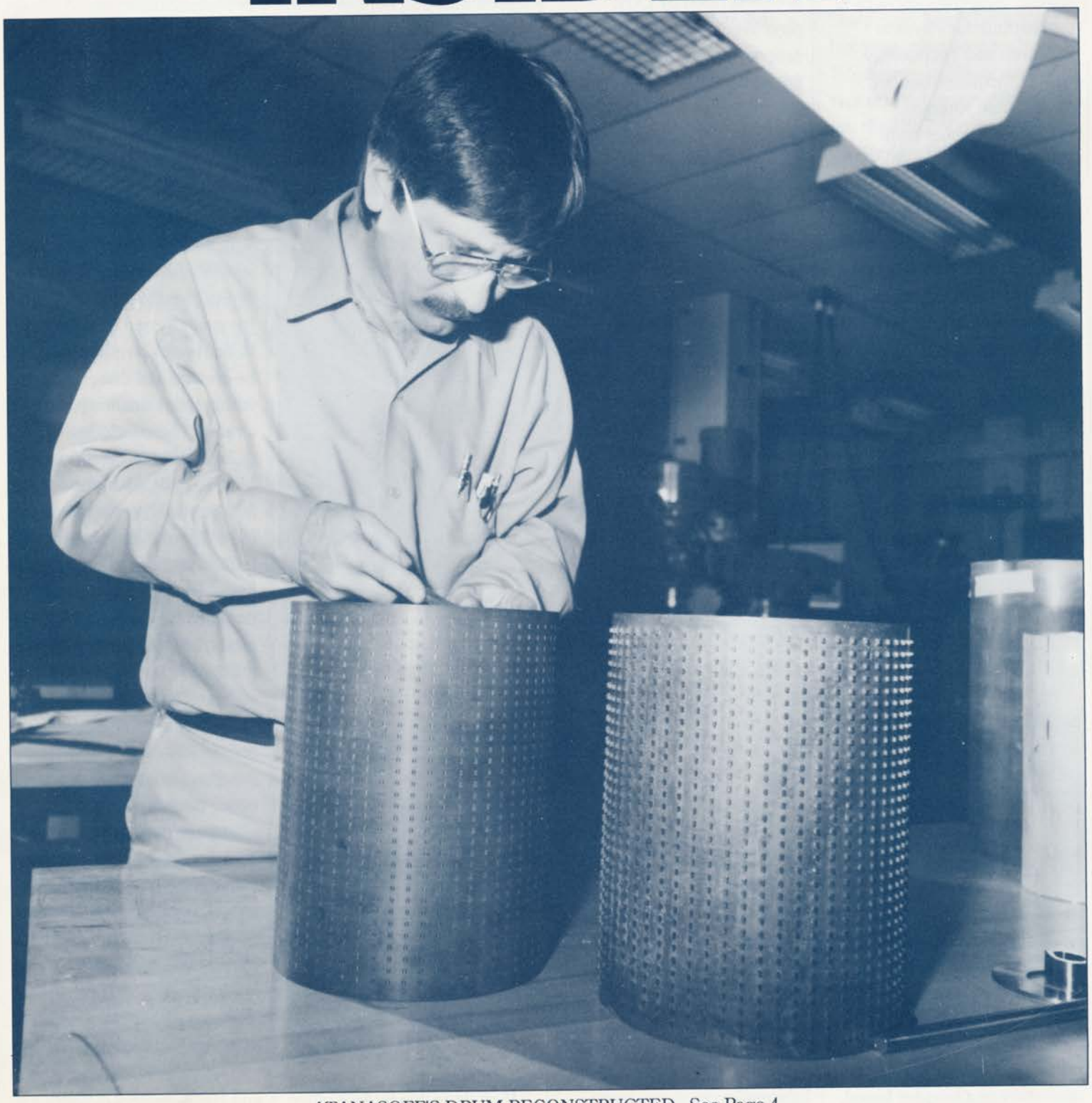
Newsletter for the Employees of the Ames Laboratory • Volume 1 Number 3 • March 1990

AMES LAB INSIDER



ATANASOFF'S DRUM RECONSTRUCTED - See Page 4.

