environment sciences

Urban environment—bigger not better

Plato thought that the optimal size for a city would be 5,040 "people" with about five times as many slaves. Richard Lamm does not necessarily agree, but in *Equilibrium* he reports an impressive array of difficulties that worsen as cities become very large.

In cities of less than 50,000, for example, education can be provided for children at a cost of $12 per capita, for the community. That figure doubles for cities between two to three hundred thousand population, doubles again for cities of about half a million, and rises to $85 per capita for cities of a million or more.

Similarly for crime. There are 12.8 robberies per hundred thousand population in cities of less than ten thousand, 117.6 robberies per hundred thousand in cities of over 250 thousand population. Meanwhile, the per capita cost of police protection—though apparently less effective—also roughly doubles.

Other figures: A 100-fold increase in population requires a 1,200-fold increase in roadways. Public health is twelve times more expensive per capita in cities of over a million than in those of less than 50,000. In the same situation, welfare costs the average citizen 88 times more, through taxes, in the larger city.

Attempts at local solutions, Lamm reports, often only make the problem worse. Detroit, for example, a few years ago tried to open up 50,000 new jobs, only to find its unemployment rate rose slightly as a result—people seeking jobs had flooded in from other parts of the country.

Only a national program of population and employment coordination can really ease the problems of big cities, Lamm concludes. Such a program should find ready public support, he says, citing a Gallup Poll that shows 56 percent of Americans would prefer a rural life, if they could have it, 25 percent would choose suburban living, and only 18 percent want to spend the rest of their lives in a city.

Just the vampires

Long plagued by vampire bats that weaken their cattle and spread diseases, Latin American farmers may have been given a new weapon to use the bats' bizarre feeding habits to kill them, while harming no other animals, including other beneficial bats.

Reporting in INFECTIOUS DISEASES, a team of researchers from the Denver Wildlife Research Center describe a simple procedure they have used successfully to destroy whole colonies of vampire bats at a time. By smearing an anticoagulant, called heparin, on cattle or on captured bats, the farmer lays a subtle trap for the blood-sucking animals. As the bats bite the cattle or groom each other, they injest the heparin and soon die of hemorrhage.

Vampire bats kill about one million cattle each year in South America and are a major source of rabies. By introducing this selective poison, U.S. AID experts feel they can protect lives of men and cattle without disturbing the local ecology.

Run-off water pollution

The Environmental Protection Agency says run-off water from city streets during periods of moderate rain, may be more of a pollution hazard than a city's sewage, introducing significant amounts of lead, zinc, other heavy metals and pesticides into nearby rivers. EPA is expected to assign demonstration grants to control this pollution and to require consideration of run-off in future waste treatment plans.

aerospace

Skylab: On earth alert

Skylab astronauts can expect to see 10 major volcanic eruptions, 5 or more cyclones, as many as 10 floods and the topographic results of about 5 earthquakes during their five months in earth orbit, according to Robert A. Citron, director of the Smithsonian Institution's Center for Short-Lived Phenomena in Cambridge (SN: 4/7/73, p. 230). During the week of launch (May 15), the astronauts will be eyeballing the Mississippi flood area. Its major tributaries are expected to peak that week. The crew's systematic observations and photography will provide information about the rate at which the water recedes and the total area flooded.

The center has an agreement with NASA to transmit daily reports of major events on the surface of the earth. These events will be teletyped daily to the astronauts. In turn, astronaut sightings will be relayed to the center for transmission to some 3,000 scientists world wide. The handheld photography from space will complement the six multispectral instruments housed in the Earth Resources Experiment Package (EREP) on Skylab (SN: 5/5/73, p. 294), as well as imagery from the unmanned earth resources satellite now in orbit.

Star watchers: Skylab visible

Skylab will be the brightest star in the sky and visible from earth in clear skies during the two hours before dawn and after dusk. It will be moving in an easterly direction fast enough to be distinguishable from stars. It may be visible for as long as seven minutes.

Marshall Space Flight Center in Huntsville, Ala., will issue periodic information to key cities around the world about when and where to look.

Galileo crash: Human error

The joint Navy-NASA investigation board announced last week that human error was the cause of the April 12 collision of NASA's research aircraft Galileo, a Convair 990, with a Navy P-3 Orion. The crash killed 16 persons and brought to a temporary halt the airborne science program at the Ames Research Center (SN: 4/21/73, p. 256).

"There is no evidence," the report says, "that either pilot or the [control] tower personnel were aware of the pending collision." The Navy air controller "mistakenly" told the Galileo to land on the same runway that had been cleared for the Navy plane.

Brazil: Heavy on space

Brazil is one of the more enthusiastic supporters of NASA's international space agreements; it has a lot to gain, for example, from earth resources imagery taken over its sprawling territory. Last week NASA announced the extension of one existing agreement with Brazil and the initiation of another cooperative project.

The former is an agreement with the Brazilian Institute for Space Research to continue the experimental project in remote sensing. The extension will focus primarily on use of Earth Resources Technology Satellite (ERTS-1) results.

The second agreement is a joint sounding rocket project to measure the infrared emitting layers in the upper atmosphere between 60 and 300 miles. NASA and the Air Force Cambridge Research Laboratories will provide the Castor-Lance sounding rocket, scientific payload and ground equipment. Brazil will provide its equatorial launch site near Natal. The launch is scheduled for around May 24.