

has been almost a cornerstone in many attempts to account for the instruments' responses by nonbiologic means.

Yet the latest PR results, says Levin, throw the whole peroxide model into question, suggesting that more exotic chemistries must be postulated if biology is to be explained away. Horowitz, he points out, has stated that Viking's labeled-release and gas-exchange data represent oxidative reactions, while the PR indicates a reduction. "However," says Levin, "those proposing the single-cause theory—peroxide—to explain all three instrument results had theorized that the peroxide reacted to produce intermediates or free radicals, which, in turn, were responsible for the reductions observed in PR." The water added to the latest PR sample, even though it was boiled off later, ought to have driven off the oxygen from the peroxides on the soil. This precludes the peroxide-produced intermediates or free radicals from being available to reduce the carbon dioxide or carbon monoxide to form the "organic matter" detected by the experiment.

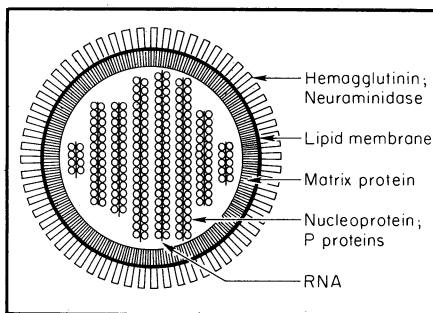
An alternative theory may be that the water merely reduces superoxides down to peroxides, leaving the reaction potential relatively intact. Gas-exchange experimenter Vance Oyama of the NASA Ames Research Center proposes this idea as part of a detailed model of Martian surface chemistry (NATURE, Jan. 13). But the case is far from closed. □

Soyuz 24 crew aboard Salyut 5

The Soviet Salyut 5 space station was successfully boarded last week by a second crew of cosmonauts—the third to make the attempt. Both of the previous attempts, last autumn, suffered considerable difficulties: The Soyuz 21 crew was forced to leave the station and return to earth prematurely because of difficulties with their spacecraft, and Soyuz 23 was unable even to dock with the station at all due to a malfunction of the Soyuz portion of the rendezvous system.

Soyuz 24 was launched on Feb. 7, carrying cosmonauts Victor Gorbato and Yuri Glazkov, who had also been the backup crew for Soyuz 23. (Gorbato had been in space once before, aboard Soyuz 7 in 1969.) The rendezvous and docking with Salyut 5 took place on Feb. 8, and the cosmonauts entered the station a day later. The goals of the mission have not been publicized beyond general references to biomedical experiments, earth-resources studies and the like. It has been reported, however, that both crewmen have been trained in extravehicular activity, and that in fact Gorbato was a backup crewman for two earlier missions (Voskhod 2 in 1965 and Soyuz 5 in 1969) that included such "spacewalks." □

Fine dissection of virus: No pandemic

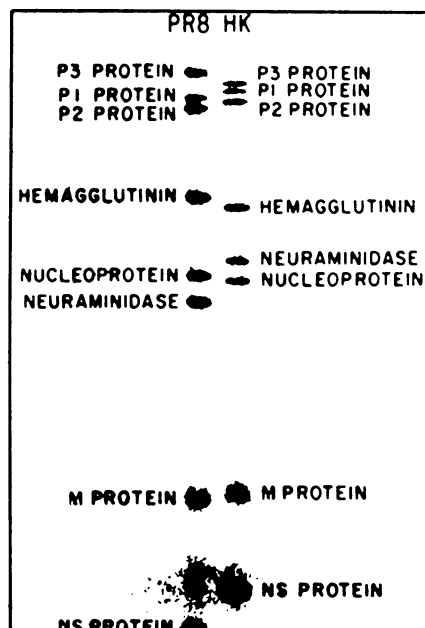


Influenza A virus: Sphere with spikes

The New Jersey swine flu virus is unlikely to cause the next influenza pandemic, say researchers at Mt. Sinai Medical School. Their prediction is not based on the epidemiology of influenza, but on the exact composition of the swine flu virus.

At the Gustav Stern Symposium on Perspectives in Virology last week in New York, Peter Palese described techniques, developed with Jerome L. Schulman and Mary B. Ritchey, that allow a close look at the genes and proteins of influenza viruses. The influenza genes are separate segments of RNA. When the researchers compared the eight genes of different flu viruses, they found that the New Jersey influenza closely resembled the influenza that infects swine. None of the genes appeared to be from the type A influenza virus that most commonly infects humans. The New Jersey virus thus does not fit the current theory that pandemic strains of influenza result from new combinations of flu genes from animal and human viruses. "It is therefore most probable that the occurrence of New Jersey swine virus in humans in Fort Dix represents an isolated event without serious consequences," Palese writes in an article that will appear in CELL.

