



NAVY VESSELS ON NEW DUTY AT FERMILAB



...U.S.S. BALTIMORE, bow view...



...Unloading armor plate at Fermilab...

It is an old seafaring tradition that on a night when the moon is dim and the mists rise off the sea, if you listen carefully and look sharp, you may hear the tolling of a ship's bell and see a ghostly vessel sailing above the spot where a sunken ship lies. And you may see the spectral form of the Captain restlessly pacing an ephemeral quarter deck. If the old tradition holds, an experimenter working the owl shift in the experimental lines at Fermilab may, through the prairie fogs, see phantom ships of the U.S. Navy line -- *Wasp*, *Philippine Sea*, or *Baltimore*, just to name a few. The valuable metals once built into tools of war now serve the future of the world in peaceful basic research at Fermilab. The swords of the Navy's battle fleet have become the plowshares of nuclear research.

The very large number of protons accelerated to unprecedented energies in the Fermilab accelerator system produce, besides the particles desired for a particular experiment, large numbers of other background particles which obscure the effects to be observed in experiments. To filter out these unwanted particles, large quantities of high density material are required between the point where the protons from the accelerator strike their target and the delicate experimental apparatus.

Several things were considered to achieve the separation of extraneous from essential particles: a graveyard of used automobiles, slag ore from steel mills, soil mounds. Soil is used extensively in the Meson and Neutrino experimental areas. Steel, though, is often much better. Casting about for an inexpensive source of the huge quantities of steel needed at the Laboratory, a cooperative arrangement was developed with the U.S. Navy to acquire the heavy armor plate from retired fighting ships and the lead ballast from submarines when such ships are dismantled. The armor plate of some 18 Navy ships -- ten heavy cruisers, five aircraft carriers and three submarines -- now serves the experimental areas at Fermilab.

The Laboratory is notified by the Energy Research and Development Administration (ERDA) when ships are declared surplus by the Navy. Armor that could be useful to Fermilab is requisitioned by the Fermilab Research Division and ERDA then requests that this steel be reserved for the Laboratory's needs.

The hull of a naval vessel contains sheets of armor plate, typically 8' x 10' and 3½" to 6" thick, weighing at least four tons each. (Much research in the manufacture of steel has been instigated by the navies of the world in the 115 years since the change from wooden to armored ship hulls.) The armor plates are delivered to Fermilab by either rail or truck.

NAVY VESSELS AT FERMILAB



...U.S.S. PRINCETON on active duty...



...U.S.S. FALL RIVER plate at Fermilab...

Trenches are excavated on the beam line, and the plates are then laid flat, by special riggers, in piles surrounding the beam pipes on the Proton Line. The number and dimensions of the plates are carefully recorded so that effectiveness of the shielding can be calculated.

The Laboratory has received about 3,000 tons of such armor plate thus far. Another 2,000 tons is on order. A cruiser typically yields 200 tons, an aircraft carrier, 600 tons. Shipments are made in lots large enough to be economical. Transportation of the steel costs \$53 a ton, limiting the amount the Laboratory can reasonably procure each fiscal year. Fermilab would potentially utilize as much as 100,000 tons if accelerator energy were increased to 1,000 BeV.

The vessels now at rest at Fermilab played important roles in U.S. history. The cruiser *Baltimore*, for example, served a major role in the Pacific theater in the early part of World War II. In July, 1944, *Baltimore* carried President Roosevelt to a meeting with Admiral Nimitz and General McArthur at Pearl Harbor. In peaceful times, *Baltimore* represented the U.S. Navy in the Coronation Naval Review in Spithead, England in 1953. The ship was decommissioned in May, 1956; her armor plate arrived for use at Fermilab in April, 1973.

