

Three recall tests were administered immediately after each member of one group smoked a filter cigarette with 1.5 milligrams of nicotine and those in the other group smoked a nicotine-free cigarette (subjects were not told which type they were smoking). Two days later, 16 of the subjects returned (eight from each group). All were then asked to recall as many words as they could from the tests two days before.

The researchers found in the first experiment that those in the non-nicotine group, on the average, recalled substantially more words than did those in the other group. "Short-term memory for verbal materials was significantly hindered

by the smoking of cigarettes containing nicotine," report psychologist John P. Houston, psychiatrist Murray E. Jarvik and graduate student Nina G. Schneider. The findings corroborate some results of research reported in 1975, according to the UCLA group.

However, in contrast to previous findings, Houston and his colleagues found that after two days, "smoking cigarettes containing nicotine was associated with significantly poorer, rather than better, delayed recall. ... There does not appear to have been much change in the relative performance levels of the nicotine and non-nicotine groups across the two-day retention interval." □

Rockfest 9: A bigger name, a bigger game

This was the year they made it official: The ninth in the series of annual Lunar Science Conferences, or "rockfests," which began shortly after the Apollo 11 astronauts returned their precious samples of the moon to earth, was expanded into the Lunar and Planetary Science Conference. More than a mere blue-pencil exercise, the change betokened the far bigger game that the nearly 700 participants have been playing in recent years. Not just "where-did-the-moon-come-from" (a question yet to be resolved), but "what's-the-whole-story?"

Oh there were still some of the rock-by-rock autopsies that characterized the early gatherings ("Petrology of Apollo 12 Olivine-Pigeonite Mare Basalts 12007, 12015, 12043 and 12072"). But this year, the scientists assembled at the NASA Johnson Space Center in Houston seemed to be pushing the moonrocks — and other finds — toward their real potential in both space and time, relevant from the sun to the outer planets and from future mission plans back to hundreds of millions of years before the solar system was born.

The origins and pre-origins of the solar system, in fact, were a key topic, even though much of the most exciting work is still in its infancy, often depending on a relative handful of researchers probing tiny fragments of fragments from such objects as the Allende meteorite (which ironically reached the earth in the same year as the first Apollo moonrocks).

The key is certain isotopes, found in such meteorites in minuscule quantities, for which it is possible by painstaking analysis to calculate the amounts of other isotopes from which they presumably decayed. In recent years, researchers such as Robert Clayton of the University of Chicago and Gerald Wasserburg of California Institute of Technology have found that some samples contain more of the decay products than can be explained by the amount of the "parent" isotopes believed to have existed in the nebula from which the solar system condensed. One startling

conclusion has been that earthlings may be looking at material which "set" before that condensation. In other words, pre-solar grains.

Since that realization, a few scientists have embarked on the difficult next step of figuring out how such anomalies might have formed. It is a complex task — working backward step by step through various known (and unknown) nucleosynthetic processes in an attempt to figure out a scenario that could have produced the growing list of anomalies now in evidence.

A concept that has attracted a number of proponents, including the University of Chicago's David Schramm, is cataclysmic indeed: The solar system, Schramm and others argue, may have formed as the result of the passing shockwave of a nearby supernova. This relatively quick, high-temperature event could have accounted for some of the present anomalies (though some scientists maintain that other anomalies imply parent isotopes born in slower types of processes).

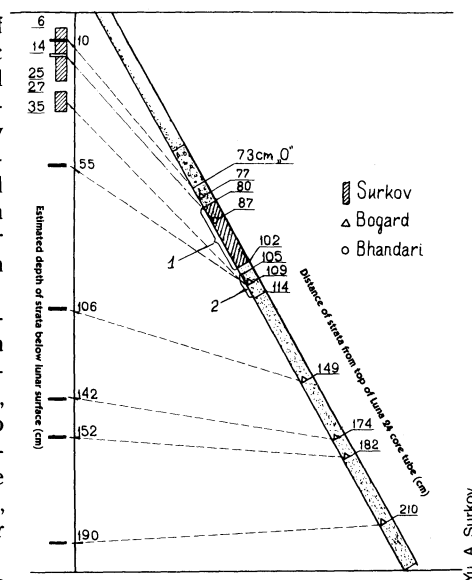
But the path to the truth is more tortuous still. ("It'll probably drive us crazy in the next few years," says one of the seekers.) One of the most cited anomalies, aluminum 26, suggests an origin about two million years before the solar system condensed. Others, however, such as iodine 129, point back 100 million years or more, suggesting that more than one pre-solar event may be leaving its traces around.

