). "Reflections" is a publication through which Lab employees and retirees can share the successes and interests of present and former co-workers, learn about programs or organizations around the Lab and, yes, feel good about some of the positive things going on around here. We've also included some humor and educational material to share with family and friends.

Send comments to *newsbulletin@lanl.gov* via e-mail or mail them to "Reflections" at Mail Stop C177.

And one more thing. Don't forget to check out the Daily Newsbulletin at http://www.lanl.gov/Internal/News/dailynews.html on the Web. That's where the "newsy" stuff is. You even may want to do as I and others at the Lab have done: Make the Daily Newsbulletin your "home page," so it's the first thing to come up when you log on to the Web each day (you can arrange this under preferences in your browser software). You don't have access to a computer? Ask someone in your organization's office to print you out a copy.

Native American Heritage Month

Students find role models through tutoring program

by Steve Sandoval

Good role models for kids are hard to find. Some 350 students at Santa Clara Pueblo have found some at the Laboratory through a tutoring program involving Lab employees.

For the past 10 years, Lab employees have made twice or three-times-a-week trips down the hill to tutor kindergarten through 12th grade students at Santa Clara in subjects ranging from English and math to reading and spelling.

According to Paula Tsoodle, learn and serve coordinator for the pueblo, the students and the Lab are benefitting. "The pueblo is very happy with the program," said Tsoodle, noting that 39 students are being tutored this school year.

"I believe the relationship between the Lab and the tribe is like an open door where when we have a need we can go to the Lab," Tsoodle said.

In turn, she said, "I hope this program will give Lab employees hands-on experience to the world of Native Americans. In order to get to know people of another culture you need to interact with them on a regular basis. I believe this program helps people from Los Alamos understand that Native Americans are here, we're thriving, we're getting more educated. We're going to be here for a long time.

"I hope the example they are leaving with our young people will lead [our students] into careers in math and science and maybe even lead them up to the Lab."

The tutoring program was started after many parents at the pueblo found they couldn't help their children with their homework, said Tsoodle.

Laura Wolfsberg of Environmental Science and Waste Technology (CST-7) said she became a tutor to "try to help out the students at the pueblo and give them a little flavor of science.

"Maybe seeing a woman working in science would encourage them to consider pursuing a career in science," Wolfsberg said.

Wolfsberg tutors a fifth-grade girl in reading and spelling. "I think a lot of times what happens to kids is that teachers are so busy they don't have a lot of time to spend one-on-one with students. That's where the tutoring helps," she continued.

Andy Wolfsberg of Geoanalysis (EES-5), Laura Wolfsberg's husband, tutors two high school students at Santa Clara Pueblo. "It's definitely been a good experience for me," he said. "I think it's been a good experience for the students. The students have a lot of influences in their life right now, and as tutors we are helping them focus on their academic priorities. And we generate enthusiastic students who may come work here."

Activities scheduled through April

by Steve Sandoval

Displays depicting Native American-Laboratory relations, youth dancers and several speakers are part of Native American Heritage Month activities scheduled this month at the Lab.

Activities kick off April 7 with a reception featuring Native American youth group dancers beginning at 4 p.m. in the Santa Clara Gallery on the second floor of the J. Robert Oppenheimer Study Center, said Barbara Grimes of the Community Involvement and Outreach (CIO) Office.

All that week, arts and crafts made by Native American Lab employees will be displayed in the Santa Clara Gallery.

Grimes is the Lab's American Indian education outreach coordinator and worked with the Lab's Native American Diversity Working Group to develop and sponsor the activities.

"It is important that we share with Lab employees the heritage of the Native American people," she said. "These activities will give our employees a better understanding of Native American culture, history and major issues Indian people face today."

"I think heritage months in general, for every group, are good ideas because they give people a chance to share in other people's backgrounds and experience their ethnic experiences," said Native American Diversity Working Group chairman Miles Baron of Astrophysics and Radiation Measurements (NIS-2).

Baron credited Laboratory Director Sig Hecker with forwarding the Lab's efforts at improving diversity. He added that the group feels that commitment from upper level management to improve diversity of the workforce is important.

Baron said the Native American Diversity Working Group supports Grimes in improving career development opportunities and attracting Native American students to the Lab, which contributes to the Lab's overall diversity efforts.

Scheduled speakers during the month include Robert Whitman, assistant professor in the department of electrical and computer engineering at the University of New Mexico and a Navajo Indian; Michele Arviso Devlin, a news reporter for KOAT Channel 7 in Albuquerque and also a Navajo; author and historian Joe Sando of Jemez Pueblo; and retired engineer Kenneth Ahmie of Laguna Acoma. Tim Giago, president and publisher of Indian Country Today, was tentatively scheduled to speak.

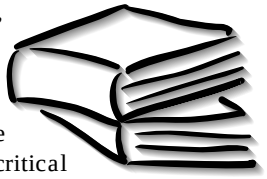
Other scheduled activities include a poster session the week of April 14 through 18 in the Santa Clara Gallery in the Study Center; a monthlong display in the Otowi Building of activities and projects involving the Lab and nearby pueblos; and the Cochiti Pueblo Headstart dance group in the Otowi Building outside patio on April 17.

Helping students and teachers

This report was prepared by Dennis Gill, Dolores Jacobs and Abad Sandoval of Science and Technology Base (STB) Programs. If your organization wishes to report on its activities, please call us.

