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tached from the real world. Viewers are not supposed to be reminded of (or to reflect on) shared experiences, they are meant to contemplate the unique qualities of the works themselves.

A case in point is the 1970 monument in Dallas commemorating President John F. Kennedy's assassination. Hubbard describes it as a "large hollow cube lifted off the ground and open to the sky, with a vertical slit cut out of the center of two opposite sides." The monument does not seem to focus attention on the tragedy of 21 years ago, he protests, but on "the feeling of enclosed space and the play of light on hard surfaces."

Hubbard does not contend that the Vietnam Memorial should have exalted the war itself. Such a monument, he says, "would have been a sham." Rather, the memorial should have led viewers to ask such questions as: "Is the defense of this land the only justification we will accept for sending young men and women to death in faraway places?"

Art, Hubbard asserts, must help people think about *human* experience. The alternative is "to leave the field in the sole possession of words," which do not always alone suffice. A monument that spoke in the symbolic language of the imagination, he believes, might have helped Americans get closer to agreeing on the meaning of Vietnam.

The Secret of Stradivarius

"The Stradivarius Formula" by Joseph Alper, in *Science* 84 (Mar. 1984), P.O. Box 10790, Des Moines, Iowa 50340.

For nearly 200 years, no one has been able to duplicate the sound of the stringed musical instruments made during the Renaissance by Antonio Stradivari and by later Italian masters. But the work of a chemist in Texas could change all that, says Alper, a freelance writer.

From the mid-1500s to the late 1700s, a colony of uniquely skilled musical craftsmen flourished in the northern Italian town of Cremona. The violins of Stradivari, Nicolo Amati, and Giuseppi Guarneri were hailed throughout Europe for their rich sound. Today, these Cremonese instruments remain highly prized by musicians: One of the 700 extant Stradivari sold recently for \$1.2 million.

Succeeding generations of violin makers have examined the wood, the construction, and the acoustics of Cremonese instruments, but the secrets have eluded them. Now Joseph Nagyvary, a biochemist at Texas A & M University, thinks that he has unlocked the mystery.

He believes that modern craftsmen are the victims of a cruel trick played by Joannes Baptista Guadagnini, one of the last Cremonese masters. The secretive Guadagnini told his patron, Count Cozio di Salabue, that violins must be made from wood untreated by any chemicals. Eager to pass the secret on to posterity, the Count included it in a treatise on the violin. Ever since, craftsmen have used untreated wood.

But after extensive research, Nagyvary is convinced that the great Cremonese instruments were made from wood treated with a variety of mineral solutions that altered the wood's cellular structure and affected the instruments' sound quality. Nagyvary's investigation also re-

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vealed that the Cremonese masters used a unique type of varnish. After duplicating the varnish, he stripped and refinished several modern instruments whose sound, he maintains, has been improved.

Is a Nagyvarius as good as a Stradivarius? It's too early to tell, says Alper. Violins take up to 40 years to attain their best tone quality. Although some enthusiasts think that Nagyvary's violins already rank among the greats, most musicians feel that his instruments will have to undergo long scrutiny "from those who make their living playing them."

The Grande Dame Of Modern Dance

"Martha Graham" by Anna Kisselgoff, in *The New York Times Magazine* (Feb. 19, 1984), 229 West 43rd St., New York, N.Y. 10036.

Martha Graham, at age 90 "the most famous dancer and choreographer in the world," is still going strong. Though Graham herself stopped performing in 1969, she continues to choreograph startling new works for the New York dance company that bears her name.

Graham virtually created American modern dance in the late 1920s. Along with Picasso and Joyce, declares Kisselgoff, chief dance critic for the *New York Times*, she has been one of the supreme innovators of 20th-century art. Rebellious against the strict formality of classical ballet, Graham pioneered a style that was raw and powerful, "more jagged



Martha Graham as she appeared in a 1940 performance of Letter to the World.