

specialize in science, the lack of such educational and social experiences, while regrettable, may not be very serious. But to a less gifted youth, and especially to a youth for whom high school is the limit of his formal education, the poverty of curriculum of the small high school is probably serious.

Like Barker, I would like data on how students from small and large high schools turn out. But I suspect that adequate data will be very hard to come by, due to the great difficulty of controlling independent variables in educational research of this kind. (An example of one of the most serious difficulties is the factor of individual selection: the bright child may be selecting the small high school, the private school, and the small college.) At any rate, of all citizens, scientists should be circumspect in their judgments and pronouncements on the relative merits of different types of education and educational institutions.

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Ancient Tobacco Smokers

The persistence of alkaloids in plant tissue 1300 years old has been reported by Raffauf and Morris [*Science* **131**, 1047 (1960)]. They reported a test for alkaloids but did not identify the substance present in tobacco samples. These samples were obtained from Indian caves in northern Arizona.

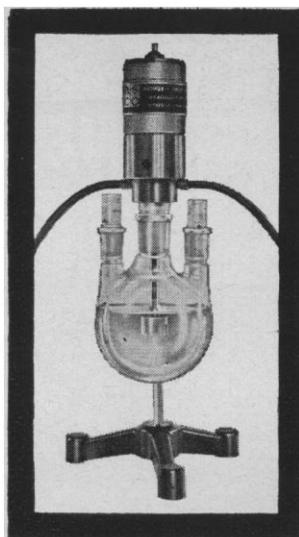
We have examined samples from the same archeological excavations (1). Microscopic and chemical investigations have shown that tobacco, presumably *Nicotiana attenuata*, was smoked by the Indians in pipes. Chromatographic and spectrophotometric analyses have established that nicotine was present in both loose tobacco and pipe dottel. The persistence of an alkaloid over such a period of time is remarkable, as Raffauf and Morris stated.

We believe our data are the oldest documented evidence for the smoking of tobacco (approximately A.D. 650) (2).

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References and Notes

1. The samples were kindly submitted by Dr. Morris.
2. V. Johnson, J. C. Holmes, F. L. Gager, Jr., "A study of the history of the use of tobacco," paper presented at the 13th Tobacco Chemists' Research Conference, Lexington, Ky., 30 Oct. 1959.



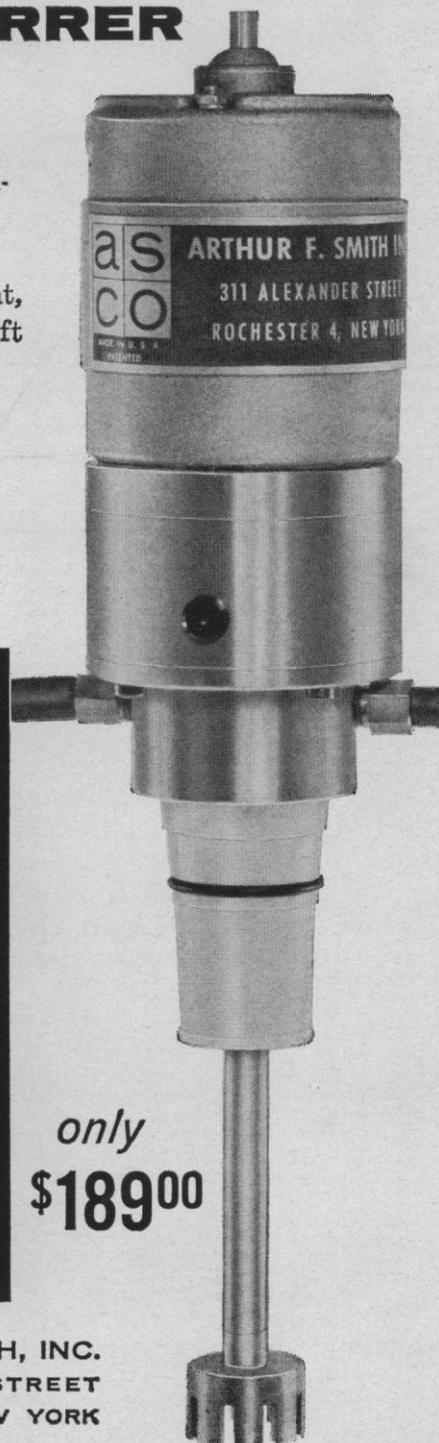
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