They Hold The Purse Strings

The main function of the Budget Office is to assist in the preparation, administration and control of the Ames Laboratory budget. We also provide budgetary services to the Institute for Physical Research and Technology (IPRT)," explains budget officer, Dale Knutson.

The six-member staff includes the budget officer, assistant budget officer, three accountants and an account clerk.

"When I started my employment on April 1, 1956, we were operating on less than a $3 million budget, of which more than 90 percent was supported by the Physical Research Program of the AEC, later known as the Basic Energy Sciences Program of the DOE. Work-for-others was non-existent," according to Knutson.

"We closed financial year 1989 with operating expenditures of over $20 million, of which Basic Energy Sciences supported only 66 percent and work-for-others of all types comprised some 11 percent of the total operating costs.

"Since the inception of the Ames Laboratory there have been only three directors, and with 33 years of service, I've worked under all three. We have seen a number of changes in the way DOE operates as well as seeing the Laboratory progress from primarily a single focused laboratory to a broader based, multipurpose organization," Knutson recalls.

When asked to describe the budget proposal process, he responded, "Budget proposals are prescribed by DOE directive. Ames Laboratory proposals to DOE are developed locally and presented to the Chicago Operations Office (CH) and Headquarters in Washington D.C. in accordance with those directives.

"Locally, the most widely recognized budget schedule is a series of documents called the Work Authorization System (WAS) budget proposal. In addition there are another 20 or so budget schedules, that are required with the submission of the WAS schedule. These budget schedules involve such information as stores inventory levels, work-for-others, general plant projects, repair and maintenance, automotive and other data needed by DOE to complete the financial support requirements of the Laboratory," Knutson explains.

"The narrative portion of the WAS is furnished by the Ames Laboratory scientific community and budget personnel assist in producing the dollar portions of the proposals. The Laboratory director and his designees, working in cooperation with program directors, review, approve and finalize the WAS document before it is ready for final printing, binding and mailing. A team of personnel from Chicago Operations Office comes here to review and make suggestions prior to the submission. The process is a large undertaking and generally starts in mid-December and is due in early April," Knutson adds.

The budget office crew: Dale Knutson, Diane Drake, Belinda Schafbuch, Ila Haugen, Patrecia Emley, Marg Paradis.

How does this budget office differ from corresponding offices at ISU or a large corporation?

"The primary difference, as I see it, between the operation here and industry, is that we are a non-profit organization. A for-profit organization functions in a business environment of forecasts of sales/services and the costs of producing those sales/services. Their budgets are flexible and tend to be open ended. Eventually all factors translate to the bottom line which is profit or loss. A non-profit organization such as ours, functions within imposed financial constraints with budgets that are much less flexible. Our bottom line is represented primarily by the quantity and quality of basic research results that can be created and disseminated within those financial constraints," he concludes.

Assistant budget officer, Marj Paradis, says there are a few parallels between managing a $20 million annual budget and a much smaller one at home. "Essentially, both involve allocating limited funds for the best possible utility. We have a new software package that will help us better manage our personnel costs which account for approximately 75 percent of our budget. We have the advantage of accessing several computer databases to help us with different financial management tasks. I think we are fortunate to have these resources readily available to us. A good portion of my daily effort is spent using a variety of computer applications.

"Our rapport with both CH and Headquarters is very

important. For instance, during a continuing resolution, only a portion of the annual funds for each program may be received. Projecting estimates for needed funding during this interim period is critical for program continuity in a financial sense. We use our field office as a facilitator, but we are not hesitant to call HQs when it becomes necessary.

"We have an excellent track record with CH, especially in turnaround time on special and scheduled reports. I have often heard CH personnel comment positively on our reliability," she says. Paradis has worked in the Budget Office for four years, coming here from a similar position at Oklahoma State University.

Accountant Patrecia Emley has been with the Budget Office for 15 years. She assists a number of programs with budgetary functions and is responsible for the payroll projection information. "We have the opportunity to work with practically every office within the Laboratory," she says. "The variety provides an overview of the total financial and manpower picture of the Ames Laboratory."

