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NAL FILM ANALYSIS FACILITY LOOKS FOR SUB-ATOMIC "CLUES"

(This is the first of two articles concerning NAL's recently-organized Film Analysis Facility. It was written with the assistance of Ray Hanft, Physics Research; Ernest Malamud, Main Ring; Richard Mobley, Beam Targetry; and Roland Juhala, Booster.)

Some of the most significant and enigmatic mysteries of our time are being viewed almost daily on motion picture film by men and women at NAL who are looking for "clues" that may help unravel nuclear "events." In a white pole building at the northeastern edge of NAL's Village, at 34 Shabbona, is centered the Laboratory's Film Analysis Facility (FAF). There are few like it in the world.

Five young women sit quietly at unique tables for long periods, from 8:30 a.m. to 5 p.m. daily, and another joins them at 4 p.m. to work until midnight. All are engaged in "scanning" -- an esoteric, but vital occupation peculiar to elementary particle physics. They are "scanning" films in a search for sub-atomic "incidents" recorded on special photographic equipment at bubble chambers at various physics research laboratories across the nation. Soon, they will be "scanning" such film resulting from complex experiments to be conducted with the assistance of NAL's accelerator system.



...Several members of NAL's film scanning group: (L to R) Ray Hanft, Carol Long, Judy Dill, Dawn Chartrand, and Christine Dedin. Seated is Annette Albano...

Photo by Tony Frelø, NAL

The Film Analysis Facility group works in an atmosphere of sleek austerity, a sleekness that is incongruous when one learns about the complexity of the work being undertaken there. The facilities are new, with construction still going on. Physicists directing the effort sit in small, cubicle-like offices with their desks piled high with computer printouts which they handle like a housewife hoarding recipe cards. They shuffle through their 10-foot-long cards until they find the right combination for the "dish" they currently are cooking up for their intellectual diets.

Many methods are used for recording scientific data from high energy physics experiments. Optical spark chambers and bubble chambers use photographic film to record the capricious trajectories of charged particles. In optical spark chambers, the charged particles produce sparks along their trajectories. In bubble chambers, they produce bubbles along their trajectories. From scanning the photographs of a given particle trajectory from two or more different directions, it is possible to determine the angles and curvature in space of the trajectory.

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Parenthetically, it might be noted that a liquid detector that grew out of watching bubbles form in a glass of beer led to a Nobel Prize in physics in 1960. Donald A. Glaser, an American physicist, pointed out in 1952 that bubbles will form along the track of a charged particle that has passed through a superheated liquid. The high density of the liquid makes it far superior to the old-fashioned cloud chambers that exhibited jet-like vapor trails for lazy, slow particles but were inefficient for tracking the kangaroo-like trail of super-energetic radiation.

At NAL's FAF, bubble chamber film is checked by the "scanners," who carefully review each set of photographs to see if the "events" they discover are "interesting" as defined by physicists who conducted the experiments. (Note: A new elementary particle of matter, the omega meson, predicted for several years on theoretical grounds, was found only after 30,000 photographs had been analyzed at the Lawrence Radiation Laboratory in 1961.) When interesting events are found, information about the trajectories is recorded in digital form suitable for computer analysis.

"Scanners" use manually-operated film editing equipment specially designed for their work. NAL already has purchased some such equipment; other items have been loaned by Lawrence Radiation Laboratory at Berkeley, Calif., Brookhaven National Laboratory, New York, and Yale University, Connecticut. The degree of success depends, of course, on the skill, judgment, long-range experience and briefings provided the "scanners."

One principal project at FAF now is the development of an "Automatic Measuring Facility" for NAL. The automatic facility will be capable of increasing the rate of scanning and measuring with the aid of semi-automatic control supplied by the DEC PDP-10 computer located in the FAF building.

The general complexity of some events, however, precludes the possibility of a fully automatic operation. Hence, in cases where the complexity of the event is beyond the analysis capabilities of the recognition programs in the PDP-10, an operator will be asked to provide objective aid. The net result should be to increase the measuring capability of a single operator by a factor of ten or more.

