

## Tree ring tales of pollution

A Pennsylvania State University professor has found a way to chronicle air pollution by testing samples taken from tree rings, by adapting a sophisticated material analysis technique sometimes used to track down criminals from a strand of hair or a trace of gunpowder residues. Nuclear engineer K.K.S. Pillay says that trees may now yield year-by-year information on concentrations of specific atmospheric pollutants, and possibly their sources.

Width of tree rings has long been used as an almanac of annual rainfall, but in the new technique, material taken from a ring is subjected to neutron bombardment and the pattern of resulting gamma rays is analyzed to see what trace elements are present. Pillay often uses this technique, called neutron activation analysis, when he is called as an expert witness in criminal cases involving firearms. (He was the first to discover that a bullet's trajectory can be traced from the trail of residues beneath its path.)

So far, Pillay has collected data on some 30 elements from various trees around the university campus, and has correlated profiles for mercury, silver and iron against past history of industrial activity in the area. Silver, for example, shows a rise from about 1953 that peaks around 1960—corresponding to the chronology of cloud seeding with silver iodide crystals. Mercury levels also began to rise in the 1950's, which again corresponds to increased industrial use. From a period further in the past, Pillay discovered a distinct falloff of iron in tree rings during the first decade of the 20th century, during a time when iron furnaces were being phased out in central Pennsylvania.

Though the correlations remain speculative, Pillay is hopeful that his new technique can be used to build a "fund of information on the worldwide accumulation, migration and retention of trace elements," leading to an objective evaluation of where pollutants go and how many are retained in the ecosystem. First, however, more information must be gathered on how they are metabolized by different trees.

## Waste: A progress report

In a report to Congress, the Environmental Protection Agency says that solid wastes increased eight percent between 1971 and 1973, at which time only seven percent (except old cars) was being recycled. Some 21 percent of the total paper and board consumption was recycled, but this amount could easily have been doubled if wastepaper had been separated beforehand.

The report concluded that although 70 to 80 percent of the trash is convertible to energy, only 10 percent of the potential will be realized by 1980. By then, some 30 cities and counties should be recovering the equivalent of 40,000 barrels of oil a day. Ways were also suggested to reduce the amount of waste in the first place: Redesigning milk containers could reduce paper use by 31 percent and redesigning "tin" cans could reduce steel use 25 to 30 percent.

## Against plastic pop bottles

Constituents of plastic pop bottles, now undergoing test marketing, can migrate into the beverage in measurable quantities and the company manufacturing the bottles won't release relevant information concerning the long term effects of this contamination, charges Deborah Baldwin in the Nov. 22 ENVIRONMENTAL ACTION. The bottles are manufactured of acrylonitrile monomer by Monsanto for the Coca-Cola Company, and they may contaminate a beverage above legal levels after 65 days at 120 degrees F., according to tests by the Natural Resources Defense Council, cited by Baldwin.

DECEMBER 6, 1975

## A swipe at SALT

In a strongly worded and widely quoted editorial, Robert Hotz, editor-in-chief of AVIATION WEEK AND SPACE TECHNOLOGY, says that the six years of Strategic Arms Limitation Talks (SALT) have "vastly improved the Soviets' military position," and that if current trends continue, the United States will take a military position of "painful inferiority."

The editorial, in the magazine's Nov. 24 issue, is one of the sharpest attacks on SALT to originate from the technical community and is unprecedentedly blunt in its accusations of "legal and technical incompetence" among U.S. negotiators and "deception" by the Administration. The net effect of the talks so far, Hotz says, has been to freeze weapons development in the United States, while allowing it to continue in the Soviet Union.

Among specific examples of curtailment he cites are Congressional moves to delay flight testing of the Maneuvering Reentry Vehicle (MARV), prohibit testing of the cruise missile, and shut down the country's one existing antiballistic missile system complex, in North Dakota.

## AID to women

In response to Congressional mandate and in recognition of the International Women's Year, the State Department's Agency for International Development (AID) is concentrating on ways to improve women's participation in its technical and social projects. Various recent AID publications outline the efforts.

Though legal and social barriers to women's equality are generally falling around the world, lack of education and access to credit still hold many women back from participation in a technical society. In the 42 nations where annual per capita income is less than \$500, women work largely outside the money economy. Half a billion women make up 60 percent of the world's illiterate adults.

The agency is responding in a variety of ways. More women are being brought to the United States for training—13.1 percent of such trainees in the first half of 1975 were women, compared to only 4.5 percent two years earlier. Others are receiving training in their own countries—as paramedics in Guatemala, as midwives in Afghanistan, as family planning instructors in Pakistan (where such services now reach 75 percent of the population, according to AID). In other areas, trading cooperatives and credit institutions aimed at women are helping make new markets available for their crafts and produce. A by-product of the work is new statistics showing the importance of women to the work force of many developing countries.

## Engineers' employment problems

John Alden, executive secretary of the Engineering Manpower Commission (EMC) of the Engineers Joint Council, reviews the latest job statistics in the November NEW ENGINEER. The article title, "The Bottom Falls Out," tells it all.

Overall unemployment for engineers, as compiled by the Bureau of Labor Statistics (which does not limit the designation to *graduate* engineers), rose from 0.9 percent in 1974 to 3.0 percent this year. As for new graduates seeking their first job, the market was "in many ways as depressed as in 1971-72, with its massive aerospace layoffs," writes Alden. The proportion of graduates without job offers or other plans rose to 12 percent, highest since EMC started taking data.

Petroleum engineers were most successful in getting jobs; industrial, civil and architectural engineers were hardest hit. Lowest starting salary was for civil engineers, \$12,888—still \$1,836 above nontechnical grads.

359