Accountant Ila Haugen assists a number of scientific program directors with budgetary management of their accounts as well as handling all the overhead/indirect type of accounts. Examples of overhead/indirect accounts are the administration and operations divisions along with the director's offices and utilities. Haugen also keeps track of the effect of vacation change because of its effect on the total laboratory costs.

Account clerk Diane Drake is the receptionist and support person for the office. She sees all purchase orders for the Laboratory to ensure that the proper account is charged, and sets up all job orders. Drake monitors all capital equipment accounts for the Lab, assisting program directors with their respective accounts. She provides all the secretarial support for the Budget Office: word processing, graphics, distribution of monthly cost reports, coding changes, filing, ordering supplies, and other miscellaneous duties. Being proficient with her computer work station enables her to handle a variety of duties. Drake has ten years' experience.

Recently transferred from the Accounting Office, Belinda Schafbuch is making an intense effort to pick up the basics of budget accounting. She joined Ames Laboratory last year, after earning her B.S.degree in Finance at ISU. Her primary responsibilities are the IPRT accounts within the Budget Office. ❑

Avinash Pancholi

Ames Lab Veterans Join 25-Year Club

Ten employees of the Ames Laboratory who recently completed 25 years of service to Iowa State University were inducted into the prestigious 25-year club this month.

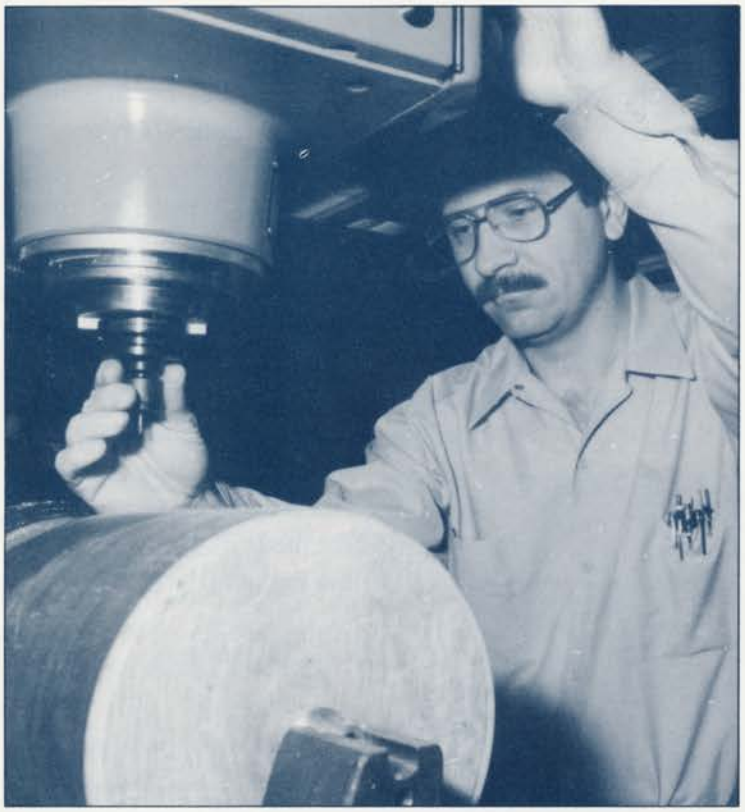
Their services were recognized at a glittering banquet at the Memorial Union on February 26.

The club, sponsored by the ISU Alumni Association has 1,000 members representing employees from every department on campus.

