The Village Crier

national accelerator laboratory

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FROM ARCHIMEDES TO EVANESCENCE -- NAL'S WATER SUPPLY

Another new structure has risen on the NAL landscape, across Wilson Road from the Bubble Chamber. A textured concrete wall in the shape of an Archimedes Spiral, it provides an enclosure and an accessway for the pumping station at Casey's Pond, the main reservoir on site. The temporary pumps which have been operating there for the past few months will be removed once this station is completed later this spring.

This intriguing structure is just one part of the complex system which keeps NAL supplied with water. Water plays a very important role in the operation of the site. It is used for cooling the magnets in the accelerator system, for industrial purposes, for fire protection, for a very limited amount of irrigation, and, of course, for domestic consumption.

Originally, this portion of Illinois was a wet prairie, with clumps of trees on the high ground. During the years it was used as farmland, the prairie was drained, primarily by the use of underground tile. When NAL first came to Batavia, much thought was given to the problem of providing sufficient water on site, so as not to tax the resources of the surrounding communities. The solution was the creation of large water storage reservoirs and cooling ponds.

As a result, there are now four reservoirs -- Lake John Law and Lake Ephemeral, which collect water from the eastern portion of the site; the Sea of Evanescence, which collects water from the southeastern portion of the site; and Casey's Pond, the main reservoir in the northwestern portion of the site. The names Ephemeral (from the Greek, meaning short-lived, transitory) and Evanescence (also from the Greek, meaning gradually fading away) result from the fact that the Lakes were created by dams and they will vary in size, and perhaps at times, completely disappear during very dry years. Casey's Pond is named for K.C. Brooks, the AEC Area Manager who contributed so greatly to the success of the Project. John Law was a Scottish monetary reformer, who founded a French bank in 1715. He later merged it with the Louisiana Company, which had exclusive rights to the development of the French territories in the Mississippi Valley, which included the NAL site. The development scheme, the "Mississippi Bubble" failed, and

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...The Archimedes spiral, which can be described as the locus of a point moving with uniform velocity along the radius vector, while the radius vector moves about the pole with constant angular velocity. The Greek mathematician who devised this formula, Archimedes, lived in about 230 B.C. Among other things, he was known for his theory of the relation of the weight of a body to the amount of water it displaces. Casey's Pond is to the left...

Law died in Venice, a poor, but honest man. In all of these reservoirs, NAL has the capacity to store 140 million gallons of water, according to Plant Manager Bill Riches.

In addition to these reservoirs, there are twenty-five ponds which form a canal around the inside of the Main Ring. The water in these ponds is used for cooling the accelerator system -- perhaps the most important use of water on site. According to Hank Hinterberger, of Technical Services, NAL uses a combination of air and water cooling in the system -- the Linac, Booster and Main Ring are cooled by water; cooling for apparatus in the three experimental areas is provided, for the most part, by air coolers along the beam lines. Hinterberger and George Biallas were responsible for designing much of the system.

The electromagnets in the accelerator, which get hot from the electrical current used to energize the electric fields, are cooled by an independent system of low-conductivity water (from which nearly all of the mineral content has been removed in a de-ionizing tank, or giant water softener, in the B-0 service building). This water, de-ionized to prevent the magnets from shorting, circulates through them in the same copper tubing which carries the electrical current, and then is cooled as it passes through heat exchangers in each service building. Ordinary water from the cooling ponds circulates through the heat exchangers and then, in turn, is cooled by evaporation when it returns to the ponds. Make-up water is supplied by the reservoirs. The Booster Pond is used for cooling the Linac and Booster, as well as equipment in the Central Utilities Building nearby.

The primary source of water on site is rainfall, which is collected in all four of the reservoirs. In an average year -- one in which there about 34 inches of precipitation -- this is enough to supply all of the industrial water needs on site. In a below average year, the Laboratory could draw water from the Fox River via the pipeline from Batavia to Casey's Pond (so long as the river flows at an excess of 275 cubic feet per second). As yet, NAL has not used this pipeline. Another pipeline, actually an old gas line which passes under both Kress Creek and Lake John Law, has been connected so water from the creek can be pumped directly into that reservoir. This line was used once, in 1971.

