other two variables—HDL cholesterol and triglycerides — did not show any strong trends after adjustment.

Although the researchers indicate that this study suggests "at least a two-fold increase [among heavy coffee drinkers] in the risk of coronary heart disease," a spokesman for the National Coffee Association said "there is nothing in the current report that would substantiate [this]. The researchers focused on cholesterol, not heart disease," he added, "and failed to consider other factors known to affect cholesterol levels, such as dietary intake of saturated fat."

Basil M. Rifkind, chief of the lipid metabolism and atherogenesis branch of the National Heart, Lung and Blood Institute in Bethesda, Md., agrees that dietary fat intake should not be overlooked. He adds that "relationships of the magnitude that this group was reporting came as somewhat of a surprise" to him. "If coffee is raising cholesterol by that amount," he said, "one would expect it to show through as a definite risk factor for heart disease," and this has not been the case in previous studies. Still, he says, "this is a good group of investigators," and their findings of an association between coffee and cholesterol should not be taken lightly. Rifkind's group conducted a study of heart disease risk factors in the early 1970s, in which dietary information, such as coffee consumption, was recorded but not evaluated. Now he plans to re-evaluate these data to see if he can verify the coffee-cholesterol connection. —*P. Taulbee*

Schizophrenia clues in angel dust

The street drug called "angel dust," or PCP, is known to cause bizarre behavioral changes strikingly like those seen in schizophrenic psychosis—hallucinations, aggression coupled with extraordinary physical strength, catatonic rigidity. As a result PCP "psychosis" has for some time been used as an animal model in the study of schizophrenia. This week two Baltimore scientists announced that they have identified the pathway through which PCP affects the brain — a finding that could shed light on the brain abnormality underlying the severest of psychiatric disorders.

According to physiologist Mordecai Blaustein and pharmacologist Edson Albuquerque of the University of Maryland School of Medicine, PCP (short for phencyclidine) achieves its effects by altering the chemical activity in the membrane of neurons — a change that in turn prolongs chemical communication among cells and presumably distorts normal information processing. Specifically, they found that PCP alters brain activity by binding to a poorly understood molecule in the membrane called the potassium ion channel.

Under normal circumstances, Blaustein told Science News, a resting neuron contains relatively more potassium and less sodium than there is in the surrounding blood or cerebrospinal fluid. When the nerve is excited, the positively charged sodium leaks in through pores, called sodium ion channels, creating an "action potential" in the cell; this charge travels to the terminal, where it causes calcium to leak in and, in effect, order the release of chemical messengers. Finally, the positively charged potassium ions exit through their own channels, restoring normal charge to the cell and ending neurotransmission.

PCP binds to the potassium channel and blocks the normal flow of potassium, Blaustein says, and as a result it prevents the normal cessation of chemical firing into the synapse. Blaustein's results come from test tube experiments on rat brain tissue, but importantly, he notes, only PCP and chemical analogs that have demonstrable behavioral effects in living animals were found to block the potassium channels. Compounds with chemical structures very similar to PCP that do not affect behavior also failed to alter membrane activity or synaptic transmission.

Albuquerque had previously demonstrated that PCP binds to potassium channels in muscle-firing cells (a finding that could explain the great physical strength shown by those under the influence of angel dust), but this is the first time the same physiological effect has been seen in brain tissue. In addition, Blaustein says, they have found a way to radioactively label the potassium channels, which could make it possible to characterize the nature of the molecule.

The connection to schizophrenia is entirely speculative right now, Blaustein emphasizes, but the link between identifiable psychotic behaviors and a specific physiological abnormality could provide a useful lead. Schizophrenia is presumed to be related to abnormal neurotransmission, but it remains unclear which neurochemicals are involved. Blocked potassium channels, he says, could account for several synaptic abnormalities. —*W. Herbert*

Deciphering the history of ocean crust

Along the undersea ridge of the East Pacific Rise, which slashes like a gigantic wound along the seafloor, molten rock pushes up from the mantle to create ocean crust. The ridge is peppered with vents streaming heated waters laden with minerals leached from crustal rocks. That this hydrothermal process occurs today is clear; details of its history are not. Thus, when the drillship *Glomar Challenger* pulled out of Tahiti for its 92nd cruise in February as part of the Deep Sea Drilling Project, the scientists on board had several questions in mind.

One question is, over time, have there been changes in the rate of accumulation and composition of sediments altered by hydrothermal fluids? If they have changed, "that has very profound implications for the chemical history of the oceans," says Margaret Leinen of the University of Rhode Island in Kingston. She and David K. Rea of the University of Michigan in Ann Arbor were co-chief scientists of the cruise.

It is believed that every speck of ocean water circulates through the world-wide system of spreading centers every 10 million years or less, and that the rate of circulation and the accumulation of hydrothermal sediments varies directly with the spreading rate. The faster the crust spreads apart, the more cracking and fracturing occurs, allowing the seawater to percolate more rapidly through the crust. As more water circulates close to the buried cauldron of magma and back to the seafloor surface, more hydrothermal sediment is generated. Faster spreading would affect ocean chemistry because the reactions that take place when hydrothermal fluids react with basalt — molten material from the upper mantle — affect the ratios of many constituents of ocean water, including major ones such as magnesium and calcium.

During the cruise the *Challenger* drilled 19 holes into six sites in a line so that the ages of crust drilled increased with distance from the ridge. This path enabled the scientists to study how crust generated at the same location on the EPR varied with time. The drillholes spanned crust from 4.7 to 28.6 million years old. The researchers found that the sedimentation rates were higher than today's between five and eight million years ago, and again between 20 and 24 million years ago, but there are not yet enough data to allow conclusive answers about the past changes in ocean chemistry.

The researchers hope that the variety of experiments performed will reveal information about the spectrum of reactions at the vents. What controls the degree of alteration that takes place? What sort of solutions come out, and does this circulation continue even after the fractured crust has moved away from the spreading center?

Some answers may be provided by an experiment conducted at a hole drilled on a previous DSDP cruise. During the recent trip the *Challenger* returned to hole 504B near the Galapagos Islands, and a seismometer was emplaced in the hole. Seismic charges were set off nearby. The paths of the seismic waves may reveal the pattern and depth of cracking in the crust, indicating whether the hydrothermal activity goes on continually. Preliminary studies suggest that in the sea floor around the drillhole, the amount of fracturing varies greatly from one location to another. —*C. Simon*