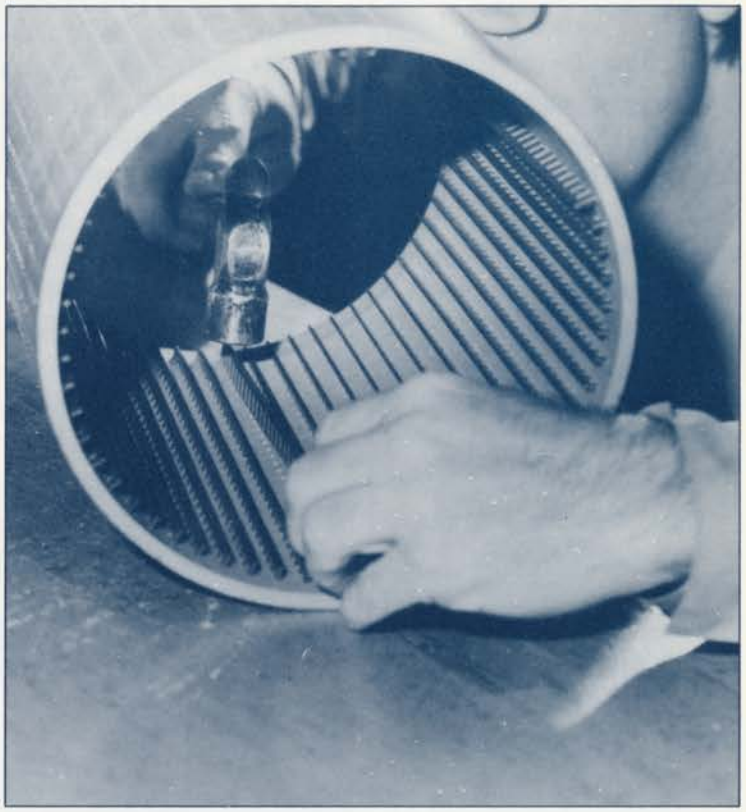
The Laboratory employees who joined the club are: Nile M. Beymer, Ronald G. Foderberg, Jerry L. Hand, James J. Holl, John F.Homer, Jr., Thomas Johnston, Kenneth E. Lassila, Clifford G. Olson, Rohit K. Trivedi and Carl D. Westberg. ❑

Front row (left to right): Rohit Trivedi, James Holl, Carl Westberg
Back row: John Homer, Thomas Johnston, Kenneth Lassila, Jerry Hand, Ronald Foderberg

Atanasoff's Drum Reconstructed



Kent Mogard operates the computerized milling machine programmed to automatically drill the 1632 holes in the drum.



Kent Mogard pounds the pins into place.

Fifty years ago in the basement of the old Physics Building, John Vincent Atanasoff invented and built the first electronic digital computer. Today, the Ames Laboratory shops are replicating that computer's memory drum. The original drum will be on loan to the Smithsonian for three years to be displayed in the Information Age exhibit opening in May in the National Museum of American History. While the original drum is on loan to the Smithsonian, the replica will be on display later this year in the Durham Computation Center lobby, just off the atrium.

Ames Lab Replicating Drum

Kent Mogard, senior machinist, is using his expertise to build the replica of the Atanasoff drum. The drum is a cylinder 11 inches tall and 8 1/2 inches in diameter. It contains 1632 brass pins arranged in 51 rows with 32 pins per row. "The replica will look as much like the original as we can make it," Mogard says. "This will include making watermark stains, tarnishing the pins and gouging the beeswax insulation. We are forcing it to weigh 19 pounds by adding lead weight as we pour in the beeswax." It is not known exactly what the inside of the drum looks like but all visible parts will be identical.

"The original craftsmen did an amazing job. They worked with tolerances of 1/1000th of an inch. To do this by hand is a real talent," Mogard says. Ironically, part of the replica is being made by a computerized milling machine. Holes for the pins are being drilled by a numerically controlled machine that was programmed to drill the holes in the exact locations as the original. These pins are connected to capacitors, modules for storing electrical energy.

Roland Struss, associate director for operations, has been coordinating the drum reconstruction. "The replica will cost about $2500 and will take approximately 80 hours of work to complete," he says. "Kent and I spent four hours together, making the drum look distressed and antique. When we were done it was difficult to tell which one was the original."

The First Computer

As a graduate student at Iowa State College (master's degree, 1926) and the University of Wisconsin (doctorate in 1930), Atanasoff was frustrated with his need to solve simultaneous equations. He spent hours on a calculator working out the complicated mathematical problems related to his doctoral thesis. This drudgery piqued his interest in creating a faster computing machine.

Atanasoff became an assistant professor in mathematics and physics at Iowa State College in 1930.

