

that the moons are dark enough to be made of water-rich carbonaceous chondrite material, which probably could not have formed as close to the sun as Mars (although, points out Joseph Veverka of Cornell University, the color distinctions involved are subtle enough that earth's moon, by comparison with a carbonaceous chondrite, is considered "red-dish").

Still stronger evidence may come early next year during Viking's post-solar-conjunction "extended mission," when flight officials hope to send one of the orbiters to within 30 kilometers of Phobos. The satellite's gravitational effects on the spacecraft's orbit should enable precise calculations of its density, revealing whether it is more like the 2.0 grams per cubic centimeter of a carbonaceous chondrite or the 3 to 3.5 grams of basalt.

If Phobos and Deimos were indeed formed elsewhere and captured, says Veverka, it is likely that they were captured while both were still part of a much larger object which later broke up, with the remaining fragments crashing into the planet or escaping into space. It would take a large object, he says, to produce strong enough tidal interactions with Mars to produce the present circular, equatorial-plane orbits that neither moon would be likely to have achieved on its own. If the two have different densities, however, it would suggest either two separate captures of larger objects or that circular, equatorial-plane capture is easier than now believed. □

Swine flu vaccine: Facts vs. fears

On Oct. 1, after extensive birth pains and controversy over its necessity, the swine flu vaccination program got underway throughout the United States. But its success was short-lived. On Oct. 11, three elderly persons died within 48 hours after receiving the vaccine at a Pittsburgh clinic. As a result, vaccination was suspended in a few states. By Oct. 13, some 35 older persons in 17 states had died within 48 hours of receiving the vaccine. The Center for Disease Control in Atlanta attempted to determine whether any of these deaths was due to the vaccine.

By Oct. 18, the CDC concluded that none of the deaths could be blamed on the vaccine, and the vaccination program moved ahead full tilt once again. However, many Americans, particularly older persons, have remained skeptical about the safety of the vaccine. Precisely what are the scientific facts behind the scare?

Although some 35 persons age 65 or older died within 48 hours after getting the vaccine between Oct. 1 and 13, there were almost a million other older Americans who also got the vaccine during that period and suffered no serious effects. Statistics from CDC show that 116 elderly

Americans out of one million usually die every 24 hours under normal circumstances, suggesting that there was no connection between the vaccine and the deaths. In fact, the statistics suggest that there were considerably fewer deaths among those older persons getting the vaccine than among those who did not get it. Or in the words of Robert Webster, a flu vaccine scientist at St. Jude's Children's Research Hospital in Memphis, "If you want to play the numbers game, you can play it the other way around, that is, that the flu vaccine protects you from dying."

Webster doesn't really believe that, though. Then why were there actually fewer deaths among older vaccine recipients than among older nonrecipients? "Because the people who are really sick and in bed are not going to receive the vaccine," Webster suggests.

There is other evidence to exonerate the vaccine. Of the 35 deaths, 20 were the result of heart attacks; seven were the result of miscellaneous cardiovascular problems, and the others the result of diabetes, respiratory failure, lung embolism and lung hemorrhage. None of them were diagnosed as the result of flu, especially swine flu. These findings do not surprise flu vaccine scientists. All the flu vaccines that have ever been commercially available in the United States, including the swine flu vaccine, are made from killed flu viruses. None has ever been known to cause the disease it is supposed to guard against, attest both Webster and Robert Golasso, chief of the Infectious Disease Branch of the National Institute of Allergy and Infectious Diseases. The case is different for vaccines made from attenuated live viruses, such as the polio vaccine. Such vaccines have, on rare occasions, triggered the disease they were supposed to prevent (SN: 10/2/76, p. 213).

Although a killed virus vaccine cannot cause the disease it guards against, it might, of course, contain some chemical contaminant that could trigger disease. But CDC officials were not able to find any evidence of such material in vaccine batches. And whereas vaccines sometimes provoke allergic reactions in persons who are allergic to eggs or egg protein, autopsies of the Pittsburgh vaccine recipients who died did not show evidence of such reactions. Also, allergic reactions to vaccines have never caused a death as far as Webster can recall.

Nor is it likely that the vaccine stressed older persons so badly that they died from the stress. As Robert M. Alden, a CDC spokesman points out, heart attack patients probably get more shots than healthy persons, so it is hard to imagine that a shot of vaccine would stress them anymore than, say, a shot of antibiotic. Golasso, however, concedes that traveling to a clinic for vaccination could be so stressful for sick, elderly people that it

might have triggered some of the deaths that followed vaccination. Indeed, one elderly man died even before he was vaccinated—while reading a vaccination consent form. "No one has ever connected a heart attack with a vaccine," Golasso asserts. "Now stress, that's something else."

So taking these various factors into consideration, it is the consensus of the vaccine authorities both in and out of the CDC that the swine flu vaccine has not caused any deaths to date. □

Brain asymmetry present at birth

The intricate workings of the brain's 10 billion cells will not be explained in the near future, but during the past 10 years there has been an explosion of information relating the workings of the brain's two hemispheres to some basic human behaviors. It is now fairly well established that the left hemisphere functions predominately in language-oriented activities while the right hemisphere possesses superior spatial-perceptual capabilities. When and how does the brain develop this lateralization and specialization of hemispheric functioning? This was among the questions addressed this month at a conference on the evolution and lateralization of the brain sponsored by the New York Academy of Sciences.

In the early 1960s most of the evidence suggested that the two hemispheres are virtually equal in potential with regard to the acquisition of language, at least until the age of two. In other words, the hemispheres start out the same and then differentiate as language is acquired. Juhn A. Wada of the University of British Columbia in Vancouver now says, "It cannot be assumed that the two hemispheres are equally potential for speech at any time." Wada suggests instead that the left hemisphere is prepotent or predisposed for language development at least from birth. This conclusion is based on studies of both the structure and function of infant brains.

It has long been known that adult brains are morphologically asymmetrical, and Wada's examination of more than 100 infant brains now confirms similar asymmetry in infants, with the left side usually larger. These asymmetries are inborn, says Wada, and are not due to environmental or developmental factors after birth. They are present and visible at the twentieth week of gestational age and can be measured objectively by the twenty-ninth week.

What does such morphological asymmetry mean? Are the asymmetries coincidental? Do the larger areas represent underlying speech mechanisms or do they represent capabilities other than speech? "Unfortunately," says Wada, "the extent of our understanding of these perplexing problems is practically zero at this