

Super-Trains Planned For Italy by 1969

► PLANS for the biggest speed-up on the Italian State Railways since Mussolini insisted on punctuality have now been approved by the railroad directorate, calling for speeds of up to 112 miles per hour.

The first routes to benefit from the modernization will be: Milan to the Port of Genoa, Milan to Chiasso on the Swiss frontier, and Milan to Bologna.

In many cases the faster trains will cut traveling time by half or more. At present, even an Italian super-express (rapido) takes about an hour and a half to cover the 96 miles between Milan and Genoa. The more frequent normal expresses (direttissimi) take about two and a half hours. Under the modernization plan, full speed all the way would cut the Genoa journey down to 51 minutes.

The \$20 million allotted for the scheme does not seem a great deal, but the system is already fully electrified. The main expense will be conversions to fully automatic signaling, elimination of a number of level crossings, and additional tracks in some cases. Work is expected to start by the end of this year, and to be completed by 1969.

The Bologna plant of AMF SASIB (American Machine and Foundry Company's manufacturing subsidiary in Italy) has just received a five million dollar order from Italian Railways for automatic block and automatic level-crossing controls along the 128-mile Milan-Bologna route, and automatic interlocking signal control systems for 18 en route stations.

GEOPHYSICS

No Halo of Dust Surrounds the Earth

► EARTH has no dust halo.

The accepted belief that our planet is surrounded by a halo of dust is based on counts of space particles hitting orbiting man-made satellites as recorded by sensitive microphones.

Temperature changes could cause the microphones to record sounds that should have been made by particles from space, but actually were not. This is the conclusion of Dr. Carl Nilsson at Goddard Space Flight Center, Greenbelt, Md., who tested in his NASA laboratory the way that the microphones used in satellites react to temperature changes.

His experiments cast "considerable doubt" on how effectively a satellite's microphone records real micrometeoroids. The conclusion from the laboratory tests were confirmed by the microphone in OGO-II, or Orbiting Geophysical Observatory II.

The microphone in this satellite was shielded in such a way that any signals it might record would clearly be from micrometeoroids. Data from more than 100 hours of flight have been analyzed so far. "No detectable signal" that could have been caused by micrometeoroids has yet been recorded on OGO-II, Dr. Nilsson has found.

He suggested that satellite microphone measurements should not be used to support the theory that a concentration of dust particles is making a halo surrounding earth. Dr. Nilsson also pointed out that no satisfactory explanation has yet been made to explain how or why earth should have a dust halo.

MEDICINE

Color Blindness Genes Not Basis for Cirrhosis

► ALCOHOLICS with cirrhosis of the liver are often color blind, but doubt has now been cast on the theory that the X-linked genes causing color blindness predispose the person to cirrhosis and to alcoholism.

Forty-six alcoholics with Laennec's cirrhosis, a wasting liver disease, were studied for color-vision defects by three physicians from the State of Washington.

Eleven of the 24 males, or 46%, and nine of the 22 females, or 41%, were scored as color defective. One man had a rare severe defect in blue-yellow perception called, tritanopia, and the remaining 19 defective patients showed abnormal responses in red-green perception.

A previous report in *The Lancet* 1:1131, 1965, by Dr. R. Cruz-Coke concluded that the color-vision defects were not secondary to the cirrhosis, but probably were inherited as sex-linked traits that predisposed the subjects to the cirrhosis or the alcoholism.

The Washington researchers said the "majority of color-vision defects in alcoholic patients with cirrhosis could reasonably be said to be secondary to the cirrhosis or to the alcoholism." The data available "do not support the suggestion that X-linked genes for defective color-vision predispose either to alcoholism or to cirrhosis of the liver."

The most direct explanation of color blindness in alcoholics with cirrhosis is that the impaired mental status and poor attention span of such persons interfere with color-vision perception at least in a testing situation, they stated.