One December night in 1937, Atanasoff left his office in Room 52 Physics in 20 degree below zero weather, disgusted with his failure to design a better computing ma-

Kent Mogard pours 12 1/4 lbs. of beeswax into the drum. The shell weighs 5 1/4 lbs and 1 1/2 lbs of lead was embedded into the wax in order to force the drum to weigh 19 lbs.

Rollie Struss (left) and Kent Mogard holding the original and duplicate drums, respectively.

chine. He jumped into his Ford V8 and with no destination in mind headed east. He was obsessed with his failure to find an answer to the unsolved computer memory problem. After a few hours of driving at high speeds he realized he was crossing the Mississippi River and was entering Illinois.

Deciding to get a drink before starting the long drive back to Ames, Atanasoff stopped at an Illinois roadhouse. (Iowa was a dry state at the time.) The intensity of the long drive had relaxed him. He suddenly realized that he was no longer nervous and tense and his thoughts returned to his computing machine. During the two or three hours he was in the roadhouse his mind cleared, he began generating ideas and everything finally came together.

Atanasoff spent the next several months refining the design of his computer. In 1939 he requested $650 from the Iowa State College to produce an electronic digital computer. The request was approved and that $650 grant has to be one of the wisest investments of the 20th century.

Atanasoff used $450 to hire a promising electrical engineering graduate student named Clifford Berry. The remaining $200 was used for materials.

The first task was to find the space to construct the computing machine. The main floor of the Physics Building was in use but Atanasoff located some space in the unfinished basement. Here, he and Clifford Berry, built the first operational electronic computer, to be known as the Atanasoff-Berry Computer (ABC).

In 1942 Atanasoff left Iowa State for a defense-related position at the Naval Ordnance Laboratory in Washington, D.C. Atanasoff and Berry had completed all the paper work and drawings necessary to apply for a patent, and assumed that it would be done. Iowa State did not follow through, however, and failed to apply for the patent because of lack of interest. Atanasoff felt his computer was never more than a big curiosity at Iowa State and

DRUM / *Continued on Page 7* ➪

Legvold Legacy

Dr. Sam Legvold was a student of Atanasoff at Iowa State College. Later, Clifford Berry became the first of Legvold's 35 Ph.D. students. Legvold was a nationally and internationally recognized pioneer in rare-earth metals research. His early research on properties of rare-earth metals opened the frontier for superconductivity developments, in which today, Ames Laboratory is playing a leading role. When he retired in 1979, Legvold was a senior physicist at the Ames Laboratory, professor emeritus of physics, and a distinguished professor of science and humanities at ISU. Legvold died in 1985.

Atanasoff, now 87 and in fair health, still lives in Maryland.

BULLETIN BOARD

A free "bring one, take one" book exchange is available outside the photocopy room, 209 Spedding. Please bring any extra books you would like to contribute to help us get started and enlarge our supply. Everyone, including spouses, is welcome to participate.

Salaries and expenses for Ames Laboratory graduate assistants participating in the Iowa Governor's Institute for Talented and Gifted students and the ISU CY-TAG program will be paid by the Office of Precollegiate Programs for the Talented and Gifted. Contact Lynn W. Glass, Associate, 4-7006, if you wish to participate. See the February Insider Bulletin Board for more details.

Ames Laboratory/IPRT researchers may be interested to know the Engineering Services Group subscribes to the technical Journal, *Review of Scientific Instruments*. These journals may be borrowed by contacting the ESG Office, 158 Metals Development, 4-3757.

Vacuum pumps needing repair or service should be brought to Jerry Hand, the development machine shop manager and a Vacuum Pump Service Request form completed. Please do not deliver unlabelled pumps to the vacuum pump repair area in 161 Metals Development.

Would the person who borrowed the Mayo Clinic Health Letters Notebook, 1985-86, please return it to the Medical Office, 144 Spedding.

When ordering information from Government Data Publications, be aware that there will always be a charge associated with the order. The company's order form is misleading and cost information is in extremely find print. Be sure to read all the order information; the products are not free and you will be invoiced for the material you order.