It may also be that not all such events played a direct part in making the solar system happen. Edward Anders, also of Chicago, reported xenon anomalies in samples of the 1969 Murchison meteorite that, he says, almost certainly indicate the presence of a red giant star of unusually low mass. Sidney Niemeyer of the University of California at Berkeley added to the pre-solar quest with the finding that iodine-xenon ages in certain meteorites (known as IAB) seem to correlate almost perfectly with the nickel content of the meteorites' metal phases. "This," he says, "is the first instance of a systematic rela-

tionship between any property of a meteorite class and the I-Xe ages."

Meanwhile, despite all the meteorites — and planets (see next week's SN) — the rockfest participants were far from forgetting earth's moon. Most of the Apollo moonrocks are still unopened, and the most recent arrival — the drill core from the Soviet Luna 24 robot — seems to unearth new surprises at every turn. One Soviet researcher announced that it had yielded the "first discovery" among lunar samples of titanium, silicon and aluminum in their reduced (metallic) forms.

U.S. researchers have raised the possibility that the Luna 24 core might also include, in its uppermost layer, material ejected from a crater on the moon's far side. No farside material exists in the Apollo samples, and scientists would love to get a look at some. Although it is possible that the farside crater's "ray" of ejected material may have missed the Luna 24 site, the chance of finding out now seems brighter with a Soviet rockfest report that the topmost material from the site still seems to be on top in the core sample, judging from its high gamma-radiation level. There have been worries in the United States that the core might have mixed up the original strata, but Yuri A. Surkov, head of the Planetary Study Laboratory at Moscow's Vernadsky Institute of Geophysics, says that the strata, while compressed, apparently are still in order.



Luna 24 core: Squeezed but still clear.

Looking to the future, many of the rockfesters were glum over NASA's dim view of the proposed Lunar Polar Orbiter, a geochemical mapping satellite intended to expand the narrow swaths of Apollo orbital data and the earth-based studies that are limited to the moon's near face. Thomas Young, NASA's director of lunar and planetary programs, says that the LPO is "not in the present strategy" and that the agency will probably not even seek initial funds to build it "for at least five years."

The satellite has been sought unsuccessfully in the last three NASA budget cycles, and the agency now ranks it behind such programs as the Venus Orbital Imaging Radar, a Saturn orbiter and double atmospheric probe, the beginnings of a late-1980s Mars mission and a comet program.

On the Soviet side, however, the picture looks different. Surkov told SCIENCE NEWS that a polar-orbiting lunar satellite *is* in the works, and that its mission is set to take place "within five years." □

Cosmonauts return, astronauts named

After a record-setting 96 days in orbit, Soviet cosmonauts Yuri Romanenko and Georgi Grechko left the Salyut 6 space station and returned to earth aboard the Soyuz 27 spacecraft on March 15. During the last week of their stay aloft, they followed an expanded exercise routine, intended to minimize the effects of the return to earth-normal gravity after the long period of weightlessness. Even so, back on the ground the cosmonauts found problems in otherwise easy tasks, such as turning a radio dial or lifting a cup of tea. Both crewmen have reportedly tried to "swim" out of bed in the morning, as was their custom in orbit. Soviet sources, however, have cited no serious readjustment problems.

The day after the Soviet spacemen landed, the U.S. space agency announced the selection of its first four two-man astronaut crews for the space shuttle, which is to begin orbital flights in spring of 1979. The first flight will be commanded by John W. Young, veteran of Gemini 3 and 10, Apollo 10 and the moon-landing Apollo 16. The pilot will be "rookie" Robert L. Crippen, who thus becomes the first of the astronauts who transferred over from the Air Force's canceled Manned Orbiting Laboratory program to get a prime-crew berth. The other selected crews have not been assigned specific shuttle flights, but one of them will fly the mission to raise the orbit of Skylab if it is decided to undertake the task. The crews are: Joe H. Engle and Richard H. Truly, who flew together in the shuttle's approach-and-landing tests; Fred W. Haise (lunar module pilot for Apollo 13) and Jack R. Lousma (pilot of the second Skylab crew); and Vance D. Brand (command module pilot for the Apollo-Soyuz mission) and Charles G. Fullerton (who flew shuttle tests with Haise).

