

investigator catches some guy masturbating at a fire.") Far more incendiary fires, the committee agrees, are set by businessmen who want to collect insurance on their businesses, or who hire professional arsonists to do it for them. About 40 percent of all incendiary fires are set to collect insurance on faltering businesses, according to committee member Robert E. May, vice president of the International Association of Arson Investigators. Still other incendiary fires, the committee reports, are set by thrill seekers or by persons out for revenge.

Another surprising aspect of the arson problem, Moretz points out, is how little is known about what makes arsonists tick. The several studies that have been done on the personalities and behavior of arsonists, he says, suggest that arsonists come from disrupted homes and have already committed other types of property crimes. But the studies failed to break the arsonists down according to motive.

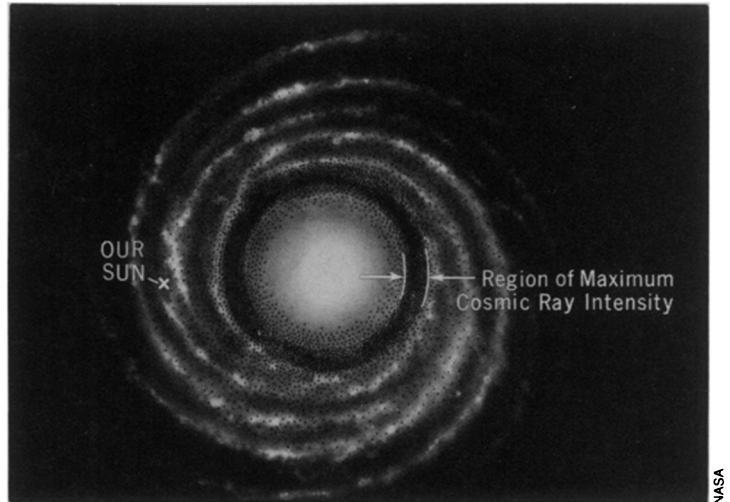
It is possible, of course, that all kinds of arsonists share certain personality and behavioral problems. This is the impression Moretz has received in dealing with juveniles who set fires as a means of rebelling, to get money for dope, to cover a burglary and for other reasons. These arsonists, he says, invariably come from a disrupted family, have trouble forming relationships with people and "are the kind of persons who tend to leap before they look." Although most of the arsonists Moretz has dealt with are male, he says that more women are becoming arsonists. This trend would be in keeping with an upsurge of crime among women in general (SN: 6/14/75, p. 384).

The kind of arsonist who has eluded psychological analysis the most is probably the professional, the committee members report. Fires-for-hire types are generally strangers in the areas where they set fires, the evidence from their acts is usually consumed in flames, and unlike pleasure-seeking arsonists, they don't hang around to get kicks or to admire their handiwork. In short, professional arsonists are too infrequently apprehended, and, in turn, psychologists and psychiatrists do not have many case histories to study.

Why have incendiary fires increased during the past 20 years and especially during the past few? Committee members aren't sure, but they have some ideas. Property crimes in general have been increasing, along with other kinds of crime. The economic recession of the past couple years has fueled fraud fires. The public has come to tolerate aberrant behavior that it wouldn't have put up with a few years ago. And it has also allowed itself to be influenced by fire-oriented movies such as "The Towering Inferno" and "Save the Tiger," where Jack Lemmon pays a professional arsonist to set fire to his economically troubled clothing manufacture business. □

Origin of cosmic rays: Supernovas

New findings show that cosmic rays apparently emanate from regions toward center of galaxy noted for large numbers of supernova remnants.



The question of the origin of cosmic rays has been the central problem of high-energy astrophysics for over a generation. These highly energetic particles, mostly protons and alpha particles, bombard the earth uniformly in all directions from space. Determining where they come from has been frustratingly difficult. Being charged particles, they could never be traced backward because magnetic fields bounced them all around.

Now, at last, the question may be solved. With the use of recent satellite observations of the distribution of gamma rays and galactic gas, the galactic cosmic-ray distribution has been deduced. This distribution is identical to that of supernova remnants. The finding strongly supports the hypothesis that most observed cosmic rays are produced by supernovas in our own galaxy.

Floyd W. Stecker of the theoretical studies group at NASA's Goddard Space Flight Center reports the evidence in the July 21 *PHYSICAL REVIEW LETTERS*.

The idea that supernova explosions could provide the energy for accelerating cosmic rays is not new. Walter Baade and Fritz Zwicky first proposed such an origin in 1934. In the early 1950's the supernova-origin hypothesis gained support when the Russian astrophysicist I.S. Shklovskii theoretically linked cosmic-ray electrons to the Crab Nebula, a supernova remnant. In the last two years evidence has accumulated that the Crab Nebula and the Vela supernova remnant produce cosmic rays. But there were questions of how typical these two young, nearby supernova remnants are and whether it was valid to extrapolate to the conclusion that galactic supernova are the source of cosmic rays. The debate over whether the cosmic rays emanate from within our galaxy or from outside the galaxy has continued to the present.

The observations by the gamma ray telescope on the SAS-2 astronomy satellite may now have settled the matter. □

Galactic gamma rays result primarily from the decay of pi mesons produced when cosmic rays interact with interstellar gas. Gamma rays are thus a tracer for cosmic rays; they travel in straight lines undeterred by magnetic fields.

The new observations allow Stecker to determine that the cosmic-ray distribution of the galaxy is not uniform (as would be indicated by the extragalactic-origin hypothesis) and to see "a striking similarity" between the cosmic-ray distribution and the supernova distribution in the galaxy. It is a "remarkable agreement," he says, and it constitutes "very strong, almost conclusive, evidence that cosmic rays are produced in the same regions as supernovas, which are the only logical galactic events able to produce particles of such energy." □

Fetal research: Underway again

After a two-year hiatus, research on human fetuses can begin again. The research came to a halt when Congress, with the backing of antiabortion groups, imposed a moratorium on fetal research. Last week, the moratorium was lifted by Department of Health, Education and Welfare Secretary Caspar W. Weinberger when he signed new Federal rules that let fetal research pick up where it left off. (The signing was one of Weinberger's last official acts as HEW Secretary. He has resigned and will be replaced next week by David Mathews, president of the University of Alabama.)

The moratorium was lifted on the recommendation of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The commission suggested (SN: 5/3/75, p. 285) allowing almost all research except that which would threaten or end the life of an aborted fetus. □