Dr. Philip J. Fialkow of the division of medical genetics, University of Washington School of Medicine, Seattle; Dr. Horace C. Thuline, research director, Rainier School, Buckley, Wash., and Dr. L. Frederick Fenster of the University of Washington School of Medicine and King County Hospital reported the findings in the *New England Journal of Medicine*, 275:584, 1966.

IN SCIENCE

PUBLIC HEALTH

Purity Standards Listed For 500 Food Additives

► STANDARDS of purity for more than 500 food additives now in common use are defined in a new publication called *Food Chemicals Codex*.

The Codex will provide chemical manufacturers and food processors with uniform specifications comparable to those that have long been available for drugs through the U.S. Pharmacopeia and the National Formulary.

The Food and Drug Administration will use specifications in the book to define the "appropriate food grade" of chemicals as specified in sections of the Food Additive Amendment to the Food, Drug, and Cosmetic Act of 1938, Commissioner James L. Goddard said.

The 832-page book is available for \$25.00 from the National Academy of Sciences-National Research Council Printing and Publishing Office, 2101 Constitution Ave., N.W., Washington, D.C.

Among the many classes of food additives covered in the Codex, which is the culmination of a five-year effort, are flavoring agents, preservatives, antioxidants, nutrient supplements, stabilizing agents and others.

New ways of measuring purity have had to be developed especially for the Codex, as the specifications are in most instances more rigid and more definitive than those published in the Pharmacopeia and National Formulary.

Scientists from Government, industry, universities and private research organizations have cooperated in preparing this first edition of the Codex. Specifications for the book were prepared by a committee under the chairmanship of Henry Fischbach, director of the division of food chemistry in the FDA's Bureau of Scientific Research. Chairman of the 21-member advisory panel was R. Blackwell Smith, president of the Medical College of Virginia, Richmond.

Funds for the project were provided by the U.S. Public Health Service, supplemented by grants from more than 100 organizations involved in the manufacture of food chemicals.

The need for an authoritative book of standards for food chemicals that would promote greater uniformity of quality and thus provide added assurance of safety has long been recognized, the Committee stated in a preface to the Codex.

Requirements previously set by the Government for food chemicals have not always been sufficiently detailed to serve as procurement and release specifications for industry.

E FIELDS

TECHNOLOGY

Fully Automated Flight Predicted in 10 years

► **WITHIN** the next 10 years all U.S. airplanes will be navigated by a master ground-based computer linked by radio to an airborne automatic control system during flight in controlled air space, A. R. Applegarth of the Advanced Scientific Planning of National Aeronautical Corporation, predicted.

He also forecast that the ground-based computer will be automatically watched by an independent collision avoidance system which will override the computer control if an impending collision is detected and restore control to the computer after the danger has passed.

Communications between aircraft and the ground will include ties to regular telephone services and that such voice communications as may be needed for air traffic control will also be conducted via this link, he believes.

"The basic technology to fulfill these predictions is within today's state of knowledge," Applegarth said. "What remains is hard engineering effort to reduce this knowledge to practical performance, service and costs."

Mr. Applegarth is one of the founders of National Aeronautical Corporation, and as its chief designer has played a key role in development of a good share of the communication and navigation equipment in use in general aviation, it was pointed out in introductory remarks at the convention delivered by Dr. Dayle N. Crabb, President of the Association.

TECHNOLOGY

Asphalt May Help Relieve Food Shortage

► **THE FOOD SHORTAGE** that is rapidly approaching ominous and worldwide proportions may be relieved by thin layers of asphalt, placed two feet below the surface in sandy soil.

The asphalt layers, laid down by soil scientists from Michigan State University and the American Oil Company, keep water from seeping down through the sand and getting lost somewhere deep underground. Moisture is held where crop roots can use it.

Development of the asphalt barriers, and the machinery to lay them underground, was announced by Dr. P. C. White, vice president of research and development of American Oil, and Prof. Clarence M. Hansen, of the

Michigan State department of agricultural engineering.

Dr. White and Professor Hansen said the barriers had been tested on two Michigan farms during the 1965 and 1966 growing seasons, and that results indicate the technique holds forth a dual promise:

Use of underground barriers will permit cultivation of millions of acres of land not now suited to agriculture because it is too porous, or "droughty," to hold the water it receives.

