ply of chromosomes in each new organism, so that mutant genes that survive in one parent are often suppressed by dominant genes from the other. Asexual organisms, by contrast, perform a kind of incest.

That is why sex and all that goes with it makes sense to scientists, if not to others.

Chaos

"Chaos Theory: How Big an Advance?" by Robert Pool, in *Science* (July 7, 1989), 1333 H St. N.W., Washington, D.C. 20005.

Chaos has crept into science. A century after "chaos theory" was first hinted at by the French mathematician Henri Poincaré (1854–1912), scientists are debating whether it heralds a revolution even more fundamental than quantum mechanics and Einstein's theory of relativity, or whether it is merely a small step forward for science.

Chaos theory is hard to explain, notes Pool, a *Science* staff writer. It suggests that systems described by mathematical equations—the motion of heavenly bodies, for example—sometimes "act in such a complicated way you cannot predict exactly what they will do in the future. The best you can do is make probabilistic statements about them."

Like quantum mechanics, chaos theory has no single author. Many scientists have developed and applied it in different fields. MIT astronomer Jack Wisdom, for example, has shown that Pluto's orbit around the sun is chaotic. The research of Ary Goldberger, a Harvard cardiologist, suggests that healthy human hearts have chaotic fluctuations in their pattern of beating; ailing hearts have more regular beats.

Nearly 30 years ago, MIT's Edward Lorenz sparked the "chaos revolt" among scientists when he demonstrated the existence of chaotic behavior in atmospheric air flows. As a result, meteorologists accept the idea that weather forecasts more than a couple of weeks into the future are now impossible. But some insist that chaos theory will eventually help them overcome that limit.

Such arguments are the nub of the debate over chaos theory. Is it chiefly a new tool that will help penetrate the mysteries of the universe? Or does it show that some questions never will be answered, that we will have to drop our 200-year-old vision of a clock-like Newtonian universe? An answer may be decades away.

The Green Hour

"Absinthe" by Wilfred Niels Arnold, in *Scientific American* (June 1989), 415 Madison Ave., New York, N.Y. 10017.

Artists and writers in every age seem to discover a new chemical shortcut to the Muse—marijuana, LSD, cocaine, and, perennially, alcohol. In 19th-century France, the drug of choice was absinthe.

Absinthe owed its popularity to French soldiers who fought in the Algerian wars of the 1840s. While in North Africa, they began to add extracts of the wormwood herb (*Artemisia absinthium*) to their wine, believing that it warded off fevers. It didn't, although according to Arnold, a biochemist at the University of Kansas Medical Center, wormwood did have a few medical uses, such as the treatment of roundworms, detailed by the ancient Egyptians, Greeks, and others.

In France, the veterans' newly acquired taste for the bitter herb (one ounce diluted in 524 gallons of water can still be tasted) was satisfied by absinthe. The pale green liqueur "was said to evoke new views, different experiences and unique feelings." One of wormwood's ingredients is thujone, a chemical that can cause intoxication and hallucinations—as well as convulsions and permanent damage to the nervous system. (Thujone was later used in research into convulsive therapy for schizophrenics.) By the 1850s, the French