SEMINAR NOTICES. All submissions to the weekly Ames Laboratory/IPRT Seminar Notice must include speaker's name, date, time, place, and topic. Please be sure all information is correct. The submission deadline is every Wednesday, 10:00 AM. Please submit to Donna Millang, 201 Spedding, 4-1856.

The BULLETIN BOARD is an effective method of making announcements and providing information. Please feel free to contribute items by calling Dianne Borgen, 4-5635 or Burt Gleason, 4-5638.

COMPUTER SECURITY

In the inaugural article on Ames Laboratory computer security we discussed why the Laboratory must have a computer security program.

As in all matters associated with the Federal government there is a structure to computer security. Each Operations Office has a Computer Protection Program Coordinator (CPPC) who oversees the contractor sites. Mr. Ken Cramer is the CPPC for the Chicago Operations Office. The Ames Laboratory computer protection program is administered by Frank S. Carlsen, who is the Laboratory Computer Protection Program Manager (CPPM). In addition the Ames Laboratory program directors, administrative office managers, and IPRT directors have each appointed an Assistant Protection Manager (APM) to assist the CPPM in their functional area.

Generally the APM has the following computer security duties:

1) Attend computer security informational briefings, educational courses and seminars as recommended by the CPPM and approved by the respective program director or office manager.
2) Disseminate computer security materials to other employees within the APM's area of responsibility.
3) Assist the CPPM in providing computer security training to Ames Laboratory/IPRT personnel as requested by the CPPM.
4) Conduct risk analyses on DOE program area/office computers and/or applications.
5) Report security incidents that occur in the program area/office to the CPPM.

A bulletin board is maintained by the CPPM for the purpose of disseminating information to Ames Laboratory/IPRT personnel. For employee convenience the bulletin board is located on the first floor of Spedding Hall directly across from the store room window. The bulletin board has a current list of assistant protection managers, the official Ames Laboratory policy statement on computer security, and Guidelines for Safe Computing document.

All employees are urged to familiarize themselves with the information on the bulletin board.

In addition, the bulletin board contains the latest information bulletins from The Computer Incident Advisory Capability (CIAC). These bulletins usually describe the latest outbreak of intrusive code: virus, worm or trojan horse, or hacker activity.

CIAC is a DOE funded entity located at Lawrence Livermore National Laboratory. CIAC is charged with investigating and developing methods of detecting and eradicating all types of hacker and/or intrusive code threats to DOE computer and network facilities. ❑

➪ **DRUM** / *Continued from Page 5*

there had been little enthusiasm for his invention.

Atanasoff returned for a visit in 1948, and was horrified to learn that the Atanasoff-Berry Computer had been dismantled and destroyed. It had been demolished by a graduate student at the request of the head of the physics department, thought to be jealous of Atanasoff's achievement. Neither Atanasoff nor Berry had been contacted or given notice that it was to be removed and discarded for junk.

A few parts of the historic Atanasoff-Berry Computer were rescued by Dr. Sam Legvold and other close friends of Atanasoff. When the computer was being dismantled, Legvold salvaged one of the rotating memory drums and kept it in his office. It has been reported that Legvold kept it on a window ledge for 20 years.

Legvold had been there to see the world's first automatic electronic computer operate. He speculated that the machine Atanasoff and Berry had constructed had some importance, but he had no idea how significant it would be.

Thanks to Sam Legvold, an Ames Laboratory employee, a part of history was preserved. Thanks to the skill of another Ames Laboratory employee, Kent Mogard, history is repeating itself by the (computerized!) reconstruction of the Atanasoff-Berry Computer memory drum. ❑

Dianne Borgen

➪ **NEW** / *Continued from Page 8*

Mark Johnson,
Graphic Specialist
(Gene Pedersen)

Robert Kuethne,
Student Associate
(Bill McCallum)

Su Lin,
Postdoctoral Fellow
(Walter Struve)

Siquan Luo,
Visiting Scientist
(John McClelland)

Tom Majors,
Custodian I
(Lynn Runge)

Insoo Moh,
Student Associate
(Bill Spitzig)

Lydia Raser,
Student Associate
(Therese Cotton)

Mitchell Robertson,
Graduate Assistant
(Robert Angelici)