All of the water for domestic use is supplied by three shallow wells, one in the Village and two at the main site. Each is about 200 feet deep. Another, very deep -- about 1600 feet-- well, has never been used. It would be required only in the case of an emergency, for example, as an adjunct to the fire-fighting water supply.

A new pond is under construction in the center of the Main Ring. It will be in the shape of the NAL logo. Neither it nor the reflecting pool near the Central Laboratory are part of the inter-connected water system.

...One of the cooling ponds in the Main Ring. The spray is caused by nozzles; they provide additional cooling, and increase the amount of oxygen in the water. To some extent, this aeration controls the growth of algae, and lessens the need for chemical control...

The operation and maintenance of this far-flung system is the responsibility of the men of Plant Maintenance and Operations, under the supervision of Bob Vanacek, Jack Morphey, and Bob Roberts. George Doyle and Jack Stahl, of Plant Services, have been primarily responsible for the installation and operation of the temporary pumps at Casey's Pond; the men of Plant Services are responsible for the reservoirs on the eastern portion of the site. All in all, they keep approximately 25 miles of underground piping and more than 100 pumps connected to the system operating smoothly.

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Photos by Tim Fielding, NAL

CONFERENCE PROCEEDINGS NOW AVAILABLE

...(L-R) Doris Pinneo, Rene Donaldson, and J.D. Jackson distribute Conference Proceedings...

Proceedings of the XVI International Conference on High Energy Physics are now available from the NAL Publications Office. The four-volume set is $20.00, plus $1.12 for postage when mailed off-site. Volumes may be ordered separately at $7.00 each, plus 28¢ postage. Only prepaid orders are being accepted. Checks should be made payable to "XVI International Conference on HEP Proceedings."

Contents of the Proceedings are as follows:

Volume 1 - Parallel Sessions (held at the University of Chicago)
Subject: Strong Interactions

Volume 2 - Parallel Sessions (also held at the University of Chicago)
Subject: Mostly Currents and Weak Interactions

Volume 3 - Plenary Sessions (held at the National Accelerator Laboratory)
Subject: Strong Interactions

Volume 4 - Plenary Sessions (also held at the National Accelerator Laboratory)
Subject: Mostly Currents and Weak Interactions

The black and white paperback books contain more than 2,000 pages, including numerous figures and tables. They offer interested persons a compact source of current high energy physics data. J.D. Jackson and Arthur Roberts served as scientific editors of the Proceedings. Angela Gonzales, Director's Office, was responsible for the art work and cover designs.

Sections within NAL desiring to have a set of the proceedings for the use of employees may send a purchase requisition or informal note for the volumes desired to Rene Donaldson, Publications Office. She will arrange an internal transfer of funds as payment for the books. Further information may be obtained by calling Rene at Ext. 3278.

Production and distribution of all books produced by NAL is only one of the functions of the NAL Publications Office. From a tiny room in the Directors Complex, adjacent to the duplicating facilities, a steady stream of technical memos and reports flows. Rene Donaldson and Doris Pinneo are responsible for the editing, typing, production and distribution of the publications which report on the research work being done at NAL.

The Monthly Report of Activities, distributed outside the Laboratory, is also produced by the Publications Office. Special meetings and conferences bring a heavy influx of work to these ladies, who offer advice on the preparation of technical material, then produce it, quite often on difficult time schedules. The Publications Office is also responsible for clearance of publications for patentable matter with the AEC Patent Office.

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SHARE THE PHOTOS

The VILLAGE CRIER encourages employees and other people working at NAL to submit photographs of interesting specimens of nature taken on the NAL site, for possible publication in the CRIER. Submissions should be clearly labeled with the photographer's name, the date the photo was taken, and a brief descriptive caption. Also indicate if the photo must be returned.