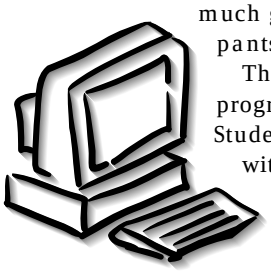
Have you ever wondered why the Laboratory conducts science education programs? The answer is simple. We believe we have something unique to offer in education, and that in the long run this will benefit the Laboratory and the Department of Energy. Students and teachers placed in direct contact with research scientists and research programs learn about science, math, engineering and technology, and how they are actually done, as well as learn about the Laboratory and its programs. A carefully designed teacher development program produces better teachers, and the student programs encourage students to become more interested in science. We are using the word "science" here to mean "science, math, engineering and technology."

'Our goal is not to make a scientist out of every student. Rather, our goal is for every student to have some knowledge and understanding of science, especially critical thinking skills ...'



Our goal is not to make a scientist out of every student. Rather, our goal is for every student to have some knowledge and understanding of science, especially critical thinking skills, so that he or she can be a more effective decision-maker and a better informed citizen. We also hope that some students will return to the Lab. Many of the education programs concentrate on developing a pipeline of qualified potential employees from the local area. Last year, 91 percent of the participants were from New Mexico and 61 percent were from Northern New Mexico.

The Laboratory conducts two dozen science education programs at all grade levels. They include teacher development workshops, student participation programs, technology applications to education, curriculum development, public awareness of science programs, research internships and seminars by world-class scientists. These programs, sponsored by the Education Program Office and funded directly by DOE/Defense Programs, are conducted by 10 different groups in eight divisions. Last year these programs reached 2,387 direct participants, but the secondary impact was much greater since many of the participants were teachers.



The undergraduate and graduate programs emphasize research internships. Students spend most of their time working with Laboratory scientists on research projects and a few hours per week on educational and professional development efforts. The college-level programs also encourage the participation of faculty. For example, last year the Two-Year Colleges Initiative organized and held a workshop on advanced manufacturing techniques for regional two-year college faculty. The purpose of this workshop was to improve the colleges' ability to teach in this area of technology, which is important to the Laboratory. The Historically Black Colleges and Universities program brings students and faculty to the Laboratory for research internships.

The K-12 education programs emphasize teacher development, the use of technology in the educational process, problem-solving and critical thinking skills. For example, the Critical Issues Forum introduces high school students (and teachers) to the use of critical thinking skills in developing solutions to complex technical and political problems. CIF also makes extensive use of technology in the form of an interactive World Wide Web page for communication between the various high school teams and the Laboratory. The Teacher Opportunities to Promote Science program works with middle school science teachers statewide to develop better methods of teaching science and math. Over the past five years more than 150 teachers have been through the three-year TOPS program.

The Laboratory actively helps schools, school districts and two-year colleges in Northern New Mexico design and set up computer networks and connect to the Internet. The Educational Networking Support Program (EduNets) holds workshops for teachers to help them learn how to use these new technological tools and how to integrate them into their teaching practices. EduNets is currently working with 22 Northern New Mexico school districts, eight community colleges and seven other organizations, including the New Mexico Department of Education.

The Laboratory can be proud of its science education programs. They are helping regional schools to improve the overall quality of science education and encouraging more local students to study science. The recent consolidation of the Science Education Office (HR-SEO) into Science and Technology Base Programs will provide better coordination between many of the science education programs. More details about all the programs can be found on our Web page on the Internet at http://education.lanl.gov, and additional information can be obtained from the Education Program Office at 7-8680.

TA-55 safety study earns headquarters approval

by John A. Webster

An intensive two-year effort that involved most of the staff at the Plutonium Facility and produced documents nearly 9 inches thick ended successfully with Department of Energy approval of the final Safety Analysis Report for Technical Area 55.

The approval by Victor Reis, DOE assistant secretary for defense programs, marked the first SAR in the DOE complex to be completed under the new SAR requirements and approved at the Headquarters level, said Derek Gordon of Facilities Management (NMT-8), the project leader.

"We got geared up for this effort in July of 1994," Gordon said. "We were on a tight schedule to get it completed and delivered within one year. It was very intense with a lot of people involved.

"The primary authors (of the 17 chapters in the main document) interacted with people across TA-55. Really, the whole site was involved to make sure we had all the facts straight."

After the draft was completed, the SAR was extensively reviewed by a Laboratory board and then submitted to DOE. Three months later, DOE returned it with numerous comments, beginning a lengthy revision and negotiation period that ended in August 1996, when the final documents were submitted to DOE. Approval came last Jan. 13.

A safety analysis for a nuclear facility, required under the provisions of DOE Orders 5480.23 and 5480.22, is a documented process to identify all the hazards within the facility; describe and analyze the adequacy of steps taken to control, eliminate or mitigate these hazards; and analyze and evaluate potential accidents and their associated risks.

"It defines how our chemical, metallurgical and ceramic processes will work; how our safety systems are designed, operated and maintained; and how the structures here are designed," Gordon said. "It's sort of like a 'license' between TA-55 and the DOE on how we will operate the facility," he said. "We 'apply' for the license by submitting the SAR, and the DOE grants us the 'license' to operate the facility with its approval. Without such approval, we could be shut down or our activities restricted."