Design of NAL's "Automatic Measuring Facility" began about a year ago, and construction is now underway. First measurements using the automatic device is projected for late 1971 or early 1972, corresponding with the anticipated appearance of the first bubble chamber data from NAL. Physicists associated with this project include Virgil D. Bogert and Raymond Hanft; engineering design work is being done by James DeShong and Robert Cavanaugh. Bruce T. Chrisman and Glenn C. Johnson are working on computer programs for the PDP-10. Technical support for all aspects of FAF is provided by Richard J. Bingham, Delwyn Burandt, Carlos Cangemi, Curtis R. Danner, and Martin Glass. All are members of the NAL Physics Research group.

RIDING CLUB TO HOLD MEETING MAY 27

The Indian Creek Riding Club has received an authorized license to operate on the NAL site. Dues are \$5 per month for members and their immediate families plus a donation of eight hours a month in labor to help get the program underway. A fee of \$45 per month will be charged for boarding horses.

Riding Club co-chairmen for this year are: Mrs. Sandra (Sammy) Rumble, Public Information; Carlos M. Velasquez, Beam Transfer; Jack Riffle, Receiving. Gerry Reid, Plant Modification, is secretary, and Bernie Lensmeyer, Cafeteria, is treasurer.

The Club will meet Thursday, May 27, at 5:15 p.m. in the Village Barn. The Club is open to interested persons employed by NAL. All are invited to attend. At the May 27 meeting, questions concerning construction at the new facility, possession, rental, boarding and other related questions will be answered. Refreshments will be available. Gerry Reid will present plans for a "Trail Ride" in early June.

570 TESTED IN 3-WEEK HEART STUDY AT NAL

"I am really impressed by the enthusiasm of the people at NAL for their work. They don't come in for their tests and just hang around to get away from their jobs as we have seen people do at other places where we have conducted our program."

So observed Miss Karen Strentz of Harwood Heights, a member of the four-nurse Chicago Heart Association team which was assigned to the NAL Village for three weeks to test employees for coronary heart disease, susceptibility to coronary heart disease, and diabetes.

The nurses concluded their tests of 570 NAL, DUSAF and AEC employees Thursday evening, May 13. The basement of the two-story building at 21 Sauk was their "laboratory".

During their tests, the nurses used 24 cases of dextrose; and 650 needles for drawing blood. One of the nurses drove 100.5 miles per day to get to and from her job. She resides on Chicago's Far South Side.

At the conclusion of their tests at NAL, a tour of the site was arranged for the group.

The other nurses were Miss Joan Ellen Johnson, of Chicago; Mrs. Virginia Ruth Kruse, of Norridge; and Miss Suzanne Ward, of Harwood Heights.

Results of the examinations will be sent in confidential reports to the employee and to his personal physician in about five weeks.

Said Charles F. Marofske, NAL Personnel Manager, "This was an unusual opportunity to provide a meaningful preventive health program to NAL personnel. The record turnout provided dramatic evidence that our employees are concerned about maintaining good health. I would like to thank the Chicago Heart Association and its nursing staff for their assistance in this program. In addition, NAL's two nurses, Mrs. Dorothy Poll and Miss Glenys Smith, spent many hours in scheduling and assisting the program."



...Chicago Heart Assn. nurses visit Central Laboratory site. (L to R) Suzanne Ward, Karen Strentz, Glenys Smith (NAL), Joan Johnson, and Virginia Kruse...

Photo by Fran Pisarek, NAL

BLOOD DONOR APPEAL

A request has been made for donations of three pints of blood to replace blood given to William Murphy, an employee of Belding Engineering Co., West Chicago. Murphy was injured April 25 while working at the "Wonder Building" on the NAL site. He is a patient at the Geneva Community Hospital. Possible donors should call the Aurora Blood Bank, 516 S. Lincoln St., Aurora. An appointment is suggested.

MARK YOUR CALENDAR: First NAL softball doubleheader in NAL Village Tuesday, May 25, starting at 5:30 p.m. Beam Transfer vs. Machine Shop. Main Ring vs. Personnel.

CANOES: An open-calendar basis for reserving NAL canoes on a "first come, first served" basis has been established by the Personnel office. In addition, no employee will be permitted to sign up for more than one canoe for any given date. Until recently, Personnel has followed an informal practice of not accepting reservations for canoes until Monday for the following weekend. This has caused inconvenience to individuals who plan weekend excursions involving canoeing considerably in advance of the actual date. Hence, the new policy has been established. If you have any questions, please call Ext. 397.

