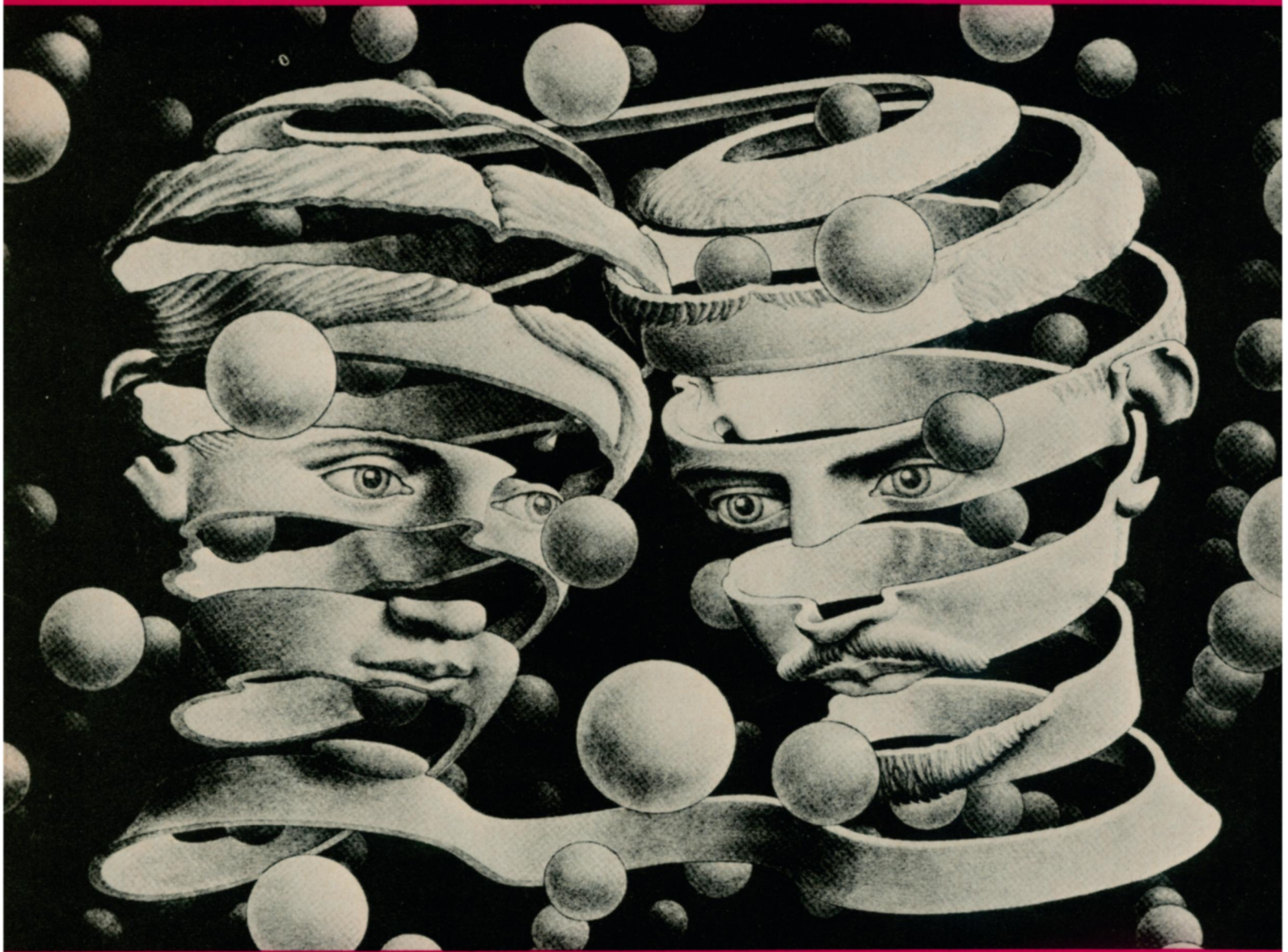


# science □ news

Nov. 10, 1973  
vol. 104, no. 19, 289-304

## Science in Wonderland



# ESP

# Conversation Pieces

Technically intriguing items  
from TRW, guaranteed to add luster to your  
conversation and amaze your friends.

**H**ow Many Days in a Year? A year is the time it takes for a planet to make one complete revolution around the Sun. Our own planet earth, for example, completes its orbit every 365.24199 days, a time which doesn't divide nicely into 52 seven-day weeks. Responding to this knotty situation, Julius Caesar devised a calendar in which he picked up an extra quarter day by having 365 days in the first three years and 366 in the fourth (leap year). While an improvement on the existing system, the Julian calendar was just over eleven minutes longer than the true solar year, so that every 128 years it gained a full day on the Sun.

Pope Gregory narrowed the discrepancy by ruling that years ending in 00 were not to be leap years unless they were divisible by 400. This saved three days every 400 years and put the Gregorian calendar (which we presently use) within 25 seconds of the true solar year.