The SAR fills a 6-inch binder and is accompanied by two other documents — a set of Technical Safety Requirements that outlines specific requirements defining safe operating conditions and management controls, and a Hazard Analysis that provides more detail about potential hazards.

Gordon said the transition to the new safety requirements will take a year. Some equipment will be upgraded, he said, and the SAR itself will require annual updating.

When the news of Headquarters approval reached the project team, its members decided to go to downtown Los Alamos for a "lessons-learned" lunch, Gordon said.

"The primary lesson we learned was that we don't want to have to do this again."

Two employees of TA-55's Plutonium Facility (left and center) remove material from a glovebox in what's called a bagout procedure while a radiation control technician monitors the procedure for contamination. *File photo*

Author! Author!

The primary authors of the 17 chapters in the Final Safety Analysis Report for Technical Area 55 that was approved by the Department of Energy are Ron Selvage, Mark Devolder, Dan Pappas, Jim O'Neil, Ross Urie and Scott Dick, all of Facilities Management (NMT-8); Larry Goen and Kin Lam, both of Engineering Analysis (ESA-EA); Bill Schueler and Laura Jarvinen, both of Waste Management and Environmental Control (NMT-7); Jerry Morzinksi of Technology Modeling and Analysis (TSA-7); Terri Rudell of Facility Risk Management (ESH-3); Stuart Vessard of Nuclear Criticality Safety (ESH-6); Paul Hoover of Health Physics Operations (ESH-1); Dina Sassone of Industrial Hygiene and Safety (ESH-5); Ray Tell of Fire Protection (FSS-21); and contractors Craig Frederickson and Bill Kennedy.

Other sites, other SARs ...

Safety Analysis Reports for nuclear facilities are approved by different levels of the Department of Energy, depending on the level of potential risk to workers and the public. According to Facility Risk Management (ESH-3), which tracks the status of the Laboratory's SARs for nuclear facilities, the CMR Building is the only facility beside Technical Area 55 requiring Headquarters approval. Its SAR was under DOE review as of March 7.

The SARs for the Laboratory's other facilities require approval by the Albuquerque Operations Office. Those which have been approved by Albuquerque are the Los Alamos Critical Experiments Facility at TA-18; the Radioactive Liquid Waste Facility and the Waste Characterization, Reduction and Repackaging Facility, both at TA-50; and the Transuranic Waste Storage Facility and Transuranic Waste Inspection, Storage and Retrieval Project, both at TA-54.

Facilities whose SARs are under review at Albuquerque, as of March 7, are the Weapons Engineering Test Facility at TA-16; the Tritium Systems Test Facility and the Tritium Science and Fabrication Facility, both at TA-21; and the Radioactive Materials, Research, Operations and Demonstration Facility at TA-50.

Tactical goals — How we're doing

Last summer, the Laboratory embarked on a second round of tactical goals. Seven programmatic and four operational goals were adopted and published in the pamphlet titled "Tactical Plan FY 96-98." These goals, which focus on programs requiring a near-term, institutional emphasis, evolved from previous tactical goals, with improvements focusing on increased value of Lab products and services to its customers and a longer period in which to accomplish the goals.

The following material highlights some of the progress made with many of the tactical goals. The information was collected by the Quality and Planning (QP) Program Office through interviews with the respective tactical goal champions or their representatives.

Because of the amount of material, only seven tactical goals are covered in this month's "Reflections." The remaining four goals, Productivity and Strategic Business Development; Integrated Environmental Science; Modeling, Simulation and High-performance Computing; and the Genome and Beyond, will be covered in a future issue. A full up-to-date description of progress is available at http://www.lanl.gov/subject/planning on the World Wide Web, or call 7-9770. Please send your comments, questions or suggestions to *LabPlan@lanl.gov* by electronic mail.

Safety First

Champion: Sig Hecker

• The Lab adopted and currently is implementing the Integrated Safety Management Plan as its safety management program. ISM moves the Lab away from a compliance-based culture to one based on performance standards that are set cooperatively between the workforce and DOE.

• A program manager for ISM was appointed in the Director's Office, with resources allocated for program development and implementation.

• A safety awareness communication program is being drafted.

• Four focus groups have been formed that will create standards to enhance workplace safety in the following areas: worker health and safety, environmental protection, emergency preparedness and management, and facilities.

• A safety accountability matrix is being implemented.

• Site hazard analysis procedures for facility managers were completed last December.

• An institutional work control process for facility-related work was completed last December and implemented last month.

Embrace Diversity

Acting Champion: Mick Trujillo

• Thus far, the Lab has met only about 18 percent of the 1996 affirmative action goals for women and about 16 percent of the 1996 affirmative action goals for minorities. Action-oriented plans have been developed for unmet goals for each division.

• The Laboratory has re-engineered its recruiting program and a strong link has been established with professional organizations for minorities.

• A new Career Development, Mentoring and Succession Planning Program designed by a Laboratory Leadership Council team is being developed by the Human Resources (HR) Division. An Executive Steering Committee is overseeing development.

• An LLC-level Student Issues Team completed a study of student programs, and recommendations were presented to the LLC.

• A Diversity External Advisory Council was formed in 1996. It meets on a quarterly basis.

• A Diversity Council and five Diversity Working Groups have been formed and advise Lab management on diversity issues.

• For diversity overall, the Lab "meets expectations," as defined in Appendix F of the University of California contract.

