

The auto in cities

"In all the world's cities, from Bogotá to Bangkok to Boston, the conflict between the city and the car is at the point of impending crisis," the Brookings Institution says in a new research report, "Making Cities Livable." The report was adapted from a book by Wilfred Owen, *The Accessible City*.

The report considers the automobile the prime cause of many urban problems in the United States. The car has made it possible, it says, for "people with enough money and the right color" to create a massive out-migration to the suburbs. "The negative effects of this trend are not being countered by community plans or by appropriate safeguards to prevent the pollution of the land or the decay of the cities left behind." This pattern has been copied all over the world, with particular detriment to less developed countries, it says.

Some of the ill effects everywhere include: The creation of unmanageable megalopolitan sprawl, congestion, inefficient street systems and the related problem of misuse of land, the absence of facilities for pedestrians in locations where walking would be the most efficient transport, and lack of easy accessibility between home and work for many residents. All this has the ultimate effect, suggests the report, of eliminating human communities and increasing alienation. A starting place for reform, it proposes, might be free mass transit.

Solar energy at sea

William J. D. Escher of Escher Technology Associates proposes in a paper given at the American Chemical Society annual meeting an ocean-based solar energy collection system that would produce pollution-free (although more expensive) fuel for mainland power plants. It would also produce usable by-products such as waste heat to warm up cold, nutrient-laden water from the sea's depths for aquaculture.

All of the basic elements of the system, says Escher, have been proven feasible or are regarded as feasible by outside experts.

A hypothetical location in the South Pacific near the Marquesas Islands would have floating solar energy "farms" (SN: 4/8/72, p. 237) in the form of a series of one-kilometer square nodules. The energy collected would then be used to convert water to oxygen and hydrogen. Those gases would be supercooled to liquids for transport via now-existing cryogenic tankers to mainland power plants. They would be recombined in the power plants to produce heat energy and water. The system would eliminate the pollution now produced by fossil-fueled plants.

Utilities lag in pollution control

The Council on Economic Priorities, a research group devoted to studies of corporate activity in social and environmental areas (SN: 11/27/71, p. 356), reports that 15 leading investor-owned electric utilities it studied lag badly in spending for pollution control and for new, nonpolluting generating techniques.

"These companies spent less than a fraction of one percent of their revenues on vital pollution control research in 1970 while spending six times as much (\$126.9 million) on advertising and sales promotion," says the report, "The Price of Power."

Gravitational synchrotron radiation

The gravitational radiation recorded by the detectors of Joseph Weber of the University of Maryland appears to represent an extremely large flux of energy. If a source at the center of our galaxy were radiating at this rate in all directions, it would have destroyed all the matter in the galactic center before now.

Explanations of Weber's results in which the radiation prefers certain directions are therefore under discussion. One candidate is gravitational synchrotron radiation. Electromagnetic synchrotron radiation is a well-known phenomenon that occurs when a charged particle moves in a circular orbit at relativistic speeds. Most of the radiation goes into very narrow angles about the plane of the orbit.

In the April 10 *PHYSICAL REVIEW LETTERS* an argument that gravitational synchrotron radiation is possible in Einstein's general relativity theory is presented by a group from the University of Maryland led by C. W. Misner. Their calculations are for a body moving in orbit around a black hole. They find that it will emit gravitational synchrotron radiation into limited angles at frequencies that are high harmonics of the orbital frequency.

Still no cosmic antimatter

The discovery of a piece of antimatter in the cosmic rays would confirm a principle derived from accelerator experiments: that there should be equal amounts of matter and antimatter. But despite searches, astronomers have never found evidence that the macrocosm obeys this equation.

Because antiprotons can be produced in the atmosphere, it is less ambiguous to look for antinuclei, helium or heavier. Observation had found no antinuclei among low-energy cosmic rays, but reasoning that high-energy ones would have a better chance to get through, a group at the University of California (A. Buffington, L. H. Smith, G. F. Smoot and L. W. Alvarez of the Space Sciences Laboratory and M. A. Wahlig of the Lawrence Berkeley Laboratory) looked for high-energy antinuclei with a new magnetic spectrometer that they flew on balloons.

In the April 14 *NATURE* they report that they found none, and that they have set a more stringent upper limit on the presence of antimatter than previous work: If antimatter is present there can be no more than one antinucleus to about 3,000 particles in some parts of the spectrum, one to about 90 in others.

Consequences of a massive neutrino

It is being seriously suggested that neutrinos may have a small rest mass (SN: 2/26/72, p. 138). In the April 10 *PHYSICAL REVIEW LETTERS* Saul Barshay of the University of Copenhagen points out that this could mean that the K_L^0 meson could decay into a neutrino and an antineutrino, something forbidden by the usual theory of zero-mass neutrinos. The possibility of such a decay has important repercussions in the theory of basic symmetries in particle physics, the theory of the weak subatomic force, and the possible existence of a fifth or superweak force. Barshay challenges experimenters to find ways to show that it doesn't happen.