COURT DANCE: The Racket Court Dance for NAL employees will be held in the Village Barn Friday, May 21, from 9 p.m. to 1 a.m., with music by "The Sons". Cash bar, potato chips, pretzels.

NALWO CALENDAR: The Gourmet group is planning a Spanish dinner for their next meeting. It will be on Saturday, June 5, at 7:30 p.m. For reservations call Mary Ann Ryk, 968-8651....The Sewing group meets on Thursdays. For further information, call Greta, 232-0185....The Annual June Tea will be held on Tuesday, June 8, at 1:00 p.m. at the home of Mrs. Robert R. Wilson.

NIU SYMPOSIUM SCHEDULED FOR MAY 20, 21, 22; "BLACK DANCE" GROUP AT ELGIN

NAL's EEO staff notes that NAL, AEC and DUSAF employees are invited to attend a three-day symposium sponsored by Northern Illinois University's Center for Black Studies at DeKalb May 20, 21, and 22. LeRoi Jones, poet, will speak on the "Black Cultural Revolution" May 20 in the NIU's Fieldhouse. All-Black "Dance Theatre of Harlem" performs in Elgin May 21. For details, call EEO group, Ext. 415.

CLASSIFIED ADS: (DEADLINE: FRIDAY NOON)

FOR SALE:

'64 Pontiac Catalina, P.S., P.B., Auto, 2 Dr. Hdtp., \$200; '59 Oldsmobile Super 88, P.S. P.B. Auto., \$150. Good second cars. Call Jean, Ext. 467.

Reg. 3/4 Arabian Grey 3 yr.old filly 14'3" greenbroke beautiful style - \$700; Reg. 3/4 Arabian Palomino/Grey filly foaled 4/3/71, excl. head, type y-\$500; Reg. Saddle-bred mare, Bay, 5 yr.old in foal to Reg. Arabian Stallion, due June 5, '71-\$800.C.Koss 231-4893.

Complete amat. radio set with all equipment needed go on air: Drake R-4 receiver, Knight T-60 tran./key, ten 40-meter crystals (7.156-7.196), switch. spkr., coax-connectors, 40 meter di. antenna, 50 coax ant. lead-in. \$300. Call Fred after 5, 584-5138.

Lake Front Dutch Colonial Home - LAKE GENEVA - 3 br., 2-car gar., pvt.pier, exc. location Williams Bay, \$60,000. Will Show.....18-ft. Carver boat/cabin - 40 HP Motor & Trailer, extras. \$750. Olsen, Ext. 324 or 668-4942.

Three apricot toy poodles, 1 male, 2 females, Call Darrell Ext. 575 or 851-5360.

Dark Brn. Wig, short, natural side part, 1 yr. old, worn 5 times. \$20 (Orig. \$40). Shampoo included. Call Sue, Ext. 531.

24' diameter x 4', Muskin swimming pool with raised redwood patio; 1/2 HP filter, ladders & accessories. \$175 complete. James Simanton, Ext. 541.

130,000 BTU oil-fired forced air furnace, blower, motor, controls, tank, thermostat. Working order. \$50 your pick up. Call George M. Ext. 266.

'64 MGB Call Lois, 858-2800, Ext. 208 or 469-8912 after 5 p.m.

'68 Opel, good condition \$750. L. Klaisner, Ext. 467 or 969-3718.

R. F. Signal Gen. 6 bands up to 260 MC, 400 cycle Int. Mod. \$25. Call Mack, Ext. 259.

'69 Ford pickup & camper/F 250, 390 V-8, camper special, 4 spd., p.s., p.b., air, reserve gas, 2 wheels/snow tires. Goldline Fiberglass Camper. Sleeps 5. With Brody camper jacks. Call H. Clover, Ext. 295.

Bear "Grizzly" bow, 45 lbs. with case. Exc. condition. 12 field arrows & quiver never used. All for \$50. Call D. Wastel, Ext. 229.

FOR RENT: Modern, lg. 1 br. apt. within 8 min. drive. \$160 per month incl. utilities, heat & gas. Call 851-5850.

GIVE AWAY: 3 kittens, trained. 968-4950.

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