

Kidnapping's psychic residue

In the summer of 1976, three kidnapers commandeered a school bus in Chowchilla, Calif., holding the driver and 26 children at gunpoint. For the next 11 hours, they drove their captives around in darkened vans, after which they buried them alive for 16 hours in a trailer. Two of the children managed to dig their way out, and in the end all of the kidnapped children escaped unharmed. The kidnapers never explained their motives.

The misfortune of the Chowchilla school children provided Lenore C. Terr, a University of California at San Francisco psychiatrist, with a rare opportunity to study the long-range effects of severe psychological trauma on children. Although such effects (known officially as post-traumatic stress disorder) have been well studied in adults—primarily Vietnam veterans—little has been known about how (or how well) children deal with an experience of pure horror. As Terr reports in the December *AMERICAN JOURNAL OF PSYCHIATRY*, children are not nearly as resilient as one would hope. Four to five years after the incident, every one of the children studied suffered psychologically—but in ways that are distinct from the post-traumatic effects seen in adults.

Terr originally studied 23 of the victims during the year after the kidnapping, then reexamined those children and two others during 1980. Despite the fact that most of the children received therapy at the time of the first interview, many of the symptoms persisted, and new symptoms appeared, over four years. One symptom that appeared only at the four-year follow-up, Terr reports, was painful embarrassment. The children were not the least bit boastful about having escaped; to the contrary, being publicly recognized as a kidnap victim caused them profound shame about their vulnerability and loss of autonomy.

Many of the children experienced persistent fears—of an imagined fourth kidnapper, the kidnapers' relatives, another kidnapping. And most of the children experienced more generalized fears—of strangers, vehicles, the dark. Interestingly, unlike adult trauma victims, the children experienced no amnesia about the event. They recalled the kidnapping in full detail. Also unlike adult victims, the children did not experience uncontrollable flashbacks, which are commonly accompanied by sweating and heart palpitations; When asked about the kidnapping, Terr says, they appeared to daydream, to stare off into space as if they were viewing the event on a screen, but the memory was not intrusive. This difference, Terr suggests, might help explain another striking difference between children and adult victims: Where adults commonly suffer a serious decline in work performance, only a few of the children had academic problems in the wake of the kidnapping.

The children also showed a significant disruption in their sense of time, Terr reports. Their recollections were skewed, so that events that actually occurred after the kidnapping were remembered as having occurred prior; in this way, Terr says, they were able to view unrelated events as predictive. In addition, many of the children construed meaningless occurrences from before the kidnapping as omens that they should have recognized. The children's personalities have been profoundly affected by their need for a sign that might have allowed them to avoid the kidnapping, Terr says; what they have done is choose responsibility—even guilt—over the reality of helplessness.

All of these symptoms coningle in the children's personalities, Terr says, resulting in what she calls "severe philosophical pessimism." With few exceptions, the children anticipate a short life or a future disaster; they are incapable of envisioning marriage, children or career. They boast that such things as nuclear disasters and natural calamities do not worry them, but in actuality, Terr concludes, they are not toughened. Instead, she says, "they have narrowed their spheres of concern to their own rooms at night, to the local disasters in their home towns, and to other kidnap victims around the world."

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Home-grown octopuses

The octopus is important as a subject of research in European biological laboratories, but it has been little studied by scientists in the United States. There are no large, accessible octopus populations along the U.S. coasts. Now Roger T. Hanlon of the Marine Biomedical Institute of the University of Texas Medical Branch at Galveston reports success at rearing large numbers of octopuses from fertilized eggs in tanks of recycling seawater.



Partially developed *Octopus briareus* embryos growing in a large rearing tank.

The greatest success has been with the species *Octopus bimaculoides*, Hanlon says. More than 50 mature adults of this species have been raised from eggs collected off the coast of Southern California. This species of octopus is used in experiments testing visual discrimination, sexual maturation and effects of toxic substances on behavior. Two other species, *O. joubini* and *O. maya*, are also being bred in large-scale cultures. A fourth species, *O. briareus*, is only suitable for breeding on a small scale, Hanlon finds. *O. briareus* is aggressive and cannibalistic, so each animal must be raised individually from hatching to maturity.

Octopuses are especially advantageous for laboratory research because their natural curiosity allows them to be easily trained for learning and discrimination tests and because they recover rapidly, within two days, from brain surgery. They are also valuable for study of the peripheral nervous system. Special nerve cells that trigger color changes in the skin provide "a two-dimensional map of the nervous system," Hanlon says.

Birth of test-tube monkey research

The first "test-tube" rhesus monkey is doing fine at the age of 4 months. He lives in a large pen with a group including his foster mother and other young monkeys, says a spokesman for the Wisconsin Regional Primate Research Center in Madison. The monkey had been delivered by Caesarean section and then rejected by his surrogate mother, who had been implanted with a laboratory-fertilized egg from his biological mother.

Work on in vitro fertilization for monkeys lags far behind that for humans. While it has been five years since the birth of the first human "test-tube" baby, there have been only two non-human primate births from the technique, in which sperm and egg are brought together in a laboratory vessel rather than in the female reproductive tract. Besides the rhesus monkey, a "test-tube" baboon was born at the Southwest Research Institute in San Antonio, Texas, last summer.

These primates will be closely observed for developmental problems and their offspring will be monitored for any abnormalities that might be associated with laboratory conception. Barry Bavister of the Primate Research Center suggests that research on monkeys may provide early clues to possible problems in "test-tube" humans and their children.

What's at the Smithsonian museums?

The Smithsonian Institution recently completed a five-year-long inventory of the collection in nine of its twelve museums. The Museum of Natural History counted 7 million beetles; 4 million butterflies and moths; 340,000 pressed ferns and flowering plants; 114,429 bird eggs; 25,356 fossil fish, including shark teeth; 21,683 snails and other mollusks; 6,282 marine sponges; 6,012 fur pelts, and 14 elephant skulls.

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