Two other ships of the "Baltimore class" -- *Fall River* and *Macon* -- have also come to Fermilab. *Fall River* arrived in August, 1974, and 376 long tons of its steel were promptly lowered into the Fermilab P-E line. *Fall River* was in the Marshall Islands in 1946 as flagship for the "Operations Crossroads" atomic weapons tests. The ship was placed out of commission in October, 1947, in the Puget Sound Navy Yard. *Macon* accommodated many training cruises for midshipmen, as well as launching the first test of a Regulus Missile. *Macon's* crew is also credited with saving the lives of merchantmen when their vessel burned in the Atlantic in 1959. One Naval historian notes, "There can be little doubt that at the time of their completion, the 'Baltimore class' were the finest example of their class for ocean warfare, and no vessels short of capital rank could contain them."

Five former aircraft carriers of the "Essex class" now belong to the Fermilab "fleet": *U.S.S. Antietam*, *Bunker Hill*, *Lake Champlain*, *Philippine Sea* and *Princeton*. *Antietam* was the first aircraft carrier to be fitted with a revolutionary angled deck for aircraft operation. *Bunker Hill* and *Princeton* were active in World War II Pacific theater action. *Lake Champlain* served in the Korean War, as did *Philippine Sea*. These ships carried a war-time complement in excess of 3,500 officers and men.

Fermilab experimental lines now also contain parts of two light cruisers of the "Worcester class" -- *Worcester* and *Roanoke*. The two ships were known for their keen defense against air attack coupled with potential for heavy volume of fire power in surface action.

Buried deep in the Fermilab particle research facilities, the massive remains of the ships in a sense still carry on the Naval tradition by participating in another important phase of American history.

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...Minerva Sanders, Administrative Officer at ERDA's Fermilab office, was recently presented a Special Achievement Award for her work as coordinator of the Chicago Operations Office Women's Program. Minerva received the award at a five-day EEO Awareness Week seminar in Washington D.C. Her citation refers to the outstanding features and results of the year-long program and notes Ms. Sanders' "real interest, dedication, and extraordinary leadership in initiating and achieving" the program.

Robert Bauer (R), manager of the ERDA-COO, congratulates Minerva on her award...

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LOOKING BACK ON THE 380 BeV RUN

The Fermilab accelerator completed a highly successful run at 380 BeV on the morning of March 17, providing extra high energy protons for Experiment 87A in the Proton Area and for Experiment 370 in the Neutrino Area. The accelerator ran smoothly and at good intensities, making it possible for these important experiments to achieve their goals.

There have been several short runs at energies above 300 BeV. These runs have always been accompanied by shake down problems in the Main Ring, the Main Ring magnet power supply, and the electrical feeder cables that bring power from the Substation to the Main Ring. The greater stresses in these components at higher energy caused them to break down more frequently, at approximately twice their normal rate.

This time, the energy of 380 BeV was chosen in collaboration with the experimenters to not tax the power rating of the feeder cables. It also gave an extra margin of redundancy in the number of magnet power supplies in use, which helped reliability. The power supplies and Main Ring magnets systems operated through the run with their normal 300 BeV performance. There were no failures in feeder cables. As a whole, the accelerator operated as well as it usually does at 300 BeV.

Speaking on behalf of the experimenters in Experiment 87A in the Proton Area, John Peoples reports that the experiment collected much good data in which the experimenters hope to uncover significant new findings. "The 380 BeV run added a new dimension to Experiment 87A, permitting us to observe the interactions of photons of the highest energy ever achieved in an accelerator," he said.

When the repaired transformer is installed in the Master Substation and starts operation, it is expected that this same performance can be expected at even higher energies.

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FERMILAB BUFFALO RECOVER FROM SALMONELLOSIS

The Fermilab buffalo herd has suffered an outbreak of Salmonellosis which has resulted in the loss of 8 animals from the herd of 36 since January 1st. This disease was triggered by a rise in the worm infestation common to this animal in confinement. The herd is under local treatment at the Illinois Equine Clinic in Naperville. In addition, Dr. H. M. Amstutz, of Purdue University, a nationally-recognized authority on bovine cattle has been a consultant.

Remedial measures for treatment of this condition include correction of feeding operations, especially those of young animals. Buffalo follow a rigid pecking order which prevents some of the older, the weaker, and the younger animals from getting proper amounts of food. Because they hold fast to their inherent herd instinct it is not possible to feed the animals individually.