Separation of the eight genes of the influenza virus has made it possible for researchers to determine the genes that code for each protein in the virus and to begin clarifying the role each protein plays in infection. Two human viruses—PR8, which was prevalent before 1947, and HK, the current A-Hong Kong strain—have genes with different separation characteristics (see figure). The researchers detected the protein message of each gene by infecting a cell with different viruses and analyzing resultant viruses that included new combinations of genes. Palese and co-workers compared the proteins present in each new virus with the RNA segments and with any altered characteristics of the virus. They found, for example, that P1 and P3 proteins are necessary for synthesis of intermediate RNA strands, and P2 and nucleoprotein are probably necessary for synthesis of the RNA that goes into the final virus particles. They have also learned that not only surface proteins but also some internal pro-



Separation of genes from flu viruses

teins influence whether a virus can evade a host's immune system and infect cells.

"Clearly we are now in a position to ask which gene(s) is involved during different replication steps and to identify genes contributing to virulence in a particular host system," Palese writes in his paper. "RNA analysis of different influenza viruses and their recombinants will open new avenues of investigation into the capricious nature of influenza virus."

The new methods of analysis may also lead to a more rational approach to selection of vaccines. "It is extremely important that any virus given to man today be completely genotyped so we know the origin of every gene. Before this, we could only identify two genes," Palese says. □

Limited use of flu shots resumed

An outbreak of A-Victoria flu in a Miami nursing home and cases scattered across the United States and Canada has prompted the Department of Health, Education and Welfare to partially lift its ban on flu immunizations. Secretary Joseph A. Califano Jr. recommended doctors vaccinate elderly and high-risk persons with the combined vaccine that protects against both A-Victoria and swine flu viruses. Although an epidemic of swine flu remains unlikely, the combination shots will be given because no single-purpose vaccine against A-Victoria influenza was manufactured this year.

Doctors may also resume immunization against B-Hong Kong flu, a milder strain that commonly attacks children. Only the

ban against the single-purpose swine flu vaccine remains in effect. Califano acted after a panel of scientists and other specialists, asked by HEW to review the immunization policy, recommended that the moratorium be ended.

The massive swine flu immunization program was stopped abruptly two months ago when accumulating evidence indicated that risk of a rare paralysis (Guillain-Barre syndrome) was increased among people who had received either type of swine flu vaccine. Public health officials estimate that one in 120,000 vaccine recipients developed the syndrome, which appeared two to three weeks after vaccination. In announcing the policy change, Califano said he had to weigh the excess risk of death from Guillain-Barre syndrome, about one in a million, against the risk of death from influenza, which he said could kill approximately 1,260 persons in a million among elderly and chronically ill people.

Scientists do not agree on the nature of the relationship between the swine flu vaccine and Guillain-Barre disease. "There is a slightly enhanced risk over background, we agree on that," says E. D. Kilbourne of Mt. Sinai School of Medicine. Kilbourne believes it is not specifically the swine flu virus that causes the syndrome, but rather an abnormal immunological reaction in a tiny fraction of the population. "A multiplicity of infectious agents might stimulate the abnormal response," Kilbourne says. "It could be from immunization with anything." Among unvaccinated people, he explains, the syndrome often occurs soon after a viral illness, again suggesting an unusual response to infection.

Discussion among scientists at the Perspectives in Virology symposium in New York last week focused on whether stimulation of so rare a disease would have been detected among previous immunization programs. It has not shown up in polio immunization programs in the United States or in Europe. John P. Fox of the University of Washington points out, however, that Guillain-Barre disease is less frequent and milder among children, the targets of most polio vaccination programs. "Nowhere in our previous national experience have so many people received vaccines in so short a time," Fox says. Kilbourne also stresses the large amount of money and computer assistance applied for the first time to detection of side effects.

