



noaa week

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NOAA Probing Stratosphere From Antarctica

Balloon-borne probes designed to sample fluorocarbons and nitrogen oxides in the stratosphere are being launched from Antarctica for NOAA this month.

The two probes are continuing NOAA's efforts to assess the danger to stratospheric ozone posed by fluorocarbons -11 and -12 (used mainly as refrigerants and propellants in aerosol spray cans) and nitrogen oxides, which have been identified as possible chemical destroyers of ozone.

An ozone layer in the stratosphere shields the planet's surface from biologically hazardous solar ultraviolet radiation. Some scientists fear that stratospheric ozone depletion could significantly increase the incidence of skin cancer and produce as-yet-undetermined changes in surface organisms.

The sampling packages, developed by Dr. Arthur L. Schmeltekopf and his colleagues at the

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Richardson Swearing-in Scheduled

"Heimlich Maneuver" Dislodges Lemon Drop

Safety Training Film Helps NOS Employee Save Son's Life

Six-year-old Douglas Batten is alive and well today because co-workers of his father, NOAA Computer Specialist Don Batten, attended a film shown by the NOAA Safety Engineering Staff,

Wind May Affect Later Fish Catch

Wind-driven ocean currents may affect the survival rate of ocean fish larvae, and thus determine the numbers of adult fish in later years, according to National Marine Fisheries Service scientists.

If the scientists can measure these survival rates under differing ocean conditions, they believe that they can make more

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and on their return to the office discussed and demonstrated what they had seen.

According to Sydney Smith, NOAA Safety Specialist, almost 1,200 NOAA employees viewed the film, "How To Save A Choking Victim," during the week he and Administrative Technician Fletcher Eckard, who is assigned to the Safety Engineering Staff, showed it in the various NOAA Washington, D.C., area locations.

Among them were Mr. Batten's co-workers in the National Ocean Survey's Aeronautical Chart Automation Project Office, who later discussed the "Heimlich Maneuver" in their office.

The following night, after work hours, Mr. Batten, who is handicapped, returned to his office, accompanied by his son, to pick up some work materials he planned to use on the weekend. As was customary on such trips, he allowed Douglas to help himself to the hard candies in his desk drawer while he assembled the materials.

Moments later, Douglas stopped in the middle of a sentence, his hand went to his throat, he apparently stopped breathing, and there was a look of bewilderment frozen on his face.

Mr. Batten immediately went behind his son and exerted pressure several times around the

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Secretary Richardson

Elliot L. Richardson, who has served as United States Ambassador to the United Kingdom since last February, will be sworn in as Secretary of Commerce on February 2. President Ford nominated him for the position on November 3, 1975, and he was confirmed by the Senate on December 11.

Mr. Richardson was appointed Under Secretary of State in 1969, and Secretary of Health, Education and Welfare in 1970. In 1973 he was Secretary of Defense and then U.S. Attorney General. He returned to private life in November 1973 and served as a distinguished scholar at the Woodrow Wilson Center for Scholars until his appointment as Ambassador to the United Kingdom.

In 1953 Mr. Richardson left private legal practice to serve for two years as Legislative Assistant to Senator Leverett Saltonstall of

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SENATOR ERNEST F. HOLLINGS of South Carolina and Howard W. Pollock, Deputy Administrator of NOAA, participated in the dedication this week of the new Local Storm-Warning Weather Radar at the Columbia, S.C., National Weather Service Forecast Office. Mayor John Campbell of Columbia was a speaker, and John C. Purvis, Meteorologist in Charge at the WSFO, was master of ceremonies.

A Commerce Bronze Medal was presented to Principal Assistant William G. Kerchusky "for development of effective severe weather preparedness procedures and outstanding leadership" at the WSFO.

In recognition of the importance of the new radar to the State, Governor James B. Edwards proclaimed the day, January 26, "Storm-Warning Radar Day" in South Carolina.

More than 200 persons attended. (From left) Mr. Purvis, Mayor Campbell, Mr. Kerchusky, Sen. Hollings, and Mr. Pollock.