The Fermilab herd had grown from the initial group which included five brought from Longmont, Colorado, in 1969; the Head Bull, "Oh Boy," from Cheyenne, Wyoming, the same year; and eleven from Illinois State Fair Grounds in 1970. Many of the deceased animals were from the older Illinois herd.

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JOHN HOLT SPEAKS AT FERMILAB

John Holt, educator, author, and friend of children, will speak in the Fermilab Auditorium on Thursday, April 10, at 7:30 p.m. under the auspices of the Tri-City Youth Project. John Holt has taught elementary school children and Harvard graduate students. He is the author of several books that have become classics in the field of education. Among these are *How Children Learn*, *How Children Fail*, *The Underachieving School*, *What Do I Do Monday? and Freedom and Beyond*.

His topic at his Fermilab appearance will be "The Needs and Rights of Children" and he will focus on the human rights of kids -- educational, social, legal, and medical.

Tickets are available at the Tri City Youth Project Office, 321 Hamilton Street, Geneva, at \$2.50 per ticket. Tickets may be purchased by mail, enclosing payment and self-addressed envelope.

FOUR MORE WOMEN ENTRIES NEEDED...for Women's Division of Ping Pong Tournament, opening April 7. Call John Satti, Ext. 3676, or John Elias, Ext. 4135 before April 3 to sign up.

THIS WEEK AT FERMILAB...International Folk Dancing meets Friday, April 4, at 8 p.m., Village Barn, everyone welcome...Cocktail hour at Users Center, Friday, April 4, 5-7 p.m., reduced prices...Last week for Ken Chaney Experience tickets (Saturday, April 5). Tickets at \$3.00 in advance; \$4.00 at door.

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CLASSIFIED ADS

FOR SALE - 1967 Ford Mustang, 2 dr., 3 spd., complete new brake system, good cond. \$350 firm. Call 892-7123 after 6 p.m.

FOR SALE - 6½' green & gold patterned Sofa. We need the room - a \$30 bargain. Call Don Rohde at 896-4175 anytime between 10 a.m. and midnight.

FOR SALE - 1974 Skamper Royal fold down camper. Sleeps 6, w/porta-potti, 35,000 BTU furnace, 3-way refrig., more. Like new, used 4 times. \$2200 or offer. Ed Curl 815-698-2304.

FOR SALE - 1971 Harley Davidson Motorcycle, 350 cc; \$500 or best offer. Call Shirley, X3405.

FOR SALE - 8' Truck Cap--\$145. Call Don Tokarz, 279-8843.

FOR SALE - Kodak pocket carousel slide projector, model 200, brand new, retail \$139.50, will sell for \$65.00 Don Mendenhall, Ext. 3724 or 896-9308.

FREE - 3 black kittens, free to good home, 7 wks. old. Call Sue, Ext. 3222.

FOR SALE - 1971 Honda 350 cc. good cond., needs work on starter. \$500 or best offer. Call Don 879-2682 after 5 p.m.

FOR SALE - 1973 Ford Country Squire Station Wagon, 400 C.I.D. engine, radial tires, new shocks. Call Bruce Strauss, Ext. 3671, 964-4018.

FOR SALE - 1971 BSA Victor 500, good cond., \$500 or offer. Call Roger, 665-0958 after 5 p.m. 1963 Galaxie 500 Eng. & body in good cond., \$125. or offer. Call Roger, 665-0958 after 5 p.m.

RECEIVE FOREIGN MAIL? - Please save the stamps for Graciela C. Finstrom, CL-6W.

FOR SALE - 36,000 BTU gas fan forced space heater. \$65. Gas refrigerator \$10. A. Oleck, X3769.

FOR SALE - 1972 Harley Davidson 350 cc on & off road use, less than 2000 mi. \$500 or offer. Madallion Marauder tires & wheels G-60x14, \$200, less than 1000 mi. Any other parts from a wrecked 69 Roadrunner. D. Maxwell, Ext. 3734, 892-8618.

WANTED - Leather motorcycle jacket. Medium. Contact Terry Hendricks, Ext. 3721 or SH1-0916.

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