

was a white light solar flare, one containing all the colors of the visible spectrum.

Outpourings of protons, electrons and other forms of radiation accompanying the flare were picked up by earth-orbiting satellites such as the Navy's SolRad series, while scientists watching the moon feared—unnecessarily, as it turned out—that the film in Lunar Orbiter 4, which was taking pictures at the time, might become fogged.

Nor was the solar spectacular over. Two days later, the unusual flare was followed by the most intense magnetic storm in more than a decade, which lasted for more than 24 hours.

The flare itself was the real rarity, however. Although it was second in a succession of three close-together flares, the others showed no traces of the white light phenomenon.

A white light flare is actually part of a larger flare, and exists only at the bigger one's peak size, and at the point where it is hottest. The eruption encompassing the May 23 white light flare was rated at "Importance 3," almost the maximum size and duration in a scale that only extends up to 3+. Scientists at the center believe the flare may have produced synchrotron radiation—streams of electrons accelerated to prodigious energies by passing through an intense magnetic field—which is the same kind of radiation produced in the Crab Nebula, a major celestial source of radiation. If this is



Mt. Wilson and Palomar Observatories

The Crab Nebula—like a rare flare.

true, McIntosh says, it is probably safe to conclude that all such white light flares produce this kind of emission. It is also likely that the presence of synchrotron radiation would be closely connected with strong magnetic disturbances.

Unfortunately, it may be difficult to

find out if such radiation did indeed come from the recent flare. The usual method would be to measure the polarization of the flare's light as it was in progress, but since the white light was unexpected, no such measurements were set up beforehand. Fortunately, however, there may be other techniques available, since the flare was photographed; it is believed to be the first of its kind ever captured on film. The U.S. Air Force's Sacramento Peak Observatory, located in Sunspot, N. Mex., has its own White Light Patrol, which automatically photographs the solar disk every 30 seconds. Scientists there are attempting to analyze the flare's radiation through the use of photometry.

Astronomy itself is almost as old as the human neck-joint, but flare-watching, says McIntosh, dates only from early September of 1859. The English astronomer Richard Carrington, who was sufficiently accomplished to have had his own observatory for six years previously, was trying to measure the sun's rotation by studying sunspots as they moved across its face. On September 1 or 2, while looking at the dark sunspots, he suddenly came upon a blazing patch of light that was brighter even than the rest of the sun's surface. His curiosity was aroused and a science was born.

RADIO ASTRONOMY

Carbon Broadcasts

Space is occupied by atoms of many elements—from hydrogen on up to the heavier elements. To radio astronomers, however, only the few—helium and hydrogen up to now—which emit energy in the radio frequency range—are of any value. Now there may be a third.

The newly-discovered radiation probably comes from carbon, according to studies by six Harvard College Observatory astronomers and one from the National Radio Astronomy Observatory in Green Bank, W. Va. They reported to last week's American Astronomical Society's sessions in Williams Bay, Wis.

Radio waves from hydrogen sources in the sky have already enabled maps to be made of the Milky Way's spiral structure in greater detail than was possible optically.

The hydroxyl ion, a charged combination of the elements of hydrogen and oxygen, has also been found to emit microwave radiation.

Deuterium, a heavy form of hydrogen, has been sought and reportedly detected by the Russians, but this has not been confirmed.

The emission from carbon was discovered when the astronomers were looking for radio emission at a frequency (5009 megacycles) where they expected to find further evidence of helium, or possibly of hydrogen.

They found five helium sources, but they also detected two other objects sending out radio waves believed unlikely to be from either helium or hydrogen. These objects broadcast at a slightly different frequency (5011.33 megacycles), which was far enough from the expected frequency so that the scientists are fairly sure it was not simply an error in observing helium or hydrogen.

The radio wave observations were made using the National Radio Astronomy Observatory's 140-foot antenna, equipped with a 21-channel spectral-line radiometer which broke the incoming signals down into their different frequencies.

Drs. Patrick Palmer, Benjamin Zuckerman, Hays Penfield and A. Edward Lilley of Harvard, with Dr. Peter G. Mezger of the NRAO, made the observations, reported to the meeting by Dr. Palmer. The theoretical basis for assigning the measured radio wave line to carbon was worked out by Dr. Leo Goldberg, director of Harvard College Observatory, and graduate student Andrea K. Dupree.

AIR POLLUTION

Apathy Clouds the Air

Air pollution has been a fact of life ever since man learned not to sit downwind from a campfire.

It has been a national political issue in the United States, however, only in the last few years, when conservationists and clean-air-minded Senators decided it was time industrial and urban polluters were called to heel.

Momentum began to build in December, when President Johnson called a national clean air conference in Washington, to launch his own clean air package of proposals, and take the play away from the Congress.

Since then, the Senate Public Works Committee has been holding hearings and drafting legislation which, when it is unveiled next month, should incorporate both Presidential and Congressional views and raise the key question sharply: how much power should the Federal Government have to force urban and industrial polluters to spend their share of the estimated \$3 billion a year it will cost to clean the air?

The contest may have to be fought, however, in the shadow of less public concern than either the conservationist proponents of legislation or their cost-conscious opponents may realize.

**"They laughed
when I wound up
my shaver..."**



That's liable to happen to you when you first use the RIVIERA in front of anyone. A wind-up shaver may seem a plaything. Or at best an emergency type of shaver (because it needs no cords or batteries). After all, how can a hand-cranked shaver rotate fast enough to do a clean and close job? And how many times do you have to wind the darn thing to finish one shave?