Professor Hansen estimates that the use of asphalt barriers could reclaim 10 million acres of droughty, sandy soils in Michigan alone.

The method has great potential for use in many other parts of the world, he adds, especially in coastal plains areas—such as the east coast of the United States—where sand is deep and dry, and the climate is humid.

The barriers also result in significant increases in crop yields.

In one test plot on a farm near South Haven, Michigan, cucumbers grown over an asphalt barrier had a 100 per cent greater yield than those in a nearby control plot that had been irrigated. Two weeks later, after two good rains, the yield from the asphalt plot still exceeded that from the control plot by 27 per cent.

Moreover, quality favored the asphalt barrier. Barrier cucumbers were straight and smooth-skinned. Those from the control plot were pinched and knobby, showing the effect of earlier moisture shortage.

Late August observations on another test plot in Montcalm County showed barrier potatoes three times heavier and longer than control potatoes.

GENERAL SCIENCE

NSF Research Program For 1966-67 Announced

► **TWENTY SCIENTISTS** will study the geology and geophysics of the Marie Byrd Land coast, make magnetic measurements, and conduct botanical and topographic surveys during the 1966-67 U.S. Antarctic Research Program.

As a member of the party, Russian exchange scientist L. V. Klimov will study igneous rocks throughout the several mountain ranges encountered.

One of the most extensive Antarctic scientific surveys ever mounted by the National Science Foundation, the 1,500-mile air-supported traverse will begin Nov. 1, during the Antarctic summer, and end about mid-February.

Army and Navy aircraft will support the operation.

In another type of research project, University of Oklahoma scientists will study their colleagues who winter at the South Pole, to learn more about how man adapts to extreme environments.

The National Science Foundation funds and manages the U.S. scientific program in Antarctica.

PSYCHIATRY

Assassination Syndrome Fits Lee Oswald

► **FAILURE** in the military service, rage against women and suicidal desires make up what can now be called a presidential assassination syndrome, a Chicago psychiatrist said.

One of three psychiatric consultants to the Warren Commission, Dr. David A. Rothstein has found this syndrome in several of 40 men imprisoned for threatening the lives of Presidents. The syndrome is characteristic of the salient features of Lee Harvey Oswald's life, Dr. Rothstein, who is on the staff of Chicago's Michael Reese Hospital, said.

In analyzing testimony given to the Warren Commission by Oswald's family, Dr. Rothstein pointed out in the Archives of General Psychiatry, 15: 260, 1966, the similarities between Oswald and the men he studied at the Medical Center for Federal Prisoners in Springfield, Mo.

Characteristically, these men had their most intense relations with women, particularly the mother, Dr. Rothstein said.

Rejection by her and life-long emotional deprivation, however, promoted deep-seated anger and so, hoping to find a better "family," the men joined the military service.

But they failed there, too, or saw it as a failure, and the men turned their anger outward. In contrast, where there was an older brother, he was successful in the service, representing a kind of "favored son." Oswald's brother, Robert, is a good example of this, Dr. Rothstein noted.

By a strange alchemy, these Presidential threateners had been able to transmute anger at family and mother into anger at Government and President.

A letter threatening the President's life often followed closely upon some instance of rejection by a woman, which at that point, said the psychiatrist, might be a girl friend or wife.

One man, for instance was jilted by his girl friend. He then tried unsuccessfully to get into the service.

The letter he wrote to the President had the same quality as the letter he wrote to his girl, Dr. Rothstein told SCIENCE SERVICE.

Similarly, Oswald's wife, Marina, refused to come home to him just before he allegedly shot President John F. Kennedy.

"I can't say that caused the assassination," Dr. Rothstein cautioned, but he said it probably made an important contribution.

The psychiatrist is currently studying material on other assassinations, but does not know yet whether the syndrome will hold true for past assassins.

He plans a book on the subject to be published in 1967.