

## The female edge against disease

When it comes to disease resistance, there is little doubt that women are the superior sex. For instance, more boys than girls die in the womb, at birth and shortly after birth. More men than women are susceptible to severe parainfluenza respiratory infections; staphylococcal, *H. influenzae* and *E. coli* infections; central nervous system infection with polio virus or ECHO virus; fatal infectious mononucleosis; rotavirus gastroenteritis; two slow virus diseases; Legionnaires' disease; and even cancer. Men's lower resistance to disease, along with certain occupational and lifestyle factors, probably explains why women outlive men, on the average, by eight years.

Why do women possess a superior resistance to disease? It may be because evolutionary selection has equipped them with a double dose of genes that code for the immune system, David T. Purtilo and John L. Sullivan of the University of Massachusetts Medical School in Worcester propose in the December *AMERICAN JOURNAL OF DISEASES OF CHILDREN*. They base their hypothesis on ample evidence published by various investigators.

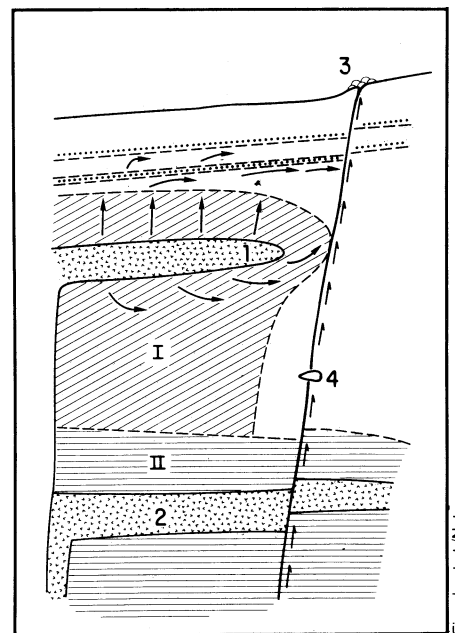
For instance, there is a wealth of data showing that resistance against disease depends on a strong immune system, and

some data that a number of human immune regulatory genes reside on the X sex chromosome. So, because women have two X chromosomes, and men only one, it is quite plausible that females possess a double dose of certain immune genes and hence a double dose of certain immune fighters in their bodies, such as T cells, B cells and antibodies. In fact, women have been found to form more antibodies against polioviruses and *E. coli* bacteria and to have more IgM and IgG antibodies than men do.

The reason that women have two X chromosomes and hence more immune genes than men have, Purtilo and Sullivan continue, is perhaps an evolutionary adaptive response to protect women from excessive immune suppression during pregnancy. Women's immune systems are known to be hampered somewhat during pregnancy, probably not enough to open women to disease but enough so that they will not reject the fetuses.

Women's superior immune responses, however, sometimes backfire on them, Purtilo and Sullivan point out. Unlike many other diseases, autoimmune diseases such as systemic lupus erythematosus, myasthenia gravis and rheumatoid arthritis strike women considerably more often than they strike men. What happens, it appears, is that female sex hormones somehow allow the female immune system to turn against the body rather than against some foreign enemy. □

## Ore formation the early ocean way



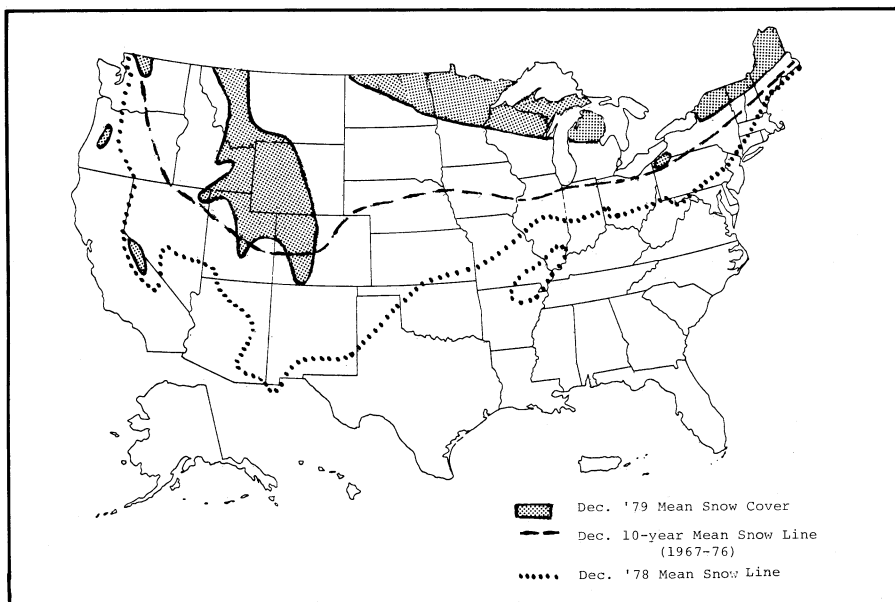
Magma (1 and 2) intrudes into sediments (I and II). Water leaves sediments, carrying minerals up cracks and deposits them on sea floor (3) where they are buried (4).

Where else to look for the origin of continental ore deposits but in the ocean? Fountains of hot water and minerals on the East Pacific Rise — one of many places where new ocean crust is forming — were researchers' first glimpse at the formation of ores by hydrothermal activity (SN: 1/12/80, p. 26). Warm water vents found 2,000 miles south on the Galapagos Rift proved to be their timid cousins: Instead of belching out minerals, they coyly drop their leached ores just below the sea floor surface. Now, evidence for another type of hydrothermal ore formation has been found in the sea floor.

Distinct from the processes discovered earlier because it does not involve the circulation of water through the crust, this latest variation on the ore formation theme may be typical of very young oceans that are just beginning to open, researchers say in the Jan. 31 *NATURE*. Such an ocean exists in the Gulf of California where evidence for the process was recovered in the form of deep sea cores. The Guaymas Basin in the Gulf is a young ocean — 3.5 million years old — that is forming as new sea floor is created along the East Pacific Rise. River runoff from land on both sides dumps huge amounts of sediment onto the newly formed volcanic crust. Scientists speculate that similarly thick sediments piled up on the newborn Atlantic sea floor until the broken continental edges moved farther away from the spreading center.

The thick sediments seem to be the key to the type of hydrothermal ore formation

## Snow no show



To illustrate what Olympic organizers in Lake Placid, N.Y., already knew, the National Environmental Satellite Service of the National Oceanic and Atmospheric Administration put together this map comparing December 1979 U.S. snow cover with that of previous years. The situation has since improved for Olympic schussboomers and New England ski resort owners, but the map shows that the December 1979 snow cover (shaded area) fell far short of the record-breaking cover for December 1978 (dotted line) and didn't even come close to the 10-year average (dashed line). It also shows that the winter predictions of heavy snows in the Midwest, Plains and Rockies haven't quite panned out (SN: 12/8/79, p. 388). The map was compiled from satellite imagery.