Corporate Citizenship

Champion: Leroy Apodaca

• The University of California established a local office last fall. It houses a response database for all Lab-related inquires.

• The Lab is formally establishing a nonprofit foundation to raise scholarship funds for Northern New Mexico students; local businesses are helping support the foundation.

• The Good Neighbor Program has been established to increase dialogue between the Lab and surrounding communities.

• A new organization composed of Lab subcontractors, called the Association of Corporate Members, recently was formed to help coordinate regional economic development initiatives.

• UC contract negotiations include the addition of a new Appendix (N) to focus attention on regional initiatives.

• The Lab received an "exceeds expectations" (88 percent) rating in the 1996 Appendix F category of trust performance.

• The Lab met its target for corporate citizenship on the 1996 DOE Quality Award Application (Baldrige Category 1.3).

Science-Based Stockpile Stewardship and Management

Champions: Steve Younger and Paul Cunningham

• Construction on the Dual Axis Radiographic Hydrodynamic Test facility has resumed; DARHT-1 operations are scheduled to begin in June 1999.

• The Lab is working with Sandia and Lawrence Livermore national laboratories on a strategy for constructing an advanced hydrotest facility.

• The Computing, Information and Communication (CIC) and Applied Theoretical Physics (X) divisions are working together on three-dimensional, Accelerated Strategic Computing Initiative MPP code implementation.

• The Pulsed High-energy Radiographic Machine Emitting X-rays set a world record for "dose on target."

• The pulse-power machine Pegasus has successfully performed high-precision ejecta experiments.

• In the area of surveillance, stockpile detonators were evaluated at Los Alamos; the Lab exceeded its goal for pit surveillance units.

• The best calculation of three-dimensional proton radiography ever done was performed.

• Pantex was presented the initial baseline criteria for requalifying pits.

• Industrial partners were established for five technology areas in integrated manufacturing.

• In fiscal year 1996, the Lab completed the conceptual design report for a 50-pit-per-year module for use here. This design will continue to evolve.

• Mature surveillance technologies are being implemented, including air bearing tests at the Lab, Pantex and Y-12. Modal vibration tests are being implemented here and at Y-12.

• Enhanced surveillance technologies currently in the development process include TV laser holography and the Polymeric Materials Aging Program.

The Neutron Laboratory

Champion: John Browne

• Los Alamos has been given the national leadership role in DOE's Accelerator Production of Tritium Program. As a result, its budget has been increased from $85 million to $118 million.

• An external review committee gave the Lab's APT program a "good" rating last fall.

• User availability of the Los Alamos Neutron Science Center exceeded the 80 percent target set for facility operation.

• In a survey taken last August, LANSCE users expressed satisfaction with facility performance in all but one area. Additional resources have been allocated to address this problem.

• The Lab has been allocated $42 million over five years by DOE for a major upgrade of the Short-pulse Spallation Source at LANSCE.

• Planned target dates for the Long-pulse Spallation Source have been pushed out by one year in order to respond to an announced DOE/Defense Programs complex-wide study on new facility initiatives.

• In the area of Advanced Transmutation of Wastes, the Lab has been successful in establishing strong international connections. Arrangements are being made to test a Russian-built liquid lead target at LANSCE, beginning in 1999.

• DOE is supportive of, and is likely to fund, a new facility here for medical radioisotopes

The Plutonium Future

Champions: Paul Cunningham and Don Cobb

• The Global Nuclear Vision Project is on target with Institutional Program Development funding. Strong national and international connections have been formed for planning the future of nuclear energy and materials.

• Major program growth (a $35 million increase) has occurred in nuclear materials control and accountability collaborations with Russian research facilities and institutions. As a result, more than 40 sites have much better nuclear materials protection. Discussions are under way for a agreement with a Russian production site to better protect its nuclear materials.

• The Lab has implemented plutonium safeguard technologies and practices upgrades. Additional sites to implement these technologies and practices have not yet been identified.

• Much of the "legacy plutonium" at Los Alamos has been repackaged; the Lab is advising Rocky Flats on its situation.

• The Lab has had limited progress in obtaining increased programmatic funding for basic science (customer emphasis is on short-term projects). However, the Environmental Management Science Program awarded to Los Alamos researchers $8 million for basic research.

• Los Alamos chairs the Technical Advisory Panel for Plutonium Focus Area.

• A Los Alamos branch of the Seaborg Institute has been approved. The search for a director is under way.

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Dancing coyote is 'Best of Show'

Wildlife technician Rhonda Robinson of Ecology (ESH-20) recently received a "Best of Show" for her photo entry during the Feb. 7 joint Arizona/New Mexico meeting of the Wildlife Society in Gallup. The photo also received first place in the mammals category.

"My colleagues and I routinely carry cameras when we're out in the field and take pictures of animals for our records," said Robinson, who helps keep track of small, medium and large-sized animals around the Lab site, including rodents, foxes, bobcats and elk. Her responsibilities include assisting researchers in studying elk ecology and testing animals for diseases.

Rhonda Robinson

The untitled winning photo (above) showed a coyote dancing in the snow around the Valle Grande area in December 1995. Robinson, who has been at the Laboratory a little more than two years, and other colleagues were in that area locating radio-collared elk at the time. "I snapped about 14 photos of him. He was dancing, sitting, standing — he was very photogenic and very cooperative," she joked.