North Carolina Receives CZM Grant

Coastal zone management planners in the State of North Carolina have received a supplemental grant of \$124,544 from the Office of Coastal Zone Management to continue developing a coastal protection program. The grant was requested as a result of an amendment by the 1975 State Legislature which allows local governments more time to complete their planning work.

Under the amendment, local

officials in North Carolina have until May 21, 1976, to submit local land use plans to the State Coastal Resources Commission for approval. Originally, the plans were to be submitted by November 23, 1975. With the supplemental grant, local officials now have the funds to carry out the extended work program.

Once adopted, the local plans will be incorporated into the statewide coastal zone management

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PARTICIPANTS IN THE SECOND AIR POLLUTION METEOROLOGY COURSE held recently at the National Weather Service Technical Training Center in Kansas City, Mo., were (front row, from left) James A. Harman, Fort Worth, Tex.; Barry B. Aronovitch, Olympia, Wash.; Joe Audsley, Instructor; Gary C. Franson, Fresno, Calif.; Myron H. Henriksen, Salem, Oreg.; George B. Smith, Jackson, Miss.; Stephen W. Harned, Silver Spring, Md.; Frank L. Sewall, Little Rock, Ark.; (back row, from left) Ronald P. Hunt, Louisville, Ky.; Shirley J. Matejka, St. Louis, Mo.; Donald W. Mankin, Atlanta, Ga.; Donald E. Risher, Charleston, W. Va.; Thomas Laufer, Camp Springs, Md.; Joseph A. Ronco, Jr., Portland, Maine; John T. Kuhn, Garden City, N.Y.; Edward D. Diemer, Anchorage, Alaska; and Richard F. Myers, Instructor.

Operationally oriented, the course illustrated how an individual station's air pollution program could be structured using broad national guidelines, and included lectures on legal aspects of air pollution control, industrial air pollution control methods and the biological effects of air pollution.

Climatological Data Summaries Published

The Environmental Data Service National Climatic Center has completed printing climatological data summaries for 143 National Weather Service cooperative climatological observing stations in the states of Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, South Carolina, Tennessee, Vermont, and West Virginia. The first group of summaries for 194 stations in the states of Alabama, Arizona, Arkansas, Connecticut, Colorado, Illinois, Iowa, Kansas, Louisiana and Mississippi was printed in July 1975.

Stations included in this special summary program are drawn from the group for which 1941 to 1970 normal values were calculated. The summaries are based upon digitized data available beginning in 1951 and include: a table of monthly and annual means and extremes of temperature and precipitation; sequential tables of monthly average maximum, average minimum, and average temperatures;

sequential tables of monthly total precipitation and snowfall; probability statistics for spring and fall freezes and length of growing season for five temperature thresholds; probability statistics for monthly total precipitation; and monthly and annual normals for mean temperature, total precipitation, total heating degree days, and total cooling degree days.

Summaries for the 337 stations in these 20 states are available from the National Climatic Center, Federal Building, Asheville, N.C., 28801 at \$0.15 per station copy.

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Probes of Stratosphere From Antarctica *(Continued from page 1)*

Environmental Research Laboratories' Aeronomy Laboratory, are being launched with NOAA support by a two-man team from the University of Wyoming's Department of Physics and Astronomy in Laramie, which is conducting research in Antarctica supported by the National Science Foundation.

The package consists of six stainless steel spherical flasks, each equipped with a minicomputer-controlled valve. The flasks are evacuated and immaculately cleaned so that the small concentrations being measured—typically a few parts per ten billion—are not contaminated by other materials.

As the probe rises through the stratosphere, the minicomputer directs different valves to open at different altitudes, so that a vertical profile of stratospheric fluorocarbons and nitrogen oxides can be calculated in the sub-

N.C. CZM Grant

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ment program North Carolina is developing. The State is in its second year of designing a CZM program aimed at achieving the wisest and widest possible use of coastal land and water resources for such diverse uses as recreation, development, housing, highways, harbors, agriculture, conservation, mineral mining, energy production, and other activities.

To help North Carolina develop its program, the Office of Coastal Zone Management has awarded it nearly \$1 million in grants, to which the State has added more than \$500,000 of its own funds. North Carolina is also eligible for a third-year planning grant under terms of the Coastal Zone Management Act of 1972.

sequent laboratory analysis.

