

mesons and pi mesons) were of such high energy that when struck against a copper target they produced some of the newly discovered psi particles. From the results it appears that antiprotons, K mesons and pi mesons are six times as useful as protons in producing psi particles. One interpretation is that these particles contain antiquarks—protons, according to theory, do not—and the collision of an antiquark in the incoming particle with a quark in the target is an efficient way to make psi particles.

The second experiment also deals with

a trendy topic—interactions of neutrinos at high energy. Four months of data taking have yielded 53,000 neutrino interactions and 15,000 antineutrino interactions. Of these, 300 belong to the rare and fascinating category that includes a pair of muons in the final products of the interaction. Such “dimuon” events are thought to be related to the production of theoretically predicted, but heretofore unseen, species of particle. The claim is made that the accuracy of the CERN dimuon data is far greater than that of the dimuon events so far recorded in the United States. □

## Bloodless surgery saves heart victim

In what is believed to be the first operation of its kind in the United States, a Washington, D.C., area man was drained of his blood supply for 37 minutes while doctors repaired a tear in the arterial wall of his heart. In addition, the body temperature of 43-year-old Eugene Tison was lowered to 60°F for the operation, in which the damaged portion of the aorta was replaced with a Dacron tube.

Tison, an employee of Voice of America, suffered a dissecting aneurysm while bowling June 1. The dissection, or splitting, of a portion of the aorta forced blood to flow in two channels, instead of one, between the aorta's inner and outer layers. The heart is hard pressed to continue pumping under such an abnormally heavy work load, and Tison's life was threatened by massive internal bleeding.

Washington Hospital Center surgeons Luis Mispireta and Jorge Garcia sewed the tear, but blood continued to seep through another section of the aortic wall. The walls had been so weakened by Tison's struggle over the previous 18 hours, the doctors reported last week, that the surgical clamp had torn a fresh hole in the wall. It was apparent that another portion of Tison's sopping, flimsy aortic wall needed to be repaired and that the rest of the artery could probably not again stand up to the clamping involved in conventional, open-heart procedure. Mispireta and Garcia quickly decided to attempt the radical, blood-draining procedure.

Tison's body was cooled to about 60 degrees, effectively stopping all body functions and temporarily postponing its need for blood. The surgeons drained the body's full supply of blood for 37 minutes while they replaced the damaged aortic section with a four-inch Dacron tube. The brain was sustained during that period by the oxygen contained in residual pools of blood attached to the surface tissue. However, there was no blood pressure and no moving blood supply during the 37 minutes. Blood was then pumped back into Tison, and in the 50 minutes it took to get his body temperature back to normal, the surgeons finished suturing the synthetic tube to the remaining healthy sections of aorta.

Dopamine hydrochloride was injected into the bloodstream to stimulate heart beat, and Tison was given sodium nitroprusside to keep his blood pressure down and maintain minimal stress on the aorta. Tison was discharged from the hospital

last week.

The doctors concede that the surgery—a combination of “profound hypothermia” and “total systematic arrest”—runs the risk of brain damage, or possibly death, but they said there was little alternative in Tison's condition. The body can tolerate such cold temperatures for about one hour, they added.

Similar body-temperature-lowering procedures have been performed in the past in certain types of spinal cord and brain tumor surgery—some for longer periods than in the Tison case. But Washington Hospital Center officials say they believe this may be the first instance anywhere, and almost certainly in the United States, where the cooling and blood-draining technique has been used in open-heart surgery.

Doctors believe that dissected aneurysms may be hereditary. Tison's father died 43 years ago of what his mother was told was a ruptured blood vessel. □

## Olfactory synchrony of menstrual cycles

Six years ago, a young Harvard psychologist made a startling discovery: Martha K. McClintock, studying a group of coeds in a suburban Boston college dormitory, found that roommates and close friends experience menstrual synchrony to a significant degree. Suddenly, it became clear that social interaction could affect women's menstrual cycles, just as it influences them in mice, monkeys and other creatures.

While this may have reduced “the noblest animal” a notch in some minds, it ignited countless curiosities. McClintock proved that the effect could not be due to food, common stress periods, awareness of menstrual timing or to the cycles of the moon and that the only significant factor seemed to be time spent in each other's company. But what transpired during that time together to cause the menstrual synchrony?

That question may have been answered this year by another young researcher, Michael J. Russell, of the Brain Behavior Research Institute at Sonoma State Hospital in Eldridge, Calif. Russell's major research interest is human olfactory communication, and he wondered whether the synchrony could be related to olfactory cues in women just as it's been shown to be in mice. His latest experiment, presented to the recent Pacific Division meeting of the American Association for the Advancement of Science in San Francisco, provides strong evidence that the McClintock effect is indeed related to the sense of smell.

Russell conducted his study at San Francisco State University where he is a guest lecturer in the psychology department. He chose 15 volunteers, ages 19 to 39, for his experimental and control group, and 1 “sensory donor,” a woman

named Genevieve Switz. She had a history of “driving” a friend's menstrual cycle—that is, the friend's became synchronous with hers when they roomed together in the summer and disynchronous when they moved apart in the fall. During the experiments, Switz wore small cotton pads under her arms for 24-hour periods and donated the accumulated perspiration to Russell. He, in turn, mixed it with a few drops of ethanol and applied it to the upper lip of the experimental subjects three times a week over a period of four months. Control subjects received applications of ethanol alone.

In January, the experimental subjects' menstrual periods started an average of 9.3 days away from the donor's starting day. By May, that “starting distance” had been reduced to 3.4 days. The control group, on the other hand, started an average of 8.0 days away from the donor in January, and by May, started 9.2 days from her—no significant change.

It might seem odd that Russell chose to use human perspiration rather than some other body secretion to supply the olfactory stimulus. Others such as saliva, vaginal secretions or even foot odor might have worked as well, he explains, and he would like to test each of them some day. But in a typical modern setting, perspiration odor seemed the likeliest medium of transfer for the chemical signal—if indeed a chemical signal existed at all—and thus he chose to test it.

What then is in the donor's and presumably other women's body secretions, that can influence menstrual cycles? “I don't know,” says Russell, “but that certainly is a prime subject for investigation.” In the meantime, though, he says his findings are a demonstration that odors can change the menstrual cycle. □