"Sometimes we forget to take our cameras with us, and we end up missing great photo opportunities," she added. "I'm just glad I had mine with me that day."

This is the first time Robinson had ever entered her photos in any contest. "I had the photo hanging in my office, and I just decided to enter it in the contest," she said.

Three ESA-EA employees recognized by DOE for work on TEAM program

Wilbur Birchler, Robert Meier and Dan Weinacht of Engineering Analysis (ESA-EA) were recognized by the Department of Energy for their work on the Technologies Enabling Agile Manufacturing, or TEAM program.

The three Lab employees shared a Technology Partnership Customer Service Organizational Achievement Award from DOE. Sandia National Laboratories and Lawrence Livermore National Laboratory as well as DOE facilities in Kansas City and Oak Ridge, Tenn., also were recognized for their achievements in the innovative program.

At a ceremony in Washington, D.C., former DOE Secretary Hazel O'Leary recognized Birchler, Meier, Weinacht and other members of the project for their positive impact on the nation's design and manufacturing capabilities.

The TEAM program is a DOE initiative aimed at advancing and

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Hockaday named P-23 group leader

Mary Hockaday

Mary Hockaday is the new group leader for Neutron Science and Technology (P-23). She served as acting deputy group leader for P-23 before this assignment. Other leadership roles during her career at the Laboratory include deputy group leader of Hydrodynamics and X-ray Physics (P-22), deputy group leader of Fast Transient Plasma Physics (P-14), acting group leader for P-14 and weapons physics project leader for the Advanced Thermal-Hydraulic Energy Network Analyzer, or ATHENA.

Hockaday said one of her goals as the new group leader for P-23 is to better learn the physics of the group overall. "Our group does such science as weak interaction physics, quantum computing and cryptography, solar neutrino work, nuclear weapons archiving, hydrodynamic experiments and other fields," she explained.

"Because this group is so diverse in what it does, I need to understand the science behind them all." Hockaday said another major goal will be to demonstrate and maintain fiscal responsibility within her group, while also allowing the level of science within P-23 to grow.

Raised in Hawaii (she moved there from California when was 7 years old), Hockaday received her bachelor's degree in physics with distinction from the University of Hawaii in 1980. She received her master's and doctoral degrees in physics from New Mexico State University in 1984 and 1986, respectively.

Her other accomplishments include being a co-recipient of the 1991 Award of Excellence for Significant Contribution to the Nuclear Weapons Program for the Nova Weapons Physics Experimental Team. She received a similar award in 1994 as part of the Hydrodynamic Driver Experimental Team.

March employee service anniversaries

30 years
Donald Bartram, P-22
Richard Belian, NIS-2
Jerry Davis, AOT-5
Anthony Padilla, DX-5

25 years
Pedro Aragon, BUS-4
John Archuleta, EES-8
Larry Clark, P-24
Johnny Harper, CST-7
Manuel Jaramillo, MST-6
Gregory Kubas, CST-18
Stephen Quintana, MST-6
Nijole Saponara, CST-8
Anthony Sgro, X-PA
John Stokes, P-22
R. James Trainor Jr., P-DO

20 years
Robert Albers, T-11
Debra Archuleta, ESH-17
Mary Campbell, DX-2
James Clifford, CIC-5
Robert Dinwiddie, ESH-1
Barry Drennon, EM-ER
John Dukowicz, T-3
Mike Geelan, AOT-7
Laura Liles, BUS-2
Paul Lujan, BUS-4
Melvin McCorkle, FSS-DO
Carolyn Mangeng, NWT-PO
Louis Montoya, DX-5
Byron Palmer, CST-3
Vicky Romero, CIC-17
Johan Rutten, ESA-DE
Jack Shlachter, P-22
Lilly Silva, HR-5
Michael Smith, CIC-13
B. Clarence Torres, CIC-10

15 years
Michael DeMaria, DX-4
Will Foreman, NIS-8
Kenneth Griechen, ESA-MT
Gerald Leeches, ESA-WMM
Schon Levy, EES-1
Peter Lomdahl, T-11
John Merrill, AOT-6
Janet Newlin, CST-7
Susan Padilla, ESA-FM-ESH
Richard Robinson, CIC-9
Laverne Rodriguez, NIS-9
Norman Schroeder, CST-11
Stanley Simmonds, ESH-10

10 years
Carlton Darnell, FSS-6
Thomas Lyttle, TSA-5
Richard Smith, T-3
Keith Woloshun, ESA-EPE

5 years
Claudine Armenta, CST-9
Brian Aubert, ESA-EA
Carl Beard, TSA-3
Joseph Bowden, ESA-WE
Cynthia Bustos, STB-DSTBP
Don Dale, CST-9
Frank Dickson, LC-LEL
Joseph Duke Jr., MST-7
Leslie Duncan, AOT-6
Tracy Erkkila, ESA-EPE
Kreg Gauss, MST-FAC
Lawrence Goen, ESA-EA
Angelina Gonzales, BUS-5
Christine Gonzales, BUS-2
Derek Gordon, NMT-8
Robin Gurule, BUS-1
Kevin Hale, ESA-WE
Hans Hartse, EES-3
Daniel Kathios, NMT-2
Dale Leschnitzer, CIC-6
Judi-Anne Martinez, BUS-1
Rhonda McInroy, CST-6
Gregg McKinney, X-TM
Leroy Padilla, BUS-6
Karen Paige, CST-7
Guy Sandusky, BUS-1
William Smith, NMT-6
Wendy Soll, EES-5
Raymond Tell, FSS-21
Robert Tirey, ESH-OIO
Kirk Weisbrod, ESA-EPE

Three ESA-EA employees ...

continued from Page 8

Left to right: Robert Meier and Wilbur Birchler. Not pictured is Dan Weinacht. *Photo by Fred Rick*

deploying manufacturing technologies that promote agility in product realization from concept through production and eventually to delivery and deployment, said Meier.

