

That feeling of déjà vu

The feeling of déjà vu surrounding last week's attempt on the life of Presidential candidate Gov. George C. Wallace (D-Ala.) has rekindled interest in the 1969 report of the National Commission on the Causes and Prevention of Violence. The accuracy of its predictions is striking.

The commission's report on Assassination and Political Violence said: "The best single predictor of whether a nation will experience assassination attempts is whether that nation experiences high levels of other forms of civil strife. Turmoil in general seems to be a factor which releases, creates or signals tendencies to assault the President with mentally unbalanced individuals in the population. Although there may be other factors, the key element in each Presidential assassination appears to be the state of mind of the potential assassin." The state of mind of past assassins has been diagnosed as "schizophrenia, in most instances a paranoid type."

The method of attack is predictable. Seven of nine attacks on Presidents or Presidential candidates were committed with hand guns, usually from point-blank range while the intended victim was in a public crowd. The attackers were usually ambivalent with respect to their victim, having had several opportunities to act. And, "in every instance the assassin felt no remorse."

"Although we cannot unravel the significance of the similarities between the assassins," the report continues, "we could make this statement: We could predict after President Kennedy's assassination that the next assassin would probably be short and slight of build, foreign born and from a broken family—most probably with the father



CBS News via ESS

Arthur H. Bremer: Accused of assassination attempt.

either absent or unresponsive to the child. He would be a loner, unmarried, with no steady female friends, and have a history of good work terminated from one to three years before the assassination attempt by a seeming listlessness and irascibility. He would identify with a political or religious movement, with the assassination triggered by a specific issue which relates to the principles of the cause of the movement. Although identifying with the cause, the assassin would not in fact be part of or able to contribute to the movement. Not every Presidential assassin has had every one of the foregoing traits, but some combination of the above has characterized them all."

Can matter meet antimatter peacefully?

Antimatter has a hard time existing on earth. The local abundance of ordinary matter (sometimes called koinomatter) guarantees that any antiparticle that appears will quickly meet its corresponding koinoparticle and be annihilated. Nevertheless accelerator experiments produce sizable numbers of antiparticles of various kinds, and experimenters have used antiprotons and antineutrons to build up antinuclei—as large as antihelium according to a Soviet report.

To make an antiatom, to fit out the antinucleus with the proper cloud of positrons that corresponds to the electron cloud of an ordinary atom, is a much more difficult step and has not yet been done in the laboratory. But antiatoms may exist somewhere in the universe. In fact the basic laws of physics imply that there should be antiatoms in numbers equal to koinoatoms, and some cosmologists believe in anti-stars and antigalaxies.

The chemistry of antimatter is thus of a certain interest, and two koino-physicists at the University of Pittsburgh, B. R. Junker and J. N. Bardsley, have calculated one important case of the chemistry of antimatter, the reaction of hydrogen and antihydrogen.

This is cosmologically the most interesting reaction because hydrogen is by far the most abundant element in the cosmos, and antihydrogen would be expected to be equally abundant. The intriguing question was whether the electromagnetic interaction between the positron of the antiatom and the electron of the koinoatom would provide a barrier that would retard or perhaps prevent the coming together and annihilation of nucleus and antinucleus. If it did, it would provide a mechanism whereby koinomatter and antimatter could coexist peacefully without eventually annihilating the universe and turning everything to gamma rays.

Although there has been much speculation about how such a reaction would go, "as far as we know," says Bardsley, "these calculations are unique." Unfortunately they don't give the universe any such out. The electron-positron interaction does provide a certain energy barrier but not enough to seriously retard annihilation in the hydrogen-antihydrogen case. Junker and Bardsley speculate, however, that for heavier antiatoms the barrier might be serious. This, they suggest, could support the contention that ball lightning is a lump of antimatter that has somehow invaded the earth's atmosphere and is being annihilated only slowly. □

Rapid changing Seyfert: Problems for theorists

In very-long-baseline interferometry, radio telescope signals taken simultaneously thousands of miles apart are combined. This provides information about the structure of radio sources that is impossible to determine with a single telescope. Application of the technique to two quasars (3C 273 and 3C 279) over the last year or so has shown changes in their appearance that caused something of a stir in astronomical circles because one possible explanation is that those quasars consist of two components flying apart at speeds greater than light (SN: 12/18/71, p. 405).

Since astronomers do not like to entertain such a gross violation of the basic laws of physics if they can help it, other explanations that fit the data have been forthcoming. The observation, might, for instance, be either a geometric or visual illusion.

But a similar change in radio appearance of a Seyfert galaxy, 3C 120, is now reported by D. B. Shaffer and M. H. Cohen of California Institute of Technology, D. L. Jauncey of the Cornell-Sydney University Astronomy Center and Kenneth I. Kellermann of the National Radio Astronomy Observatory. The observation was done with

what they call the Goldstack interferometer, a combination of telescopes in Goldstone, Calif., and Tyngsboro, Mass. The work is published in the May 1 *ASTROPHYSICAL JOURNAL LETTERS*.

This observation serves to make more general the occurrence of this phenomenon of rapid change, whatever it is. It underlines astrophysical and evolutionary relationships between quasars and Seyfert galaxies and increases the difficulties of explanation.