Two 30-foot diameter balloons (about 10 meters) carry the 35-pound (16-kilogram) package to a maximum altitude of 90,000 feet (27 kilometers). When one balloon bursts, sensors destroy the other balloon automatically, and the package drops back to earth with a parachute. Aircraft track a radio beacon signal from the instrument to the spot where the device has come down.

The Antarctica launches are being made in conjunction with the University of Wyoming's program to measure aerosols (tiny particles) in the stratosphere, which will involve separate balloon missions. Antarctic operations are being run from the U.S. Navy weather balloon facility at McMurdo Sound. The probes will be pursued and tracked by Navy helicopters, which can land to recover the scientific payload after each mission.

Hurricane Edith Data Available

In May 1975, the Environmental Data Service reported the availability of storm and hurricane data reports donated to the EDS National Oceanographic Data Center by the Shell Oil Company. One report, relating to Hurricane Edith on September 16, 1971, was not made available at that time.

A limited number of copies of this report are now available for free distribution on a first-come, first-served basis. When these are gone, microfilm copies will be available at cost. The microfilm copies also include the six earlier reports covering the winter storm of February 1969; Hurricane Camille, August 1969; Tropical Depression, September-October 1969; Hurricane Laurie, October 1969; Hurricane Celia, August 1970; and tropical storm Felice, September 1970.

For further information, write NOAA/EDA, National Oceanographic Data Center, Washington, D.C. 20235.

Safety Training Film

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middle of his waist, executing what he understood to be "Heimlich Maneuver" to from his co-workers' descriptions. After two such attempts the pit lemon drop was dislodged from the boy's throat, and he was again able to breathe and talk.

Mr. Batten and his family are very grateful for the NOAA Safety Program and the second-hand instruction he received from his co-workers, and urge that NOAA's Safety Program be more widely publicized.

Future NOAA probes later this year will include an Arctic launch and a monthly series to be launched from the Laramie facility.

best fish buys

According to the NMFS National Fishery Education Center in Chicago, the best fish buys for the next week or so are likely to be pollock fillets and whiting along the Northeast Seaboard; gray sea trout and croaker in the Middle Atlantic States, including the D.C. area; speckled trout and Spanish mackerel in the Southeast and along the Gulf Coast; whole buffalofish and fresh walleyed pike fillets in the Midwest; Dungeness crab and fresh salmon in the Northwest; and Dungeness crab and blackcod fillets in the Southwest.

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Catherine S. Cawley, Editor
Warren W. Buck, Jr., Art Director

Ohio State University Receives ERL Grant For Tornado Research

A \$20,000 grant for research on certain atmospheric conditions which may influence the structure and lifetime of tornadoes has been given to Ohio State University in Columbus by NOAA. The research was funded by the Environmental Research Laboratories' National Severe Storms Laboratory in Norman, Okla.

The grant recipients are Drs. O. R. Burggraf, Professor, and M. R. Foster, an Assistant Professor, in the Department of Aeronautical and Astronautical Engineering at the university.

At present, the conditions which cause tornadoes are not sufficiently well understood. The scientists will be investigating a mathematical model of a tornado-like whirlwind to determine why some tornadoes, initially characterized by smooth-flowing winds, evolve into turbulent, contorted rope-like funnels or break up into several turbulent tornadoes rotating about a common axis.

Results of their research may shed light on structural characteristics of tornadoes and their lifetimes.

Dr. Robert P. Davies-Jones, a Geophysicist and specialist in tornado dynamics at the NSSL, is monitoring the project.

Kansas Tax Changes

Employees who are subject to state tax withholdings for the State of Kansas may notice a minor change in their state tax for salary checks dated on or after February 11, 1976.



National Ocean Survey recently completed negotiations for the first renewal of agreement with National Alliance of Postal and Federal Employees, Local 209, covering all nonprofessional employees of the Aeronautical Chart Division.

