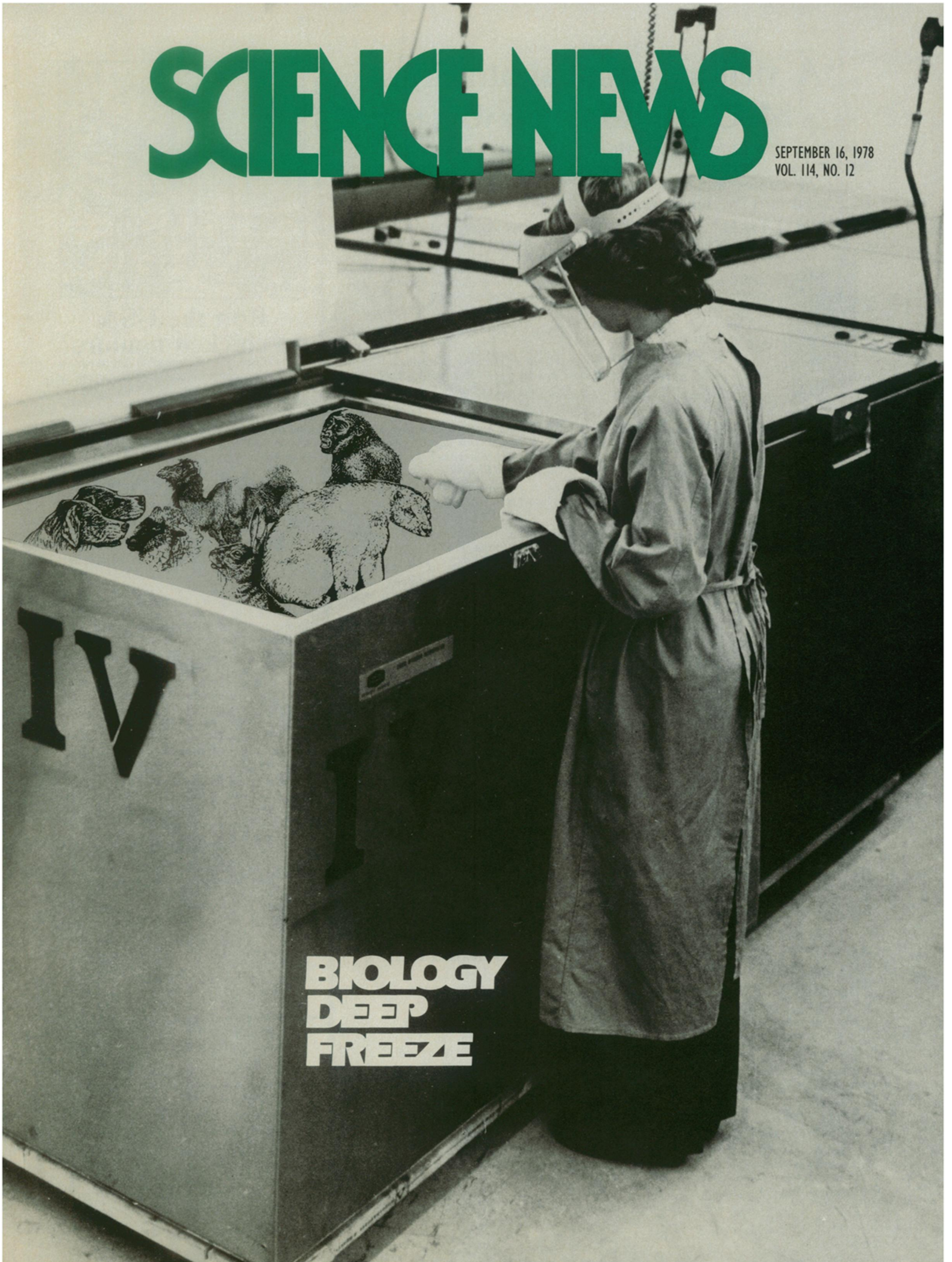


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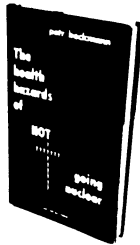
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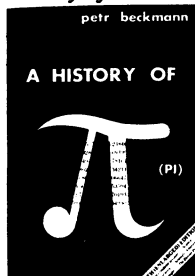
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Raymond J. Shamberger, Ph.D.:

ON YOUR RISK OF STOMACH CANCER FROM UNTREATED BEEF . . .

and how the natural antioxidants, vitamins
C and E and selenium, help protect you!

PUBLISHER'S NOTE: *Dr. Raymond J. Shamberger is a member of the Division of Laboratory Medicine, Department of Biochemistry, the Cleveland Clinic Foundation. He has published some 80 scientific papers and abstracts in the area of nutrition and cancer.*

—Richard Stanton

Studies indicate that Vitamin C, Vitamin E and selenium prevent experimental cancer in animals. Where these antioxidants occur in the environment human cancer mortality is decreased. A lack of these antioxidants in food (especially beef) causes a breakdown of unsaturated fat to form a carcinogen, *malonaldehyde*.*

Researchers have known for years that some malonaldehyde is present in beef and other meat, and even in vegetable oils and other foods under certain conditions.

*Malonaldehyde is formed as a result of uncontrolled oxidations leading to harmful changes of unsaturated fat. Unsaturated fat occurs widely in many types of food. Natural antioxidants in food protect against breakdown of the unsaturated fat to malonaldehyde. Malonaldehyde, which is similar in structure to glycidaldehyde and betapropiolactone, both of which are recognized carcinogens, is also mutagenic. Dr. Frank H. Mukai has shown malonaldehyde to be mutagenic in Ames' Salmonella testing system. Ames test system has greatly facilitated testing for carcinogens, since over 90% of the mutagens have carcinogenic activity.

In fact, malonaldehyde measurement has been used for years to determine whether or not foods are stale or rancid. There have been twenty-five reports that malonaldehyde was present in stale or rancid food. No one suspected that malonaldehyde was carcinogenic or mutagenic . . . because no one eats rancid food. A certain fundamental question comes to mind. Does malonaldehyde form gradually until rancidity starts or does malonaldehyde form only at the end of the rancidity process? In laboratory animals sacrificed for an experimental study, *malonaldehyde forms several hours after death of the animal*. The small amounts of malonaldehyde formed suggest to animal researchers that the malonaldehyde formed is an artifact of the breakdown process that occurs after death in tissues. If this is true that some malonaldehyde forms after

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