

railroad systems, suggesting that almost anything else is cheaper, even if it is less convenient.

Lots of people favor the automobile as the optimum commuting device, but not necessarily in its present form. If traffic gets much worse without something being done, drivers could be driven in sheer self-defense to one of the various "safety cars" that have been announced from time to time with only a condescending nod toward Detroit.

Perhaps the best known is the one created by the Cornell Aeronautical Laboratory, Buffalo, N.Y. It has been designed, redesigned, tested and fussed over for years, and a roadful of them ought to protect even oblivious holiday motorists from their common foe: each other.

Every possible exposed surface is padded, the visors collapse, the windshield pops out, the steering wheel collapses and most importantly, the car is built like a tank. In fact, that is a pretty good description of it. "Forward Looks," "Futuramics," "Dyna-sweeps," and other esthetic debaucheries have been completely ignored, and the vehicle is designed with one thing in mind: to keep its driver alive.

Another such vehicle makes at least a token effort to appeal to the eye. This is hardly surprising, however, since it came from the drawing board of Pininfarina, the Italian coachbuilder responsible for many of the world's most exotic looking automobiles, including a long string of Ferraris.

Pininfarina's car achieves its modicum of appeal at the expense of some protection. The Cornell vehicle's chassis and frame are most strongly stressed and braced in the places that are most likely to need it. This is only partly true for the Italian vehicle, though padded ceilings, shoulder harnesses, multiple door locks and other features are common to both cars. As a result, while you may stand a better chance of walking away from a 10-car rush-hour crack-up if the cars are the Cornell model, you are more likely to buy the less safety-oriented Pininfarina machine.

Down With Drivers

All right, if so many people are concerned about driver-caused accidents, let's take control of the car away from the driver. By this time, almost every highway engineer in Detroit has discussed automatic highways with cars following signals radiating from cables buried beneath the pavement. Such a system would make it relatively easy to control traffic spacing at peak rush hours, without so much as interrupting the commuter's perusal of the sports page.

Harry Chesebrough, Chrysler Corporation's vice president for product planning and development, envisions an automobile that is almost more like a space capsule. His commutermobile of tomorrow would be completely enclosed, air-tight, with its own controlled atmosphere. It would run on battery power, but instead of a gasoline engine, the battery would be fed by solar cells or chemical fuel cells, perhaps similar to those aboard the Gemini spacecraft.

In case the battery runs down anyway, it could be recharged through a socket on the

front of the car. The motorist would simply drive the car onto a prong protruding, for example, from the garage wall. "This operation," says Mr. Chesebrough, "is compatible with the evident preference most people have to park their vehicles by running into some barrier—such as the other fellow's bumper."

Instead of highways, he sees the car running in tunnels, tubes or covered trenches, completely unruffled by the weather.

A Mind of Its Own

Fully automatic, driverless vehicles are not at all remote, at least in the case of mass transportation. London's first new subway in 50 years, a 10.5-mile line reaching from Victoria station to the northeast outskirts of the city, will be controlled by an electronic brain aboard the train. A coil on the front of the leading car will pick up impulses transmitted through the tracks and relay them to the brain, which in turn will do all the work of a human engineer, even braking differently for varying passenger loads.

The British are not completely confident of their train, however. A live motorman will go along for the ride in the cab, with the rather menial job of opening and closing the doors, as well as watching over the (electronic) brain.

President Lyndon B. Johnson's planned Northeast Corridor line has received considerable attention, as have various supertrains designed by railroads, steel companies, and the like.

One such train, originating, of all places, in the U.S. Navy's bureau of weapons, borrows ideas from monorail vehicles as well as ground effects machines, which ride a few inches above the ground on a cushion of air created by huge fans.

Bernard Smith, technical director of the bureau, suggests a train that rides over a single rail, but is held slightly away from the rail by an "air-layer" that both filters out bumps and eliminates friction. A 200-mph train with no bumps, rattles or . . . just imagine speeding along, counting the telephone poles, without the sound of the breaks in the ties. Such trains, says Mr. Smith, could easily displace present intercity air shuttles such as those between Washington, New York and Boston, or between Los Angeles and San Francisco.

Commuting is changing. The commuters themselves, the means of transportation—but even the destinations are shifting, so that now large, multi-city areas are replacing small districts of cities. As Mr. Halaby sees the Northeast becoming one huge metropolitan complex, so most of the state of California encompassed between Los Angeles and San Francisco may merge in the future. United Airlines and Stanford University are jointly studying these changing patterns, but the trends are already clear.

Of course, tomorrow's world of communications may bring business associates so close together that transportation is almost unnecessary. And then where will the commuter be?

• Science News Letter, 89:139 February 26, 1966



Northrop Corporation

WINGLESS FLYER—A new vehicle, called a lifting body, achieves flight by its tri-finned configuration alone, eliminating the need for wings. Milton Thompson, chief test pilot for the National Aeronautics and Space Administration, is visible through the clear plastic nose cone. The craft will be used to determine potential problems of future spacecraft after reentry.

SPACE

Scientists Should Visit Planets or Hover Nearby

► IF SCIENTISTS CANNOT actually land on the moon or planets to make direct observations, they should be in a spacecraft orbiting as nearby as possible, a National Academy of Sciences-National Research Council advisory group reported in Washington, D.C.

The Academy's Space Science Board investigated the relative merits of training scientists as astronauts, or astronauts as scientists. Its members concluded that for tasks where technical know-how or observation is important, suitably trained astronauts could do these jobs.

However, looking farther into the future than the Gemini earth-circling orbits and the Apollo manned moon flights, the board concluded that now is the time to consider training "scientist-passengers" for space crews. The board recommended gradual relaxation of the stiff medical requirements for a scientist-passenger "to the point where a candidate would be disqualified only for defects that would make him a hazard to the mission."

The board, noting that man is essential in space exploration, called for the development of a series of manned orbiting research laboratories carrying six to eight men, some of whom would be medical experts. It also urged placing "modest" scientific experiments on the Gemini and Apollo vehicles.

• Science News Letter, 89:139 February 26, 1966