

equivalent to two eggs a day. The remaining group did not receive supplements.

The pigs were fed these diets with or without supplements for eight months, then were slaughtered. The levels of cholesterol in their blood and the amount of cholesterol in their aortas (the artery that takes blood from the heart and distributes it throughout the body) were measured. The degree of hardening of the arteries was also determined.

The pigs fed the margarine fat had the highest cholesterol levels and the greatest degree of hardening of the arteries. The aortas of seven out of twelve (58.3 percent) of the pigs fed the oil had bumps in their arteries (the first symptoms of hardening of the arteries); bumps for the rest of the pigs appeared in only 14 percent of them. The next group with the most hardening of the arteries were pigs fed the mixture of fat and sugar, but the figures dropped markedly. Only three out of twelve had aortas that showed hardening. No elevation in total blood levels of fat or cholesterol was noted in the pigs fed the basic diet or the basic diet supplemented with crystalline cholesterol, powdered egg yolk or powdered whole egg. Aorta damage was also less than for the other groups.

"No explanation," Kummerow admits, "is presently apparent for the

observation that a significantly higher percentage of raised lesions was noted in the aorta from swine fed trans [altered] fat as compared to those fed saturated fats or a dietary source of cholesterol. That the addition of cholesterol to the diet of rabbits increases their plasma cholesterol level is well known. However, such an elevated effect has not been observed in swine. Therefore, swine seem closer than rabbits to human subjects in their response to a source of dietary cholesterol."

What these findings mean for the public, Kummerow says, is that margarine that contains trans-fatty acids is more likely to cause hardening of the arteries than are cholesterol-rich animal fats, such as butter, or cholesterol-rich foods, such as eggs. Some American margarines have been found to contain as much as 36 percent trans-fatty acids. Canadian and European margarines prepared from hydrogenated fish oil and rapeseed oil contain an even higher level of trans fats.

"We can't say which margarines are worse and which are better because the trans content is varied from time to time," he says. "However it is possible to provide trans-free margarine to American consumers. One large international firm is providing such a margarine to their customers in Europe; they should also do so for their customers in the United States." □

Blow up: Removing the people mover

Such a deal! For only \$13.4 million I can get you the perfect people mover. It will have 3.2 miles of elevated guideway on which 90 fully computerized, 21-passenger capsules will efficiently whisk people to and from their destinations at the push of a button.

The Federal Urban Mass Transportation Administration (UMTA) bought this spiel in 1969 when enthusiasm ran high for alternate modes of mass transportation. It proceeded to spend \$57 million on a prototype people mover.

Where was the money spent? In New York where construction of the Second Avenue subway could serve millions of people? No. The people mover was built in Morgantown, W. Va., on the campus of West Virginia University. This happens to be in the home district of Rep. Harley O. Staggers (D-W. Va.) who, as chairman of the House Commerce Committee, has a lot to say about the Department of Transportation's budget.

After five years of engineering delays, cost overruns, politicking and assorted red tape, all the Transportation Administration has to show for its money is 2.2 miles of track, five test vehicles and three, instead of six, stations. Now,

the Government is thinking about blowing up the whole mess.

Why does anyone want to dynamite the people mover? Because it will cost at least another \$50 million to complete the system that was supposed to be carrying passengers in 1972. Three weeks before the 1972 election, Mrs. Edward F. Cox, the President's daughter, dedicated the system with much fanfare as a shining example of the Administration's progress in mass transportation. Shortly thereafter, the Administration imposed a one-year moratorium on major work on the system.

UMTA has recently tried to divest itself of this white elephant. It tried to give it to the University of West Virginia but the university doesn't want it. As it stands, the people mover has too little track and too few stations and cars to be of any practical use on the campus. The portion that is completed probably will not work properly because of engineering short cuts and, even if it does, the university does not have the money to operate it.

Engineers are now trying to properly estimate the cost of destroying the people mover. □

Mercury: Revising the textbooks?

Just as Jupiter seems to provide back-looking planetologists with an atmosphere that reflects the earliest days of the solar system, Mercury may be offering them a surface that still shows traces of its formative years. If this is true, there is just a chance that Mercury may rewrite the textbooks on the way in which the planets were born.