Phan To Su,
Graduate Assistant
(Nenad Kostic)

Carter White,
Student Associate
(Robert Angelici)

David Wilford,
Research Helper
(Norman Dietrich)

John Will,
Maintenance Helper
(Mark Godar)

Junxi Yan,
Associate
(Karl Gschneidner)

PROMOTIONS

Marlene Frisk
from Computer Operator II to Clerk IV

Gary Heck
from Facilities Mechanic to Area Mechanic

Ryszard Jankowiak
from Associate Chemist to Scientist

Steve Lee
from ERD Machinist Sr. to ERD Machinist Sr. Lead

Adieu To Lab But Not To Science

After 10 years of service, Vera David bids goodbye to the Ames Laboratory. She wrote many of the Ames Laboratory public information materials and was editor of the *Changing Scene*. She served as Public Affairs Officer for the past eight years.

David wishes to continue to work in the fields of science communication and social service from her home office. "I have many plans for retirement. I hope to do some medical writing, particularly on the cancer I had and for which I underwent an operation recently. The doctors told me that there is hardly any material for lay readers on treatment and prognosis of this type of cancer," she says.

"I shall continue to work for Amnesty International and protection of human rights. Now that I am retired, I shall get more time to read and travel. I also plan to write a book. It will be partly biographical, and will deal with a group of my generation who narrowly escaped the Holocaust," David says reflectively.

"With a bachelor's degree in chemistry and master's in communications, I finally found my niche when I landed this job at the Laboratory. I was already 49 when I joined here, but I decided it was better late than never," she observes.

"I have enjoyed working at the Lab very much. I felt I

Vera David

was learning a great deal about the research process, as well as the Laboratory research directions, and I have liked the people."

Asked about her key to successful science writing and editing of the *Changing Scene*, for which she has received praise from scientists and media circles within and outside ISU, David explains with a smile, "I tried to make it understandable for lay readers. Although some scientists may not consider themselves lay readers, science is so vast that they can't be profound experts in all scientific fields. I tried to simplify without talking down to people.

"Accuracy and lucid expression are also important for good communication. Inevitably, some young or inexperienced scientists insist on writing for their colleagues, and that sometimes poses a problem in reaching the general reader who is our audience," she adds.

Burt Gleason, with whom David worked during her decade with the Laboratory stated, "Ames Laboratory, and especially the Office of Information, will miss Vera's pithy remarks and rapid response to challenge. She carried a heavy workload, and almost single handedly produced the *Changing Scene*.

"Her contribution to humanity through her activities outside the Laboratory mostly went unnoticed because Vera is a rather private person outside her public information role. I look forward to reading her book someday so that I can even better appreciate this citizen of the world, Vera David," Gleason adds. ❑

NEW EMPLOYEES

Gary Ault,
Sheet Metal Mechanic
(Ralph Appelgate)

Patricia Boone,
Clerk Typist III
(Rose Bielefeldt)

Myron Bries,
Programmer
(Tom Johnston)

Beongki Cho,
Student Associate
(Doug Finnemore)

Brian Farrell,
Research Helper
(Bill Buttermore)

Raymond Garant,
Research Helper
(Bernard Beaudry)

Scot Goettsch,
Research Helper
(Frank Margetan)

Scott Haines,
Research Helper
(Rick Schmidt)

Terry Holesinger,
Student Associate
(Scott Chumbley)

NEW / *Continued on Page 7* ➪

AMES LAB INSIDER
Volume 1/Number 3/March 1990

Ames Lab Insider is published 12 times a year for the employees of the Ames Laboratory by the Office of Information. Ames Laboratory is operated by Iowa State University for the U.S. Department of Energy under Contract W-7405-Eng-82, and is administered through the Institute for Physical Research and Technology.

Address comments to:
Editor
201 Spedding Hall
Ames, IA 50011-3020
515/294-1856

Burton Gleason — *Editor*
Dianne Borgen — *Associate Editor*
Avinash Pancholi — *Graduate Assistant*
Scott Thornton — *Design Consultant*
Dennis Sailsbury — *Photographer*

Address correction requested
P-208-9