



fleas to man, the second is man's fleas to man's fleas, and once a certain threshold is reached, pulmonary aerosol transmission.

The danger of "casual transmission" exists for all diseases past a certain threshold.

The Sergents refined that notion, with their discussion of the different modes of infection in both sick and carriers.

Infection, they wrote, can be either passive or active.

Passive means the body is impregnated with germs.

Active means the act of impregnating with germs.

Either form of infection can be *without clinical signs*.

The active phase is what is today called viremia for viral infections.

In short: It is important, even crucial, to distinguish between the person who has antibodies to a viral infection because he has a few cells in which the virus hides, and that same person during periods of viremia when he or she will be producing millions of viral particles and hence be highly contagious.

It is also of note that today's children with HIV-induced immuno-deficiency can no longer be immunized against other diseases, and that those people who are developing immune deficiencies see the "passive" pathogen multiply and become active.

An unapparent disease can mean either *premunition* or *non-premunition*. Premunition means that as long as a person is infected with a small quantity of hematozoa (blood parasites), he or she is immune against catching a "superinfection" of malaria, but is infectious to others, even without suffering clinical symptoms.

However, once, and if, the body clears itself of all parasites, the person can catch the disease again.

Non-premunition is the case for AIDS today. In their groundbreaking studies of piroplasmosis, the Sergents adduced the following: "Experimental study of resistance to superinfections conferred by an initial infection has led us to be able to specify the notion of premunition, a form of resistance different from real immunity. An animal infected by a

piroplasm [a small parasite of the blood commonly carried by ticks], if it survives the acute crisis of invasion and comes to tolerate the virus, resists, as long as it remains a germ carrier, reinoculations of the same piroplasm (law of precedence). If it recovers from its primo-infection, it stops being protected against reinfections. One has drawn from this conception of premunition a practical conclusion: to give the cow a benign, chronic (if possible latent) infection, which will prevent it from getting a grave infection." (Virus is meant in its original sense of filtrable microbe.)

From that understanding of the successive modes of infection, the Sergents adduced the importance of *screening by blood test*, a screening as wide and comprehensive as possible, using the entire array of bacteriological and viral detection measures available to them at the time.

Systematic testing of the blood was made necessary, they said, because of the fact that the parasitical outbreak and the clinical outbreak might not coincide.

Together, clinical recovery and parasitical recovery mean separate immunity, mean *premunition*.

Correction

In our *Science & Technology* section in the June 10, 1988 issue, "Stopping the Epidemics: The French Military Legacy," due to an editorial error, we inadvertently placed an epidemic of Chagas' disease in the African nation of Chad. The Chadian epidemic is trypanosomiasis, familiarly known as "sleeping sickness," caused by a trypanosome carried by the tse-tse fly. Chagas' disease, also caused by a trypanosome, attacks the visceral organs and occurs only in Ibero-America.