One of the ways by which the problem of superlight velocity in the quasars was avoided was to use the suggestion that quasars are not as far away as the redshifts in their light make them appear to be. (That is, something besides expansion of the universe is contributing to their redshifts.) If the quasars were closer than supposed, their components would not need to be separating as fast.

But 3C 120 is a galaxy with a better established redshift-distance relationship. One of the important effects of finding the same rapid-change effect in it, says Kellermann, is that it tends to undermine the argument that the quasars are nearer than they seem to be.

In 3C 120 the two-component argument can fit without a violation of physical law because the apparent separation velocity of the components is about twice the speed of light. This could be accomplished if each object had nearly the speed of light and they were moving apart along a line perpendicular to the line of sight. If that is so, something else follows from the observations: The two components are expanding more rapidly than they are separating. Eventually their edges should overlap, and something violent is likely to happen. The radioastronomers are watching for it. □

Viking payload cut; One experiment added

In 1976 two Viking spacecraft are scheduled to reach Mars, each carrying an orbiter and a lander. The craft will be the first U.S. attempt to soft land on a planet. Russia's Mars 2 landed in November.

It has not yet been announced, but, due to other budgetary priorities, NASA, as expected (SN: 2/26/72, p. 134), has now trimmed the Viking payload by simplifying most of the instruments, cutting one off completely, and (because of scientific pressure) adding one.

There were four biology experiments planned—each one a different test for changes in retrieved Martian soil due to the metabolism or growth of living organisms (SN: 7/24/71, p. 64). One of the four—a light-scattering experiment—has been deleted. Its purpose was to detect optical changes in a medium of distilled water due to growth of organisms. NASA contends the experiment wasn't really needed, since the other three biology tests will see similar characteristics (an excuse NASA often gives when cutting science).

Other instruments in both the orbiters and landers were trimmed. The orbital camera was simplified by taking off the equipment for image-motion compensation and image intensification. The resolution was reduced from the planned 25 meters to 100 meters (comparable to the high resolution camera on Mariner 9). "The system on the whole is better now," says one NASA official. "By simplifying it, we have increased its reliability."

Two other instruments felt the money crunch. A gas chromatograph that was to analyze eight soil samples now will analyze only three. The humidity detector was eliminated from the meteorology instruments. Said one scientist of the cuts: "We wonder what we have been doing for the last ten years. Back to Square One." The real fear of most of the scientists working with Viking, however, is that the payload cuts have only begun. The launch date is still three years off. "Who knows what else will be cut," said one.

The one addition to Viking was an X-ray fluorescence instrument to investigate the inorganic chemical properties of the soil. Two scientists vied to get their instruments on board—Anthony L. Turkevich of the University of Chicago and Benton C. Clark of Martin Marietta (the prime contractor for Viking). Turkevich's alpha particle scattering device that flew on Surveyor moon landers lost. A NASA official says the decision "was made on the basis of cost and weight differences, flexibility and science yield." Others disagree. □

NAE: Election of engineers curtailed

The National Academy of Engineering finally announced a foreshortened list of newly elected members last week, three weeks after its annual meeting. New members, elected by mail ballot, have in the past been announced some days prior to the annual meeting. The curious delay this year, and the small number elected (11), is related to a change in election procedures that was designed to give the members more of a say in who is chosen to join the NAE. That change in procedure, in turn, although no one is saying so officially, was intended at least in part to avert past criticisms that the NAE was more intent on electing highly placed corporate and government executives than engineers who had made noteworthy technological achievements.

The primary qualifications for election to the NAE are "important contributions to engineering theory and practice . . ." or "demonstration of unusual accomplishments in the pioneering of new and developing fields of technology." But a loophole states, "Effectiveness and efficiency in leadership of organizations that have conducted pioneering or complex programs . . . should be weighed as supplementing the primary qualifications."

In an acerbic article last spring, *NATURE* excoriated the NAE for apparently giving more weight to the prestige of a nominee's administrative position than to his engineering merit. To drive home its point, the article listed merely the titles of the 29 persons elected in 1971, saying their names were not important. "It is hard to understand," said that article, how the NAE "can exhibit so little imagination as to draw its new membership almost exclusively from the top brass of the Defense Department, Ford, General Motors, General Dynamics, Lockheed and so forth."

Whatever the connection between such criticisms and the revised election procedures, it is a fact that for this year's election a limit was placed on the number of "no" votes a nominee could receive without being eliminated. This resulted in the outcome announced last week: The 11 members chosen were the smallest number of new electees since the first election in 1965. The previous six elections had brought in 29, 51, 44, 50, 93 and 27. Last year 22 of the 29 new members held high positions in government and industry; this year 7 of the 11 are from universities.

The NAE understandably is sensitive about the whole issue. NAE President Clarence H. Linder acknowledged to *SCIENCE NEWS* that 11 is probably a smaller-than-desirable number of new members. But he pointed out that with the university people chosen this year, more than 30 percent of the organization's 363 members now come from the academic world, while only about 6 percent of the entire engineering community is in academia. He also observed that a not-always-understood factor in NAE elections is that an attempt is made to select persons who will participate in the activities of the organization when asked. How this affected this year's election was not clear.