Participants, shown during the signing were (seated) R. Adm. Allen L. Powell, Director, National Ocean Survey, and (from the left) Barbara Wise, Steward of Local 209, NAPFE; Walter Chappas, Technical Assistant, Aeronautical Charting and Cartography; Robert White, National President, NAPFE; Ralph C. Reeder, Chief, Personnel Division; Captain James P. Randall, Associate Director, Aeronautical Charting and Cartography; Tommie Wilson, President, Local 209, NAPFE; and Stephen Yachmetz, Chief, Aeronautical Chart Division, NOS.

Scientists Say Weak Ozone Shield, Solar Flares Possible Cause of Ancient Species' Extinction

The biological consequences of a weakened stratospheric ozone shield may be legible in the fossil records of events occurring hundreds of thousands of years ago, according to scientists with the Environmental Research Laboratories and the National Center for Atmospheric Research.

About 700,000 years ago the earth's magnetic field almost disappeared as it decayed toward a reversal of polarity, a phenomenon which appears to happen every few hundred-thousand years. A millenium or two later, the reversed magnetic field regained its normal strength.

But during this magnetic nap, some marine life forms seem to have disappeared.

ERL and NCAR scientists have now advanced a plausible mechanism for this puzzling "faunal extinction" during geomagnetic polarity reversals. It is a celestial triple play, in which the weak magnetic field, large solar flares, and chemical reactions in the high atmosphere combine to destroy the stratospheric ozone layer, admitting the sun's hard ultraviolet radiation into our garden of life.

"It appears," they report, "that current concern about possible anthropogenic destruction of stratospheric ozone may be well founded, since it is possible that major ozone depletions occurring in the distant past have had a profound effect on the development of life as we know it."

The researchers—Drs. George C. Reid and I.S.A. Isaksen of ERL's Aeronomy Laboratory; Paul J. Crutzen of the Aeronomy Laboratory and NCAR; and

Thomas E. Holzer of NCAR's High Altitude Observatory—published their proposal, "The Influence of Ancient Solar-Proton Events on the Evolution of Life," in the British scientific journal, *Nature*.

Timing of the last magnetic polarity reversal is based on ancient magnetic fields "frozen" in sedimentary deposits beneath the ocean floor, and recovered by scientific deep-drilling operations. But the same deep ocean cores which provide this record of ancient magnetism also offer evidence that some species of marine microorganisms disappeared during the magnetic reversal. And some scientists believe that evolutionary "quantum jumps" through mutation may also have accompanied past reversals of the geomagnetic field, when the disappearance of some species provided a biological vacuum which mutant species quickly filled.

The scenario proposed by the ERL and NCAR scientists begins with the earth's magnetic field declining toward its polarity reversal, when our geomagnetic guard is down.

Then a large solar flare—a flare comparable to that of August 1972 or larger—occurring during the thousand-year interval of the reversal would shower the earth with solar protons carrying energies ranging from 10,000 to a billion electron-volts. Without a strong magnetic field to deflect them poleward, the particles would bombard virtually the entire planet.

Still, the earth's second line of defense—the stratospheric layer of ozone that blocks the sun's biologically damaging ultraviolet radiation—would be intact.

But not for long, the Colorado researchers say.

Recent work by the NOAA scientists has demonstrated that

energetic solar particles and cosmic radiation (particles from outside our solar system) set off chemical reactions in the high stratosphere that produce large quantities of nitric oxide, a voracious chemical enemy of ozone.

Once nitric oxide is introduced into the stratosphere, it becomes part of an extremely efficient ozone-destroying cycle, in which virtually no nitric oxide is lost. Thus, in the unmixed, layered world of the stratosphere, the nitric oxide can remain for years, catalyzing the destruction of ozone and reforming until natural processes finally remove it in the form of rained-out nitric acid.

The scientists calculate that solar flares comparable to those of August 1972, occurring during geomagnetic reversal, would produce enough nitric oxide to reduce stratospheric ozone by nearly 10 percent, and that flares 100 times that large would cause an almost 50 percent reduction in the ozone layer.

