

CLAIR CAMERON PATTERSON 1922 — 1995



Courtesy of the Division of Geological and Planetary Science, California Institute of Technology

A brief biography

By Lucas Psillakis, Environmental Impact Scientist

Despite never being awarded the Nobel Prize (there is, after all, no Nobel for Geology), Clair Cameron (Pat) Patterson accurately pinpointed the age of the earth at a time when most scientist's estimates for the age of our solar system were several times lower. He was also one of the most important environmental campaigners of his time.

By isolating minute quantities of lead from ordinary rocks and determining its isotopic composition, Patterson was able to use lead isotope ratios as an indicator for the age of geological samples, slowly building a model for the geochemical evolution of the Earth, before announcing a definite age for the planet of 4.55 billion years.

According to at least one source, Patterson's discovery so excited him that he drove to his home in Iowa and asked his mother to check him into a hospital because he thought he was having a heart attack. He later wrote:

*True scientific discovery renders the brain incapable at such moments of shouting vigorously to the world "Look at what I've done! Now I will reap the benefits of recognition and wealth." Instead such discovery instinctively forces the brain to thunder "We did it" in a voice no one else can hear, within its sacred, but lonely, chapel of scientific thought.*

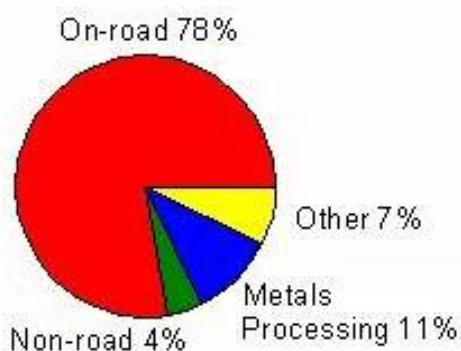
It was this historic work with lead that also led him to note that there had been a significant increase in atmospheric lead over a short period of very recent time (specifically ever since the introduction of tetraethyl lead (TEL) as an 'antiknock' compound in motor fuels, a seemingly useful enhancement

invented by a General Motors scientist, Thomas Midgley, who also later, regrettably, invented chlorofluorocarbons or CFCs, another chemical which once seemed a lifesaver). The company formed to promote leaded fuel, the Ethyl Corporation, is still going strong, and continues to market TEL through associates, although it no longer manufactures it.

Patterson calculated that the amount of anthropogenic lead dispersed into the environment each year was about eighty times the natural rate of deposit into ocean sediments. Thus, the geochemical cycle for lead appeared to be badly out of balance, although the car and petroleum industries insisted that atmospheric lead was safe.

### 1970 Lead Emissions Sources

221,000 tons



### 1997 Lead Emissions Sources

3,915 tons



In a 1965 paper Patterson made his first attempt to dispel the then prevailing view that industrial lead had increased environmental lead levels by no more than a factor of approximately two over natural levels and estimated that the lead concentration in the blood of many Americans was over 100 times the natural level, and close to a dangerously toxic level. In the 1960s, this was a somewhat controversial assertion to make. Today the impacts of even small amounts of lead on the nervous system are well known. No one can say for sure how humanity has already been affected and will continue to be affected for centuries to come.

After the advent of the Clean Air Act in 1970, in 1973 the US Environmental Protection Agency (EPA) finally announced a program to cut down on lead levels in gasoline.

Courtesy of US EPA

### Sources:

Clean Hands: Clair Patterson's Crusade against Environmental Lead Contamination; Cliff I. Davidson, 1998, Nova Science

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