It is hoped that interest might lead to a photography contest. Certainly an interesting display could result immediately for the cafeterias. Spring migrations are now at their peak. A lively herd of deer can be seen in the early morning or evening in and around Big Woods. Many other animals, birds, and other natural phenomena on site would make delightful photographic subjects. For further information, contact Margaret Pearson, Ext. 3351.

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NOTES FROM NALWO

NAL's Women's Organization is making arrangements for a Fashion Show to be held in The Village Barn in the next few weeks. Mary Ann Ryk, NALWO Activities Chairman, would like to hear whether women employees of the Laboratory would be interested in attending such an event. If so, she will arrange a time most suitable for employees' schedules. Call her at 968-8651 before April 18 and express your ideas.

NALWO is also seeking nominations for Board members. Positions open are: Chairman, First and Second Vice-Chairmen, Secretary, Treasurer, Activities Group Chairman and Newsletter Editor. Contact members of the Nominating Committee before May 2 to nominate or to volunteer: Janice Roberts, 629-2646 or 840-3560; Darlene Sutter, 357-1538; or Isobel Walker, 469-0209.

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BRING YOUR OWN BASKET!

The annual NALREC Easter Egg Hunt will be held on Saturday, April 14, from 1 to 4 p.m. at the Baseball Field next to The Village Barn. The children (ages 2 to 8 years) of all NAL, DUSAF, AEC, B & H Janitorial Service, and visitors are invited to join the search.

THE EASTER BUNNY will be on hand to pass out goodies! If you have any questions, contact Marilyn Paul, Ext. 3453.

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SPRINGTIME IN THE ROCKIES

The NAL Travel Office, in collaboration with AMTRAK, is offering to NAL employees, visitors and members of their families a five-day trip to Colorado. "Springtime in the Rockies" is from MAY 24 thru MAY 29 and costs only $175.00 per person. Many extras are included in the price. Interested? Call Eric Jarzab at the NAL Travel Office, Ext. 3396.

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SUMMER JOBS

The Laboratory plans to hire a limited number of employees' children again this summer. Candidates should be at least sixteen years of age. Salaries will normally be $1.60 per hour. Typically, positions will be nontechnical in nature. Application forms are available in the Personnel Office, 21 Sauk.

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CLASSIFIED ADS

FOR SALE - 5800 B.T.U. Room Air Conditioner for sliding window - $75.00. Call Fred Cload, Ext. 3428 or 968-6551.

FOR SALE - Tan Toy Poodle Puppies, ready for Easter - $50.00 each. Call Fred Cload, Ext. 3428 or 968-6551.

FOR SALE - 1966 Chevy Impala, 2 barrel carb., 283 engine. Power steering, radio, new brakes. $400. Call Bob Hilliard, Ext. 3555 or 897-9038.

INSTRUCTION - Let's Go Flying - for instruction call Stan, 357-3546 after 5 p.m.

FOR SALE - One pair of Deluxe Champion Rayon belted tires, G-78-15 (like new) - $30.00. Call Richard Biwer, Ext. 3728 or 969-7543.

FOR SALE - General Electric Thinline Air Conditioner, 2-speed cooling, temperature control, separate fan control - 6200 B.T.U. @ 115 volts A.C. - $60.00. Call Richard Biwer, Ext. 3728.

FOR SALE - Bow, 46-pound pull, 9 target arrows, 6 field arrows, 1 fishing arrow, and quiver - $65.00. Call Betty Kastner, Ext. 3531 or 3593 after 1:30 p.m.

LOST - Miranda Sensorex SLR camera in Village Barn, March 30, 1973. Call Bob Flora, Ext. 3701.

APARTMENT TO SUBLEASE - 2 bdrms., 2 f/baths, shag carpet, very lge. rms. Air conditioner & swimming pool use included. Call Johnny Green, Ext. 3786 or 851-6258.

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