The program is harnessing capabilities of more than 50 partners from government, industry and academia to achieve significant improvements in manufacturing, he said.

The new process, Meier said, will replace serial design and manufacturing with concurrent processes to eliminate redundant design activities. This will speed up the product delivery time and reduce cost for both defense and commercial manufacturing operations.

The new process also replaces expensive trial-and-error prototyping on factory floors with inexpensive, rapid virtual prototyping of products and manufacturing processes.

The new product realization process also reduces material, rework and scrap costs by optimizing designs for performance and produceability before products reach the factory floor.

O'Leary said, "TEAM is providing the Department's weapons program with state-of-the-art techniques that otherwise would not be available."

Tactical goals ...

continued from Page 7

Reducing the Threat of Nuclear, Biological and Chemical Proliferation and Terrorism

Champions: Don Cobb and Walt Kirchner

• The Lab hosted a biological/chemical conference last May. The conference helped support legislation establishing a role for DOE in responding to biological/chemical threats.

• A multidivision team is developing a five-year biological/ chemical program plan for the Lab. The team also provided technical support to DOE.

• The Lab received $6 million in biological/chemical funds from DOE in January. The Department of Defense provided similar funds.

• Efforts continue in programs designed to strengthen the lab-to-lab relationship with Russia in nuclear materials control and accountability.

Did you know...

The early Cray supercomputers used by the Lab had about 61 miles of densely packed wires conducting electronic information.

"Science at Home" is a publication developed by Science Education Programs (STB/SE) to interest children, particularly those in grades four through eight, in science through hands-on activities. We are reprinting experiments from the book for employees to share with their families, or just to enjoy themselves.

Caught in a Vortex

Anyone ever caught in a tornado can tell you that the experience is pure terror. First there is a deadly silence, then, from out of nowhere, a roar that sounds like an out-of-control freight train. Objects fly about, windows shatter, and buildings begin to rock. Then, suddenly, silence returns. Moving into the distance, the dark black funnel cloud wreaks havoc as it goes.

What gives tornadoes such awesome power? How do they get started and where do they come from? In this activity, you will build a device to explore what makes a tornado spin. Using a sealed system of air and water to observe how fluids move and flow, you will learn what a vortex is and why it is a common flow pattern in nature.

The Stuff You'll Need

Scissors; two empty 1 or 2-liter bottles without lids or plastic rings; one metal washer with a 3/8 inch hole; electrical tape; water; food coloring; and a flat surface

Here's the plan

1) Fill one bottle three-fourths full of water. Add five to 10 drops of your favorite food coloring. Dry the mouth of the bottle and place the washer on top of it so that it is centered.

2) Turn the second bottle upside down and place it so the mouth is on top of the first bottle and washer. Make sure the bottles are centered. Seal the bottles together by tightly wrapping electrical tape around the bottle mouths and necks (diagram 1).

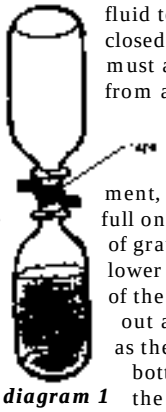


diagram 1

3) Flip the two bottles so that the one containing the water is on top. Set the empty end of the pair on the table. What happens to the water? You may have noticed that the flow of the water either slowed or stopped completely.

4) Now, grasp the two bottles at their connecting point. With the water-filled bottle on top, spin them around in a circle several times (diagram 2). Hold the bottles upright and observe what happens.

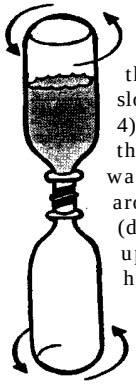


diagram 2

5) How is the flow of water different in step 4 compared to step 3? After rotating the bottle, what do you see happening to the water near the walls of the bottle? What do you see happening in the center of the bottle? Spin the bottles faster or slower. What changes do you see?

Wrap-up

When you first turned the bottles without rotating them, you probably noticed that some water flowed into the lower bottle and bubbles of air moved into the top bottle. After a few seconds, the flow of water either slowed or stopped completely. Once you began rotating the bottles, the water again began to flow into the lower bottle. Even after you stopped rotating the bottles, the water continued to spin. If you got the speed just right, you observed a whirlpool or vortex forming in the center of the upper bottle. As you changed the speed, the vortex either became more pronounced or slowed down, but it continued until all the water drained from the upper bottle.

What's going on here?

In order for a fluid like air or water to flow from one place to another, something must push it. In open systems like a riverbed, the push is provided by the force of gravity. In closed or sealed systems like a drain pipe or your soda bottle tornado, other factors, in addition to gravity, often come into play. For a fluid to flow in a closed system, it must always go from a region of high pressure to an area of low pressure.