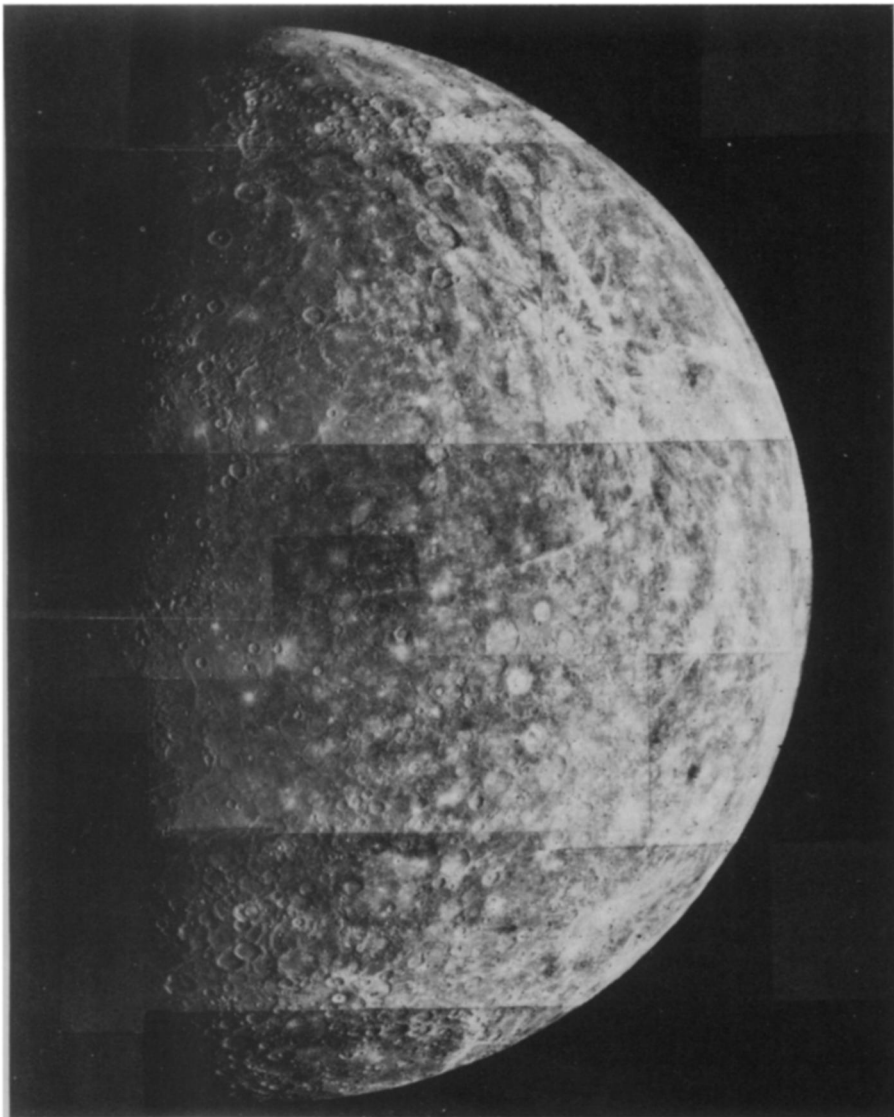
From the reams of data collected by Mariner 10, two findings are the keys to what could be one of the most important discoveries since earth-spawned space probes began visiting other worlds. One is the observation that Mercury has an outer layer of lightweight, moonlike material, which, because of the planet's high overall density, argues for a heavy iron core (SN: 4/6/74, p. 220). The other is the possibility, suggested by Bruce Murray of the California Institute of Technology, that much of Mercury's original surface is still showing.

The ranking theory of how planets evolve has long been that they condensed from concentrations in a primordial gas cloud. Then, once they had accreted, or come together, but while still in a largely liquid state, the heavy elements such as iron sank to the center while lighter ones rose to the top. This sorting process is known as differentiation.

The alternative posed by Mercury is iffy at best, but it contradicts such a fundamental part of planetology that it could be foolhardy to reject it out of hand, though even Murray points out that Mariner 10's data merely provide some justification for considering the alternative.

The idea is beguilingly simple: If Mercury is a differentiated planet with its original surface still on top, perhaps the differentiation took place as it formed instead of afterward. Otherwise the original surface would presumably have been plowed under.

The critical factor is whether much of the surface photographed by Mariner 10 is indeed original. There are definite signs of lava flows suggesting volcanic activity, and long, not-too-twisted cliffs and fissures pointing to a planet with at least a somewhat active history. But, says Murray, there are no signs of substantial atmospheric erosion or of worldwide crustal shifts like the plate tectonics of earth. Perhaps some original surface does remain. In fact, because the radioactive elements that provide much of a planet's internal heating are more likely to end up among the rocks at the top than among



Mariner's outbound view shows smooth, moonlike maria and huge meteorite scars.



Cliff scars Mercury's fossil landscape.



Small events such as lava flows, rather than global cataclysms, appear the norm.

the metals underneath, it is conceivable that a planet that had its iron core from birth might have fewer deep energy sources, so that its volcanic

events might be smaller and less surface wrenching.

The newcomer is tempting, but the old standby theory has some logic on

its side too. Mercury certainly has a moonlike look, acknowledges John O'Keefe of NASA's Goddard Space Flight Center, and radar measurements of the dielectric strength of the surface suggest similarly iron-free rocks. But if there is no iron, where did it go? The elements that came together to form Mercury and the other planets were in a gaseous state at the time, and, says O'Keefe, it is far more difficult to separate light and heavy elements as gases than as molten liquids. Since iron was there at the beginning, it must have disappeared from the surface afterward, by differentiation.

As theorists take sides, the Mariner 10 scientists live in growing frustration as a demanding schedule of scientific conferences keeps them busy presenting their data rather than staying in their laboratories analyzing it. Furthermore, Mariner's findings may have to suffice for a long time, since NASA's next Mercury flight is not scheduled until 1987. □