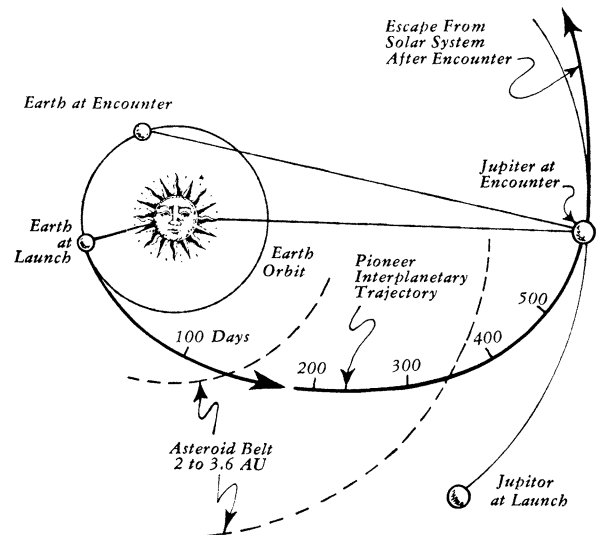
The year on the planet Jupiter is informatively different. Its great distance from the Sun (half a billion miles compared with the earth's 93,000,000) means that it takes Jupiter 11.86 earth years to complete one of its vast orbits. Unlike the earth (which rotates on its axis once every 24 hours), giant Jupiter rotates once every 9 hours and 51 minutes. Thus its day is less than half as long as ours. The combination of short days and long years on Jupiter means that there are more than 10,500 days in the Jovian year. Like everything else about Jupiter, its calendar is big and bulky. In fact, its immense size has caused one astronomer to remark that the solar system is made up of "the Sun, Jupiter, and some debris."

On December 3 of this year, a historic event involving the earth and Jupiter will take place. The Pioneer 10 spacecraft, built by TRW for the NASA-Ames Research Center, will fly past Jupiter. For 21 months, Pioneer has been streaking toward its target at speeds ranging from 30,000 to 80,000 miles per hour. Jupiter is so

far from earth that a signal sent to Pioneer at encounter will take 45 minutes to get there, even though it travels at the speed of light (186,000 miles per second):

Pioneer's onboard experiments, which have already provided space information enroute to Jupiter, are designed to yield useful data as far away as 20 astronomical units—about 2 billion miles.

Early next year when the Pioneer data has been examined and analyzed, we'll have some first-hand information for you on this giant of the solar system.



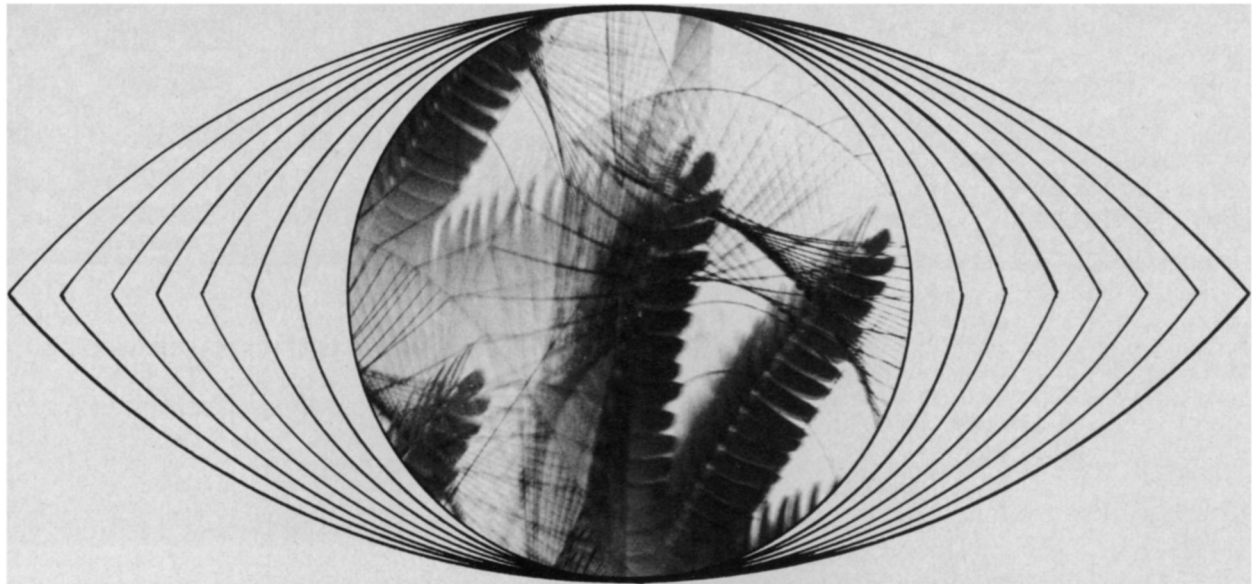
*Pioneer trajectory to Jupiter. This path uses the spacecraft's available energy most efficiently.*

For further information, write on your company letter-head to:

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