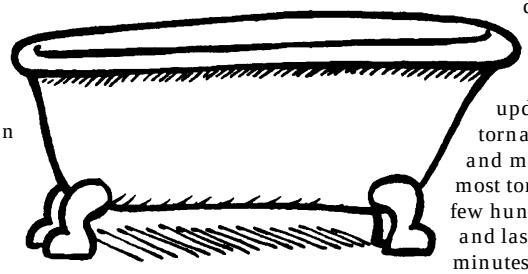
In the first part of your experiment, you turned the bottles so that the full one was on top. Because of the force of gravity, water began to flow into the lower bottle. As the water flowed, some of the air in the lower bottle was pushed out and bubbled up to the top. As long as the air could make it out of the lower bottle, gravity alone would provide the push or pressure to keep the water flowing down. Because the opening between the two bottles was made narrow by the washer, the air and the water had a difficult time getting past each other. Eventually, the pressure of the air inside the lower bottle exactly equaled the pressure of the water in the upper bottle, and the flow of water down and air up stopped.

To get the system moving again, another force was needed. That new force was the spin you gave the water when you rotated the bottles. The force of the spin pushed the water toward the walls of the bottle. This force put more pressure on the water near the walls than on the water in the center of the bottle. The higher pressure near the walls forced the water upwards, forming a depression in the top of the water. As the water spun faster, the depression grew and eventually reached the opening of the bottle. The reduced pressure at the center, and the opening of the depression within the system, "unclogged" the drain allowing air to move freely from the bottom bottle to the top. Once this happened, the water in the top bottle quickly drained into the lower bottle under the influence of gravity.

Where does this happen in real life?

Vortices like tornadoes, and the water running out of your bathtub, and down your toilet usually get started because of differences in pressure within a fluid. In tornadoes, this pressure difference is caused by unequal heating and cooling of air by the ground below. As air gets warm, it expands, becomes less dense and causes a drop in pressure. A tornado begins when a narrow band of air expands so rapidly that it forms an area of extremely low pressure and suddenly rises. This is called an updraft.

Air from outside the updraft rushes into the low pressure zone to try and fill empty space. Since air rushes in from all directions, it begins to spin. As long as heat energy keeps the updraft going, the tornado gains speed and moves. Luckily, most tornadoes are only a few hundred meters wide and last only a few minutes. This phenomena can happen on a much larger scale, however, resulting in a full blown hurricane.



Inside your bathtub drain, the vortex is not created by temperature, but instead by the direction of the water's flow. If you feel the drain area of the bathtub, you'll notice that it's not flat. This uneven surface is specifically designed to direct the water into the drain and get it spinning. The water flowing in the vortex may swirl in either a clockwise or counterclockwise motion. Some books will tell you that the water will swirl in one direction above the equator and the opposite direction below the equator because of Earth's rotation. Unfortunately, this is not true.

Known as the Coriolis force, this phenomena does explain why wind patterns on Earth change direction north and south of the equator, but it has little or no effect on bathtubs!

Now try this

Add a drop of liquid soap or rubbing alcohol to the water in the bottles. What changes do you see? Look around your house and in books to see other places where vortices form.

This month in history

April

1605 — Gov. Don Juan de Oñate leaves the first record on Inscription Rock in west central New Mexico

1775 — The shot "heard 'round the world' " is fired at Lexington, Mass.

1946 — Zia Co. takes over the responsibility for most construction and technical area maintenance at the Laboratory from the Army

1953 — James Watson and Francis Crick report the discovery of the double helix structure of the DNA molecule

1961 — Soviet cosmonaut Yuri Gagarin becomes the first person to orbit the Earth

1961 — IBM's Stretch computer, described as the world's most powerful, is delivered to the Laboratory

1988 — The Department of Energy designates the Laboratory as one of three Superconductivity Pilot Centers

1988 — A massive generator, consisting of a 451-ton stator and a 240-ton rotor, arrives at the Lab after a five-month trek from Tennessee by barge, railway car and truck

1993 — ALEXIS, a satellite designed and built at the Laboratory, is launched into orbit from an Air Force B-52

1993 — The Bradbury Science Museum moves from its longtime location at TA-3 to a new building in downtown Los Alamos

1996 — The Dome Fire breaks out west of Bandelier National Monument and eventually covers nearly 17,000 acres

Brainteasers

Here's a chance for you to show off your knowledge of history and trivia. Sorry, there are no prizes, other than self-satisfaction.

1. Who served as acting Laboratory Director twice?

2 Who was the Lab's first deputy director?

3. Who was the first secretary of energy?

4. Who was Harold Agnew's secretary when he was director?

5. Identify Brooklyn Betsy.

6. What's missing from this 1981 picture? **(below)**

7. What staff member was on the two-person team that made the first ascent of 25,600-foot Masherbrum Peak in the Himalayas?