The virologists generally approved of the reinstatement of the flu shots for the high-risk groups. Saul Krugman of New York University summarized: "When you weigh risks and benefits carefully, there is an 80 percent effective capacity of preventing infection, against the small risk of Guillain-Barre syndrome, which we never would have known about without a deliberate, careful attempt to look at every possible side effect." □

Primate sex preference at ovulation

In lower mammals, mating occurs only at the time of ovulation. Not so in humans and other primates; copulation may occur at any time during the female's menstrual cycle. However, it now appears, according to research reported in the Feb. 3 NATURE, that both male and female primates are more interested in sex during the female's fertile period than at other times. Such a finding is hardly unexpected since it would encourage the survival of a species in which sex serves more than a purely reproductive function. The report also shows that the heightened sexual interest in both male and female primates at the time of ovulation depends on sex hormones secreted by the female.

Richard P. Michael and R.W. Bonsall of Emory University School of Medicine studied the sexual behavior of rhesus monkeys at various periods of the female rhesus monkeys' menstrual cycles. Since the male rhesus monkey is nearly twice the size of the female, it is difficult to obtain an independent measure of the female's sexual motivation uninfluenced by the threat of male aggression. So Michael and Bonsall used an operant conditioning technique in which females controlled access to males.

A female's testing cage was divided by a movable partition. If she pressed a lever on her side, the partition raised and she was able to pass to the other side of the cage, which contained a male partner. After she reached the male, a behavioral test was conducted during which observers scored various aspects of the pair's behavior from behind a one-way mirror.

Results were obtained from 1,440 behavioral tests of 17 pairs of male and female monkeys conducted during 63 menstrual cycles. They showed that the females were more anxious to gain access

to males right before or during ovulation than at any other time during their menstrual cycles—that the females were quicker to gain access to the males during this period than they otherwise would have. Male ejaculation was also greatest during this period of the menstrual cycle, the findings revealed.

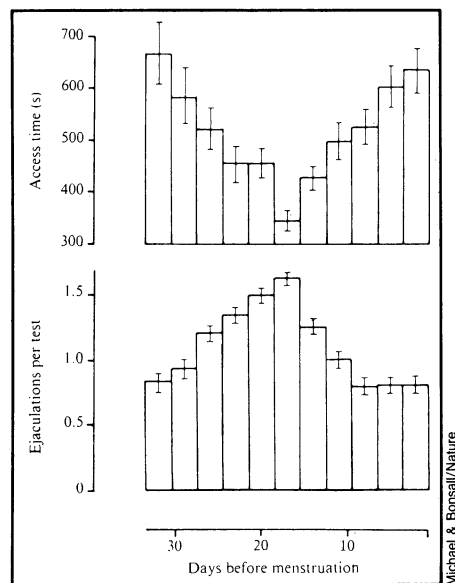
To obtain more precise information on the temporal relationship between these sexual behaviors and the females' sex hormone status, Michael and Bonsall collected blood samples from five females on five alternate days (daily near midcycle, the time of ovulation) during 33 menstrual cycles. They analyzed these samples for sex hormones. All these cycles appeared normal, with the characteristic preovulatory estrogen peak occurring 19 to 17 days before the next menstruation. Hormonal and behavioral data from the preovulatory periods of these 33 cycles were then combined by aligning them on the days of the estrogen peaks. The highest average ejaculation frequency and the fastest average access time both occurred together one day after the estrogen peak—right before or at ovulation. On that day all males always succeeded in ejaculating, and all females always pressed for access to their partners.

Still further proof that a female rhesus monkey's sex hormones strongly influence both her sexual behavior and that of her partner was obtained by Michael and his co-workers back in 1972. When sex hormones were injected into female rhesus monkeys whose ovaries had been removed, both the sexual behavior of the females and of their sexual partners changed.

Thus, female sex hormones appear to synchronize and maximize female rhesus monkeys' sexual motivation and male rhesus monkeys' ejaculatory performance. "The neuroendocrine mechanisms underlying the behavioral synchrony between the sexes and the timing of ovulation," Michael and Bonsall conclude, "clearly have a selective advantage by optimizing the chances for successful fertilization and, thus, for survival in this highly evolved primate species in which sexual behavior serves more than a purely reproductive function."

A crucial question not answered by this research, however, is how do sex hormones secreted at the time of ovulation by the female make the male more interested in sex than usual. Does the female's heightened enthrallment, due to the sex hormones she secretes, spur the male to greater enthusiasm about sex? Possibly. Yet chemical sex attractants are probably also responsible for the male's excessive zest for sex at the time of ovulation since female monkeys are known to secrete such attractants.

And then there is a still more pressing



Heightened sexual interest of male and female monkeys coincides with ovulation.

Michael & Bonsall/Nature