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SCIENCE WATCH

Burning Plants Adding to Nitrogen

SCIENTISTS have known for years that nitrogen, the gas that makes up 78 percent of the Earth's atmosphere, is pumped into the air by microbes that convert nitrates in the soil into nitrogen gas. Now scientists in Germany have suggested that there is another way the gas is released into the atmosphere: through the burning of trees, plants and grass by humans.

In an experiment at the Max Planck Institute of Chemistry in Mainz, West Germany, Jurgen M. Lobert and his colleagues measured the emission of nitrogen-containing gases from burning wood. They found that about 20 percent of the nitrogen in the wood was released into the air as gaseous forms of the nitrogen compounds ammonia, nitric oxide and nitrogen dioxide. They estimated that another 20 percent consisted of organic nitrogen compounds. (Estimates were required because the equipment used was not sensitive enough to measure the organic compounds precisely.)

The remaining 60 percent, they suggest, is emitted as molecular nitrogen, the major gas of the atmosphere. The study is reported in the current issue of the British journal *Nature*.

The finding is "a very important and fundamental discovery in our understanding of the biogeochemical cycling of nitrogen," said Joel Levine of the NASA Langley Research Center, who wrote a commentary in *Nature* on the findings.

Although nitrogen accounts for less than 1 percent of all the gases emitted by burning of trees, plants and grass

(carbon, oxygen and hydrogen compounds account for the rest), the nitrogen cycle is vital for plant and animal nutrition. In a process called nitrogen fixation, microorganisms associated with plant roots in the soil take molecular nitrogen out of the air and convert it to nutrients in the form of ammonium. The findings from Germany now suggest another way in which the atmospheric nitrogen is replenished, completing the cycle.

The burning of trees, plants and grass by humans has become widespread and is increasing, Dr. Levine said, and people are therefore becoming a more important factor in the recycling of life's basic nutrients.