8. How did the critical assembly called Lady Godiva get its name?

9. Who established the Los Alamos Ranch School?

10. Who was the first physicist recruited to teach science at the Los Alamos Ranch School?

11. Where is Lower Slobbovia?

12. In 1956, CMR Division was divided into CMF and CMB divisions. What did the "F" and "B" stand for?

13. Who was the first leader of T Division?

14. Who were Henry Farmer and Nicholas Baker?

15. Which Manhattan Project physicist was known for his lock-picking skills?

16. What two publications merged in 1981 to form the Newsbulletin?

17. What was ALAS?

18. What was the name of the steel vessel built to contain the explosion of the first atomic device?

19. What was "Mike"?

20. When did Ronald Reagan visit the Laboratory?

21. When was the first issue of Los Alamos Science published?

22. What was J. Robert Oppenheimer's first name?

23. What was the lifetime of the Energy Research and Development Administration?

24. What Laboratory group has the shortest name?

25. Identify this 1980 visitor to the Lab. **(at left)**

26. What was the Perhapsatron?

27. How did Bathtub Row gets its name?

(Answers next month)

Syndicated material removed at the request of the syndicate

March crossword puzzle solution

A	G	I	L	I	T	Y	■	M	O	N	T	E
L	U	N	A	C	Y	■	M	A	N	I	A	C
L	I	T	R	E	■	S	T	R	E	T	C	H
■	■	E	D	■	O	K	■	■	S	S	■	O
B	A	R	■	E	N	I	A	C	■	■	■	■
I	G	N	O	R	E	■	M	A	S	S	E	D
R	E	E	V	E	■	■	■	R	O	W	D	Y
D	E	T	A	C	H	■	A	L	L	E	G	E
■	■	■	■	T	A	N	G	O	■	E	E	S
E	■	E	M	■	■	I	E	■	L	T	■	■
D	I	G	I	T	A	L	■	H	I	P	P	I
A	N	A	L	O	G	■	D	E	M	E	A	N
M	A	D	L	Y	■	G	E	N	B	A	N	K

spotlight

Laboratory 'tromboneheads'?

by Ternel Martinez

Let's say you're watching the Santa Fe Great Big Jazz Band perform one night in the City Different. It's only natural that you would take the time to look at the musicians as they play their respective instruments.

Now it's two weeks later, and you're listening to the Los Alamos Symphony. Again, you take the time to look at the musicians. But this time, you think you recognize one, perhaps two or maybe three trombone players. You ask yourself, "Where have I seen these people before?"

Fast-forward to a month later. You're now in the Duane W. Smith Auditorium in Los Alamos waiting for a musical play to begin. Once again, you look at the musicians — and like before — you think you've seen some of the trombone players before. "It can't be. Not again!" you might say to yourself.

Well, before you make an appointment to see a psychiatrist or optometrist, relax. You see, most of these trombone players actually play in several different bands or musical groups. And most of them work at the Lab.

New unofficial staff classification? In addition to Techheads and Coneheads, the Lab also has Boneheads — Tromboneheads, that is. Among the several bands that these brass head-plated men play in are the Los Alamos Big Band, Los Alamos Symphony, Los Alamos Light Opera, High Mesa Brass Quintet, Rio Brass, Sangre de Cristo Brass, Santa Fe Community Orchestra, Santa Fe Community Band and Santa Fe Great Big Jazz Band. Pictured top to bottom and left to right: John Hendricks of X-TM, Phil Jones of T-3, Scott Doebling of ESA-EA, Al Williams of CIC-12, Lynn Byers of CIC-1, Larry Bronisz of ESA-MT, Doug Lora of CIC-7, Jerry Morzinski of TSA-9 and Stan Brown of AOT-8. *Photo by Fred Rick*

The ones responsible for probably making you doubt your sanity are Doug Lora of Computing (CIC-7); Larry Bronisz of Measurement Technology (ESA-MT); Al Williams of Software Design and Development (CIC-12); Phil Jones of Fluid Dynamics (T-3); Jerry Morzinski of Human Factors (TSA-9); John Hendricks of Transport Methods (X-TM); Stan Brown of Controls and Automation (AOT-8); Scott Doebling of Engineering Analysis (ESA-EA); and Lynn Byers of Communication Arts and Services (CIC-1).

Take Lora, for example. In addition to the bands mentioned above, Lora plays with the Los Alamos Big Band. He also plays regularly for his church. Morzinski does the same, plus he plays in two quintets. "There are probably more trombone players per capita at the Lab than anywhere else in the country," mused Lora.

"I've heard of studies that point to a correlation between those who work with computers and being a musician, but as for the reason why there are so many trombone players in this area, it's a mystery to me."

While Lora likes several kinds of music, his favorite is jazz; he therefore enjoys playing with the Santa Fe Great Big Jazz Band the most. Morzinski prefers playing in quintets. "With quintets, your part is always an important part," he said.

To be sure, the Lab trombone players have never all played at the same performance. "Big band or jazz band arrangers normally write music for four or five trombones at most," Lora explained. "For most other types of music, arrangers write for only two or three trombones."

That may change, however. "Phil Jones wants us all to get together and perform a Moravian trombone choir arrangement at a local church. The choir consists of 12 trombones, and we may just do it," said Morzinski. He said the additional trombone players needed to perform the choir would probably come from town.

Lora and Morzinski both joked that trombone players sometimes don't get the respect they deserve. "Trombones don't have the kind of fanfare quality that other instruments like trumpets do," said Morzinski, "but perhaps one of the reasons why other musicians make fun of us is because a trombone is the only brass instrument capable of playing in perfect pitch."

Lora added, "Not too long ago, the trumpet players in the Santa Fe Great Big Jazz Band sent out a list of fines dealing with trombone players. One said, 'Talk to a trombone player — $5 fine.' And another said, 'Play a duet with a trombone player — $10 fine.' We're the butt of jokes sometimes, but it's all in fun."

Reflections
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