

molecules at select sites. The discovery of such "restriction enzymes," in fact, earned a Swiss and two U.S. scientists the 1978 Nobel Prize in Medicine (SN: 10/21/78, p. 276). This is the first time that restriction enzymes have been used for medical diagnosis.

The new advance from Kan and company all started when they recently found that a specific DNA cutting enzyme, called Hpa I, cut the gene for the beta hemoglobin peptide chain out of DNA molecules in two different lengths. In other words, the enzyme would carve out the gene plus a few extra base sequences in one instance, and the gene plus numerous sequences in the other. What's more, the researchers found the shorter fragments were present in people without sickle cell anemia, both shorter and longer fragments in persons who carry the sickle cell trait and only longer fragments in individuals with sickle cell anemia. Why should Hpa I selectivity in chopping up a DNA molecule correlate with the presence or absence of a sickle cell gene? Kan and his colleagues aren't sure. They suspect that a gene probably also determines the receptor site at which Hpa I can go to work on a DNA molecule, and that this gene is usually inherited along with the gene for the beta hemoglobin peptide chain.

Whether true or not, though, the discoveries by Kan and co-workers prompted them to ask: Why not use the unexpected correlation between the sickle gene and longer fragments chopped by the enzyme to diagnose sickle cell anemia in fetuses? The researchers found the idea particularly attractive, since the link could be made in DNA taken from any kind of fetal cell, not necessarily fetal blood cells. (The reason is that each cell in a person contains all the existing genetic material, whether all of the material is expressed or not.) Thus, diagnosis of sickle cell anemia would be much safer than with the initial technique. They tested their idea and report that they have now successfully diagnosed two fetuses with it. Both were found to have the trait, not the actual disease. The technique has also been applied to two more fetuses; results are pending.

The technique works essentially like this: Amniotic fluid is drawn from the mother's womb, as in the usual prenatal diagnosis. Hpa I is put in the presence of DNA molecules taken from fetal cells in the fluid, and it chops up the DNA molecules. If all the fragments that result are short, it indicates that a fetus has no genes for sickled hemoglobin chains. If both shorter and longer fragments result, then the fetus is a carrier. And if only longer fragments ensue, then the fetus has the disease.

Before this method can be widely used, Kan and his co-workers must determine precisely how accurate it is. There are indications that the gene that decides whether Hpa I will cut a DNA molecule does not always correlate with the presence or absence of a sickle cell gene. □

Last days of the Condor?



National Audubon Society

Only 16 California Condors, the lowest count ever, were sighted October 17 and 18 in the annual Condor survey. Adult Condors can weigh about 20 pounds and have a wingspan of more than 9 feet. In an attempt to save North America's largest land bird from extinction, an advisory panel has proposed further research, a captive breeding program and preservation of Condor habitat.

An interaction by any other name

Ever since the famous polarized-electron experiment at the Stanford Linear Accelerator Center last summer (SN: 7/8/78, p. 20), a lot of physicists have been going around saying that there are no longer four classes of force in nature, but only three. The apparent success of what is called the unified field theory in putting together electromagnetism and the weak subnuclear interaction into a single description, which was so convincingly confirmed for many by the Stanford experiment, leads to a problem: what to call the newly unified interaction.

CERN COURIER reports that Abdus Salam, one of the people who started the work on the unified field theory, has been going around calling it "electroweak." This follows the historical precedent whereby the 19th century coined electromagnetism out of electricity and magnetism, but to those of us who do not enjoy Swiss efficiency at hydroelectric production, it sounds a little like a word to describe the air conditioning in New York City on a hot summer afternoon.

A friend of CERN COURIER's in Edinburgh

suggests going to the venerable tradition of using Greek roots and so coins "asthenodynamics" from the Greek "asthenis," which means not strong and could serve as antithesis to chromodynamics, the theory of the strong interactions, a class of force not yet in the net.

Now ideas that come from Edinburgh should be treated with respect, because the Higgs bosons, the particles that make so much possible in the unified field theory business, were thought up there. However, we would like to point out that physicists now have the habit of making up acronyms, even acronyms that aren't, like SPEAR and ISABELLE, and so we propose "ivbodyynamics" in honor of the intermediate vector bosons, the particles that carry the forces. When the unification proceeds somewhat further, we might call it higgbodyynamics, and for the last stage of all, there is only one word: "Neurasthenia." □

Cosmonauts return



Novosti

Commander Vladimir Kovalenok and Flight Engineer Aleksandr Ivanchenkov.

Far outlasting previous manned space flight attempts, Soviet cosmonauts Vladimir Kovalenok and Aleksandr Ivanchenkov returned last week after 140 days in orbit aboard the Salyut 6 space station. Their achievement, well timed for the 61st anniversary of Soviet power, surpassed the 96-day record set earlier this year by the Soviets and left the 84-day Skylab record in the dust.

But, according to Soviet news agencies, the cosmonauts were not just marking time. Kovalenok and Ivanchenkov hosted two other pairs of cosmonauts, including a Pole and an East German, and received three visits from unmanned Progress supply craft ferrying food, fuel and touches of home such as garlic and a guitar. Studies of crystal growth and the manufacture of alloys and optical materials under weightless conditions dominated the cosmonauts' research. Soviet sources say they produced materials with "new mechanical, electrical and thermal properties." Other studies, in cooperation with Poland and East Germany, included photographing those countries and the Soviet Union to track seasonal natural changes. □