One answer at a time: The three-blade shaving head revolves at such a fast clip that it actually gives you **seventy-two thousand cutting strokes a minute!** Compare that to your \$30 TurboDeluxe. Now, about the winding. The palm-shaped body of the RIVIERA (named for its birthplace, Monte Carlo) is filled with a huge mainspring made of the same Swedish super steel used in the most expensive watch movements. You crank the key just like a movie camera (about six turns) and the RIVIERA shaves and shaves and shaves. From ear to ear; from nose to neck, without slowing down. Maintains its full shaving speed right to the end—and long enough to do the complete job. Hard to believe, but really true.

A few more details: The surgical steel blades are so designed that they are continuously self-sharpening. You will find that the more you use the RIVIERA the sharper and the better it gets. The guard is so unbelievably thin (5/100 of a millimeter) that pressure is unnecessary. You just touch the shaver on your face and gently guide it in circular motions.

We could go on. But we don't expect to sell you with words. We just want to get you open-minded enough to tie up \$17 for two weeks. We'll give you that long to put the RIVIERA to the test. If it disappoints you (if you want to return it for any reason), send it back. Your money will be in the return mail. Obviously, we have reason to believe that this won't happen and that you will want to keep your RIVIERA for the office, club, cabin or in a permanent place in your bathroom cabinet. It's that kind of a thing. Once you've tried it you won't let it go.

P.S. You not only save the cost of an electric motor, but you save the cost of repairing it. The money that it leaves in your pocket; the dependability; the good, fast, clean shaves that you'll get—they'll give you the last laugh.

PLACE YOUR ORDER HERE

Mail to: **Haverhill's** SN-0624
526 Washington St., San Francisco, Calif. 94111

Please send me the RIVIERA Shaver. I must be amazed and delighted or I may return it within two weeks after receipt for immediate refund. I understand that there is a one year's unconditional guarantee on parts and workmanship.

- I enclose \$16.95 plus \$1.00 for postage and insurance. (Calif. residents add 4% sales tax.)
- Bill Amer. Express Acct. # _____

Name _____
Address _____
Zip _____

© 1966

Haverhill's

Searching the World to bring you the Finest

Even today, according to a study conducted for the U.S. Public Health Service, 37 percent of central city dwellers, 40 percent of suburbanites and 72 percent of their country cousins refuse to acknowledge that air pollution is a problem with which they have to be concerned.

The reason is lost in the mists of human motivation, but, according to Prof. Ido DeGroot of the University of Cincinnati, a specialist in community planning, "it is entirely possible that roughly 35 percent of the population exposed to high levels of air pollution must deny its existence for psychological reasons."

Dr. DeGroot and other social scientists exchanged views during the 60th annual meeting of the Air Pollution Control Association last week in Cleveland, where the survey was reported. And they seemed to conclude that air pollution control is more a political than a technological question, and the public must become more concerned before pressure appropriate to the task can be brought to bear.

Technical studies, cost-effectiveness proposals, concern for local rather than Federal control of local problems and the complaint that controls instituted against a given industry will upset its competitive position, however, remain the refuge of opponents of strong Federal action.

But these opponents of Federal legislation "ought to put forth counter-proposals," rather than "repeat the same cliches, the same tired slogans which have been used for at least 60 years," says Dr. John T. Middleton, director of the National Center for Air Pollution Control.

Dr. Middleton, who delivered the keynote address, spent much of his time making it clear to the delegates that without passage of an Air Quality Act of 1967, they would see little further action in air pollution control.

Among other things, the Act would authorize the Federal Government to set emission standards for industry and would establish air quality commissions where interstate pollution was not adequately controlled by local or state authorities.

According to Prof. DeGroot, one reason for the long public apathy toward air pollution may be feelings of social impotence by individual citizens. "Public education . . . appears to have little effect other than in probably raising the already considerable level of anxiety about this environmental hazard, from which escape is impossible. This feeling of social impotence was clear in all studies, especially when questions were posed about complaints made about air pollution.

"People simply did not complain,

because there was little they saw that could be done.

"People seem to assume that government on all levels has enough powers to cope with the problem," according to Prof. DeGroot. Citizens have been relatively inactive because most of them have not realized that the technology is available and the problem is in the political arena where they can have influence.

TOXOPLASMOSIS

Parasites Tagged

Five thousand newborn babies in the San Francisco area are being tested to find how widespread the congenital form of a parasitic disease called toxoplasmosis may be.

Estimates have been one in 1,000 to 2,000 babies, although one large survey showed the disease to occur at a rate of 0.7 cases per 1,000.

The ailment also occurs in adults, but less seriously. With babies, damage can be done before symptoms appear.

Untreated, unrecognized toxoplasmosis can cause tissue destruction, with mental retardation and blindness often resulting.

How the infection is acquired originally is not known, but certain animals such as dogs, rats and hogs are the apparent source of the parasite *Toxoplasma gondii*.

Up to now the most important diagnostic procedure for toxoplasmosis has been the Sabin-Feldman dye test for toxoplasma antibody. This test usually becomes positive in a week or so after infection, but response is sometimes delayed as long as one month.

In Washington, D.C., last week, Dr. Jack S. Remington of the Palo Alto Medical Research Foundation, Palo Alto, Calif., reported a simple technique requiring only two hours. Details of the method will soon be published in a medical journal, and it is hoped that other studies of the newborn will soon be under way.

This is the way it works:

Dry toxoplasma is placed on a slide and a small sample of the baby's blood serum is placed on it, sticking to it. The slide is then washed off and fluorescent-tagged antiserum from a goat that has the disease is placed on the slide. If the baby has been infected the material fluoresces.

Dr. Remington made his report to the advisory committee on medical research of the Pan American Health Organization, made up of 30 scientists from 12 countries. Represented were Argentina, Brazil, Chile, France, Jamaica, Mexico, Peru, Switzerland, Uruguay, the United Kingdom, the United States and Venezuela.