Thus weakened, the ozone shield would admit the strong ultraviolet rays of the sun. Dr. Reid and his colleagues estimate that under such conditions, a proton event comparable to that of August 1972 would increase the effective ground-level ultraviolet dosage by 15 percent. Solar events ten times that intense would increase the dose by 55 percent. Flares 100 times as intense would increase the dosage by 160 percent.

"Biological species that had evolved over the preceding several million years of geomagnetic stability might be unable to survive the harsher ultraviolet environment," they write, "and would presumably be replaced by other species with more adaptability."

Richardson Swearing-in (Continued from page 1)

Massachusetts. After a renewed association with Ropes, Gray, Best, Coolidge and Rugg in 1955 and 1956, Mr. Richardson was appointed Assistant Secretary for Legislation of the Department of Health, Education and Welfare, and also served as Acting Secretary of HEW from 1957 to 1959. In 1959 he became United States Attorney for Massachusetts. In 1961 he served for two months as Special Assistant to the Attorney General of the United States, before becoming a partner in the law firm of Ropes and Gray of Boston. He was elected Lieutenant Governor of Massachusetts for the term 1965-1967. From 1967 until becoming Under Secretary of State, he held the office of Attorney General of Massachusetts.

Mr. Richardson was born in Boston on July 20, 1920. He was graduated from Harvard with

an A.B. (cum laude) in 1941 and received his LL.B. (cum laude) in 1947 from Harvard. While attending Harvard Law School he was President of the Law Review.

He served with the United States Army as a First Lieutenant from 1942 to 1945. He was awarded the Bronze Star Medal for Heroic Service and the Purple Heart with Oak Leaf Cluster after landing with the 4th Infantry Division on D-Day in Normandy.

From 1947 to 1949 he served as a law clerk for Judge Learned Hand and Supreme Court Justice Felix Frankfurter successively. In 1949 he was made an Associate to the law firm of Ropes, Gray, Best, Coolidge and Rugg of Boston.

He is married to the former Anne Francis Hazard and they have three children.

notes about people

SELECTED RECENTLY AS CANDIDATES FOR WOMAN OF THE YEAR, 1976, IN THE FIELDS OF SCIENCE AND RESEARCH by the Ladies' Home Journal were J. Virginia Lincoln, Chief of World Data Center "A" for Solar Terrestrial Physics, in the Environmental Data Service's National Geophysical and Solar-Terrestrial Data Center, in Boulder, Colo., and Dr. Joanne Simpson, former Director of the Environmental Research Laboratories' Experimental Meteorology Laboratory at Coral Gables, Fla.



Ms. Lincoln



Dr. Simpson

Ms. Lincoln, who also serves as Chief of NGSDC's Solar-Terrestrial Data Services Division, received a Commerce Gold Medal in 1973 for her role as a leader in the development of NOAA's scientific data management programs of major benefit to the Nation and to the international scientific community.

Dr. Simpson received a Commerce Gold Medal in 1972 for pioneering research in tropical weather modification, and a Silver Medal in 1967. Since July 1974 she has been a Professor of Meteorology in the Department of Environmental Science at the University of Virginia in Charlottesville.

David H. Rand, who has been serving as a program analyst with the National Marine Fisheries Service Office of Resource Research in Washington, D.C., has been selected as the Senior Financial Analyst in the NMFS Plans and Policy Development Staff.



Mr. Rand

He has been in the Fisheries Service since 1966, serving in varied administrative, financial and program analyst positions. He is a graduate of Western New England College, Springfield, Mass., and has done graduate

work at Bridgeport (Conn.) University.

Dr. Gaylord R. Miller, Director of the Joint Tsunami Research Effort at the Environmental Research Laboratories' Pacific Marine Environmental Laboratory in Honolulu, Hawaii, has been elected a Vice-Chairman of the Tsunami Committee, International Union of Geodesy and Geophysics. A specialist in ocean waves and deep ocean instrumentation, Dr. Miller joined the Commerce Department in 1964 after receiving M.S. and Ph.D. degrees in physical oceanography from Scripps Institution of Oceanography at the University of California in San Diego. He previously received a B.S. degree in mathematics from Pomona College in Claremont, Calif.



