Urban Environment

Hope for the cities

The oppressive ghetto filth, the sterile, characterless features of office buildings and the ubiquitous stalking danger that characterize so many of today's cities may finally be changing, say the authors of an article in June TECHNOLOGY REVIEW. Based on their own experience in Boston, and on statistics gathered from other cities, Alexander Ganz of the Boston Redevelopment Authority and Thomas O'Brien of the Massachusetts Office of Planning and Management conclude that a "fundamental change in the livability of our cities is beginning."

Manpower training, social services, housing and urban renewal have helped, they say, but fundamental changes in the country's economy and demography are driving the urban resurrection. A massive shift away from manufacturing toward a service-oriented economy is benefiting the urban environment. As the great population bulge of "war babies" leave the teenage years for the responsibilities of young adulthood, crime is expected to drop sharply. The exodus of rural poor from the South and Puerto Rico—which spawned so many of the present urban unemployment problems—is slowing, as those geographical areas also undergo an economic revival. Decreased migration should allow job-training programs to make real headway in preparing minority citizens for better-paying, service-oriented jobs.

Though such changes may drastically improve the condition of city life, they also bear a subtle danger, the authors conclude. Unless housing costs are kept in line with increasing minority incomes, the hard-core poor may simply be pushed out—dispersed into invisibility—with the cities left only to those who can afford the high cost of living in them.

Successful public housing

When slums are leveled and their tenants moved to new, publically financed housing, the results have too often been well-publicized disasters: The housing complexes can turn into slums faster than the originals did. Two studies conducted for the Urban Institute, and reported in the current issue of the institute's SEARCH, explore ways of halting this insidious process.

First recommendation—don't just throw money at the problem. The studies found that high operating costs were usually correlated with low performance ratings. The secret of success, the researchers concluded, is a combination of firmness in enforcing housing rules and a concerned responsiveness in trying to meet residents' needs, especially by providing prompt maintenance service.

The Smithsonian owls (part 2)

Like a moment of levity on the battlefield, the smallest invasion of nature into the malevolent urban wasteland may be hailed with disproportionate celebration. No wonder this month's SMITHSONIAN magazine should devote a two-page spread to announcing the birth of six owlets to the pair of barn owls introduced earlier this year into the ancient turrets of the Smithsonian Institution's venerable "castle" (SN: 5/18/74, p. 321). One of the six owlets vanished, but the other five are already learning to fly and soon should be learning how to catch the rats that have proliferated along the Mall following a pesticide ban. Reflecting on the littered city landscape and a year of Watergate headlines, Smithsonian Secretary S. Dillon Ripley declares the coming of the owls was "by far the most heartening thing that has happened in Washington this past spring." No argument.

Physical Sciences

Black holes by the billions?

Black holes, if they exist, are theoretically supposed to be the last stage of stellar evolution, the result of the collapse of a star under its own gravitation.

The theoretical picture of a binary involving a black hole and a normal star envisages a stream of matter leaving the normal star and falling into the black hole. As that matter falls, it is heated and gives off gamma rays. G. H. Dahlbacka, G. F. Chapline and T. A. Weaver of the Lawrence Livermore Laboratory have calculated what the spectrum of such gamma rays should look like. In the July 5 NATURE they suggest that if there are a large number of black holes around, they will collectively make an observable contribution to the background flux of gamma rays in the sky.

Black holes in our galaxy would cause a peak in the gamma-ray spectrum at an energy of about 18 million electron-volts. Those from other galaxies would cause a peak at a lower energy because cosmological redshifting would affect their emanations. A peak has in fact been reported at about 10 million electron-volts. If this is due to black holes in external galaxies, the Livermore group calculates that it requires about 10 billion black holes per galaxy if the mass of each is about 30 times that of the sun. In our own galaxy the limits on gamma-ray emission from the galactic center at energies above 15 million electron-volts indicate 10 million black holes.

Questions about the cosmic rays

Particle physicists are in the process of learning what happens when hadrons (the proton, neutron and related particles) strike other hadrons. When these results are applied to the cosmic rays an unusual situation results, reports Robert K. Adair of Yale University in the July 8 PHYSICAL REVIEW LETTERS.

When primary cosmic rays coming from whatever their source may be out in the cosmos strike the earth's upper atmosphere, they interact with atomic nuclei to produce secondary particles. If physics is universal, what happens in these collisions should be governed by the same rules as hadron-hadron collisions in the laboratory.

But when Adair makes the calculation based on present ideas of the composition of the primary cosmic rays, the ratio of hadrons to muons in the secondaries comes out not as observed. Adair concludes that either the ratio of charged to uncharged particles in the primaries is not as currently assumed or something is fishy about our knowledge of hadron interactions.

Sparking meson production

Sometimes when two hadrons collide, it happens that mesons are produced. A theoretical picture of such meson production is suggested in the July 1 PHYSICAL REVIEW LETTERS by Alfred S. Goldhaber of the State University of New York at Stony Brook. He bases his idea on the belief that hadrons are made up of constituents called quarks. In such a collision, he says, one quark in one hadron interacts very strongly with one quark in the other. This interaction produces what he calls a meson spark, a phenomenon similar to an electric spark but representing a so-called meson field rather than an electric field. After the hadrons have passed out of the way, the spark articulates itself into observable mesons. The picture allows Goldhaber to predict that in a very few cases such collisions will produce a large number of mesons.