

Cannikin conclusions

The Cannikin underground nuclear explosion of Nov. 6 was one of the most thoroughly monitored seismic events of all time (SN: 11/6/71, p. 307). Analysis of some of the resulting data, released last week by the National Oceanic and Atmospheric Administration, confirms the initial judgments that the detonation produced few lasting effects on the area.

The explosion itself produced body waves of magnitude 6.8 and surface waves registering 5.7 on the Richter scale. Vertical ground motion amounted to 8 centimeters 22.5 miles from ground zero, diminishing to 0.04 of a centimeter at Anchorage, 1,350 miles away. Aftershocks, none registering more than magnitude 4, ceased when the explosion cavity collapsed 38 hours after the explosion. The earth's magnetic field, which averages about 50,000 gammas, increased temporarily by 9 gammas. There appeared to be no effects on local or global earthquake activity, the report said. Global and regional processes "are more important to earthquake activity here than such localized events as underground explosions."

A recent magnetic reversal

Reversals of the earth's magnetic field have provided strong evidence for continental drift and sea-floor spreading. They also give a worldwide chronological scale: rocks from different locations can be correlated in time by their polarity.

N.-A. Mörner of the University of Stockholm and J. P. Lanser and Jan Hospers of the University of Amsterdam report that a core taken from southern Sweden shows a previously undiscovered flip from reversed to normal (present-day) polarity occurred 12,400 years ago. Southern Scandinavia's glacial history is well-known, and the 13 stratigraphic units that could be identified in the core correlated well with dated climatic events. The core extends in time from about 12,600 to 8,600 years ago. The lowest part of the core is all reversed magnetically, so the beginning of the reversed event is unclear. The researchers suggest in the Dec. 27 NATURE PHYSICAL SCIENCE that the reversal may correspond to one found, but not dated, in France.

Where ocean and continent meet

At continental margins where the edge of the continent is also the edge of a crustal plate, release of strain energy caused by differential movement of the two plates takes the form of earthquakes. This is the situation along the Pacific coast of North and South America. A different kind of tectonic activity occurs at continental margins where a continent and ocean basin are part of the same plate, as along the Atlantic coast. This activity involves subsidence of the continental shelf.

In the Jan. 10 NATURE PHYSICAL SCIENCE M. H. P. Bott and D. S. Dean of the University of Durham, England, show that this tectonic activity is caused primarily by differential gravitational loading across the boundary between continent and ocean. This difference is due to different thicknesses of oceanic and continental crust and the presence of the ocean on one side. In a density model of the margin, they calculated the stresses at work and their effects. Their computations also explain the prevalence of normal faulting on the Atlantic continental shelf.

Smoking and small babies

At least 33 studies have reported that women who smoke give birth to smaller babies than women who do not smoke. This is dangerous because low-birth-weight babies (five and a half pounds or less) are more likely to die within one month than are heavier babies. Jacob Yerushalmy of the University of California in Berkeley disagrees with the obvious conclusion that smoking is dangerous because it causes smaller babies. He believes that behavioral and biological factors, rather than cigarettes, are responsible for the high incidence of low-birth-weight babies among smokers.

Yerushalmy studied 5,000 mothers and found that the smokers who gave birth to small babies had other things in common. They were extreme and carefree in their mode of life. They began menstruating early in life and were more nervous and neurotic than the nonsmokers who were relaxed and moderate. He found that the incidence of low-birth-weight infants was high even before the mother began smoking. Also, the small infants of the smokers were more healthy than the small infants of nonsmokers. These findings are tentative, he says, until confirmed by other investigations. But he concludes in the Jan. 15 AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY, "smokers represent a group of people whose reproductive experience would have duplicated the observed patterns whether they smoked or not."

Police role identity

Young police recruits enter their career at a time of life when their personalities are in flux and they are undergoing the normal psychological process of identity formation. Unfortunately, the formation of a truly professional identity is hindered by conflicts inherent in the police role itself. This conclusion, made by the Psychiatric Institute Foundation in Washington, is part of an interim report on the police department of Miami, Fla.

The recruit's major conflict is between his role as community servant and crime fighter. PIF therefore recommends that police departments be divided. One arm should be specifically recruited and trained for community service missions (routine preventative patrol, traffic investigation, and paramedical work). The other arm should have crime fighting as its primary mission.

Crisis in archaeology

Archaeologists are complaining about the destruction of valuable sites. Rapid construction of homes, highways and reservoirs is only part of the problem. Innocent collectors, looters and an expanding market in illegal art objects also contribute to the obliteration of sites of ancient civilizations.

Hester A. Davis of the Arkansas Archaeological Survey says in the Jan. 21 SCIENCE existing state and Federal laws must be strongly enforced and private business must be made aware of the value of these sites (SN: 11/12/71, p. 396). Clemency Coggins, in the same issue of SCIENCE, says museums, collectors and scholars must stop shopping in the illegal antiquities market that is financing the destruction of archaeological sites. If solutions are not found soon, says Davis, "we will have committed ourselves, irretrievably and irreversibly, to the future without benefit or knowledge of the mistakes and lessons of the past."