PARTICIPANTS IN THE GEODETIC SEMINAR AND SUPERVISORY TRAINING COURSE for National Geodetic Survey field personnel held recently in Richmond, Va., were (front row, from left) Billy Simms, Stephen Dillon, Vernon Hughes, (second row, from left) Frank Perryman, Klaus Drehmann, Wesley Odum, James Swinney, Richard Wright, Gregory Smith, (back row, from left) Jeffery Fredrick, David Bell, Raymond Millikan, Michael Fowler, and (not in photo) Charles Wright.

The objective of the Seminar was to provide cross training and a basic understanding of the science of geodesy so that the participants, who represented various facets of NGS field operations and were selected on the basis of their individual achievements, interest, and potential, will be able to relate better their activities with those of other elements within NGS.

SIGNALING THE END OF AN ERA AT THE NATIONAL OCEANOGRAPHIC SURVEY'S PACIFIC MARINE CENTER in Seattle, Wash., Cdr. Wayne L. Mobley removes the plotting head from "The Iron Ensign," a

digital flat-bed plotter which has now been replaced by a new, more efficient plotter. The "Iron Ensign" had been used to draft the finished hydrographic survey sheets and intermediate documents produced at PMC since 1964. It yielded tremendous savings in time. The five hours of plotter time needed for a typical sheet was one-tenth the time that would have been needed to plot the same material by hand. About 7,000 sheets of various types up to 42 by 60 inches in size have been constructed on the plotter. Each point on a sheet is plotted to an accuracy of five-thousandths of an inch.

Cdr. Mobley, Program Manager for Operational Techniques in the Engineering Development Laboratory of the NOS Office of Marine Technology in Rockville, Md., happened to be at PMC when the plotter was being removed. The original installation of the plotter, together with a computer and other supporting hardware had been his responsibility on one of his earlier assignments as a commissioned officer.



Wind May Affect Fish Catch *(Continued from page 1)*

accurate predictions of fish stock sizes as far as two to three years in advance. This in turn will enable commercial fishermen to better plan their operations.

Andrew Bakun, an Oceanographer with the NMFS Pacific Environmental Group in Monterey, Calif., has studied atmospheric data compiled monthly since 1946 for a number of locations off the east and west coasts of North America and the Gulf of Mexico. From his studies, he has determined the wind direction for periods of time when the fish larvae would be under the influence of currents driven by the wind.

Dr. Walter R. Nelson, who leads the MARMAP (Marine Resources Monitoring, Assessment, and Prediction) Task on Oceanic Distribution of Young Menhaden, and Dr. William E. Schaaf, Leader of the Biometrics and Automatic Data Processing Unit, at the Atlantic Estuarine Center in Beaufort, N.C., and Dr. Merton C. Ingham, Director of the Atlantic Environmental Group, at the Northeast Fisheries Center Facility in Narragansett, R.I., have correlated the number of menhaden caught along the North Carolina and Virginia coasts with data obtained by Mr. Bakun and have found there is a close tie between the wind and the number of fish for a later year. They found when there are unfavorable winds the larvae are blown away from the estuarine areas where they feed, and fewer fish survive. By the same token, when the winds are favorable

and the larvae can reach the estuarine areas, survival is high. Thus, two years later, when these larvae have grown and entered the fishery, more fish are available.

On the west coast of the United States another phenomenon influenced by wind has an effect on the populations of fish: "upwelling," which occurs when wind blows surface water away from the coast and it is replaced by water from deeper levels of the ocean. The deeper water brings with it nutrients which support plant growth and provide food for higher levels of fish.

Richard Parrish, Fishery Biologist in the Pacific Environmental Group, has correlated upwelling and other indices of environmental change with the number of Pacific mackerel along the California coast in a given year. He found that the upwelling indices correlated well with the number of mackerel in a given year, and that sea level data from Scripps pier in La Jolla, Calif., also correlated well with the numbers of fish.

Both sea level and the upwelling indices are indicators of fluctuations of coastal circulation and thus would be related to drift of fish eggs and larvae. The fishery for Pacific mackerel has declined in past years and commercial catches are no longer made. Study of the data may shed light on the cause of the decline.



National Oceanic and Atmospheric Administration

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