The shuttle orbiter itself was transferred atop its 747 jet carrier last week from the West Coast to begin a series of tests at the NASA Marshall Space Flight Center in Alabama. Meanwhile, according to AVIATION WEEK, the Soviet Union is developing a reusable space shuttle of its own, a delta-shaped craft that has already been drop-tested from a Soviet Tupolev Tu-95 bomber. □

Strep vaccine for unborn children

A number of viruses and bacteria are known to threaten the health of the human fetus, either in the womb or as it makes its way through its mother's birth canal (SN: 4/12/75, p. 242). One of the villains is group B streptococcus. Although the danger of the bacterium to unborn children has been known for about 30 years, its prevalence and devastating effects have become more evident during the 1970s.

Group B strep appears to be transmitted to a woman's vagina during intercourse. She will experience no symptoms as a result of this infection. However, if the infection is present as a child passes through her vagina at birth, the child can also become infected. As a result of infection, the child may die shortly after birth or go on to develop blindness, deafness, spinal meningitis, mental retardation or epilepsy. Approximately 15,000 newborns in the United States suffer from group B strep infections each year.

It is now reported that a vaccine to protect unborn children against group B strep and its ravages is being developed by Carol Baker, assistant professor of pediatrics and microbiology at Baylor College of Medicine, Morven Edwards, a postgraduate fellow in pediatrics at Baylor, and Dennis Kasper of Harvard University. A report on their preliminary testing of the vaccine will appear in the April JOURNAL OF CLINICAL INVESTIGATION. □

Multiple sclerosis: A closer look

Multiple sclerosis (MS) is a slow, implacable killer. The central nervous system is only injured in patches as the disease sporadically destroys myelin, a fatty sheath insulating the nerve fibers. Scar tissue replaces the missing myelin and the flow of nerve impulses is interrupted or distorted. When this occurs, the resultant symptoms can include blindness, paralysis, numbness and loss of coordination.

MS seems an incredibly complicated disease, and scientists have yet to learn its cause, cure or treatment. Discoveries during the last few years suggest that MS results from a viral infection that precipitates an autoimmune disease in which the body's own immune defenses attack the myelin sheathing. But the disease is more complicated than that. Influences of genetics, environment and geography also figure into the risk formula.

A symposium at the recent meeting of the American Society for Neurochemistry focused on advances in the understanding of MS. Cedric S. Raine of the Albert Einstein College of Medicine in New York reported that the rare occurrence of a death from

acute multiple sclerosis has permitted a direct look at myelin destruction as it happens. In most cases death occurs only after a decade or so of the disease. The mechanisms that led to the cumulative damage of the tissue are usually no longer working.

Raine reported that the affected brain areas of a woman who died two weeks after the disease became apparent were inflamed. On the periphery of the lesions was evidence of attack of the myelin by antibodies and by the scavenger cells of the immune system, the macrophages. This finding supports the hypothesis that an autoimmune disease is a major component of MS. It also suggests that experimental allergic encephalitis (EAE) may be a good animal model of MS.

Studies on MS have been hindered by the lack of a suitable animal model that mimics the pathology of MS in humans. EAE is an autoimmune disease that quickly leads to death. It produces inflammation around blood vessels and much less destruction of myelin than seen in tissues from chronic MS patients. Raine's findings suggest that the early stages of MS may be like EAE.

Shirley E. Podulso of Johns Hopkins University School of Medicine in Baltimore has isolated the cells of the central nervous system that make myelin, the oligodendroglia. Both oligodendroglia and myelin disappear in MS lesions, and oligodendroglia are proposed to be the target cells in the disease. Podulso reported that the isolated cells from rats make whorls of myelin in culture, and may be capable of remyelination. She is now studying the largely unknown properties of these cells and trying to learn exactly how myelin is made.

Progress is rapidly being made in understanding the components of MS, and the hope is that a breakthrough in one of the smaller areas will provide ways to halt the spread of the disease and, perhaps, alleviate some of its symptoms. □

Drug effects: Longer lasting than thought

Compared with what is known about the immediate dangers of drug use and abuse, data on the possible long-term effects of substance use—even with narcotics such as heroin—are sorely lacking. There have been indications of permanent or slowly reversible neuropsychological impairment among polydrug (multiple) users: Researchers at the University of California at San Diego observed two years ago that a substantial number of multiple drug takers showed such deficits, including brain wave abnormalities, for as long as five months after beginning treatment. But few systematic studies have been able to document these preliminary findings.

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