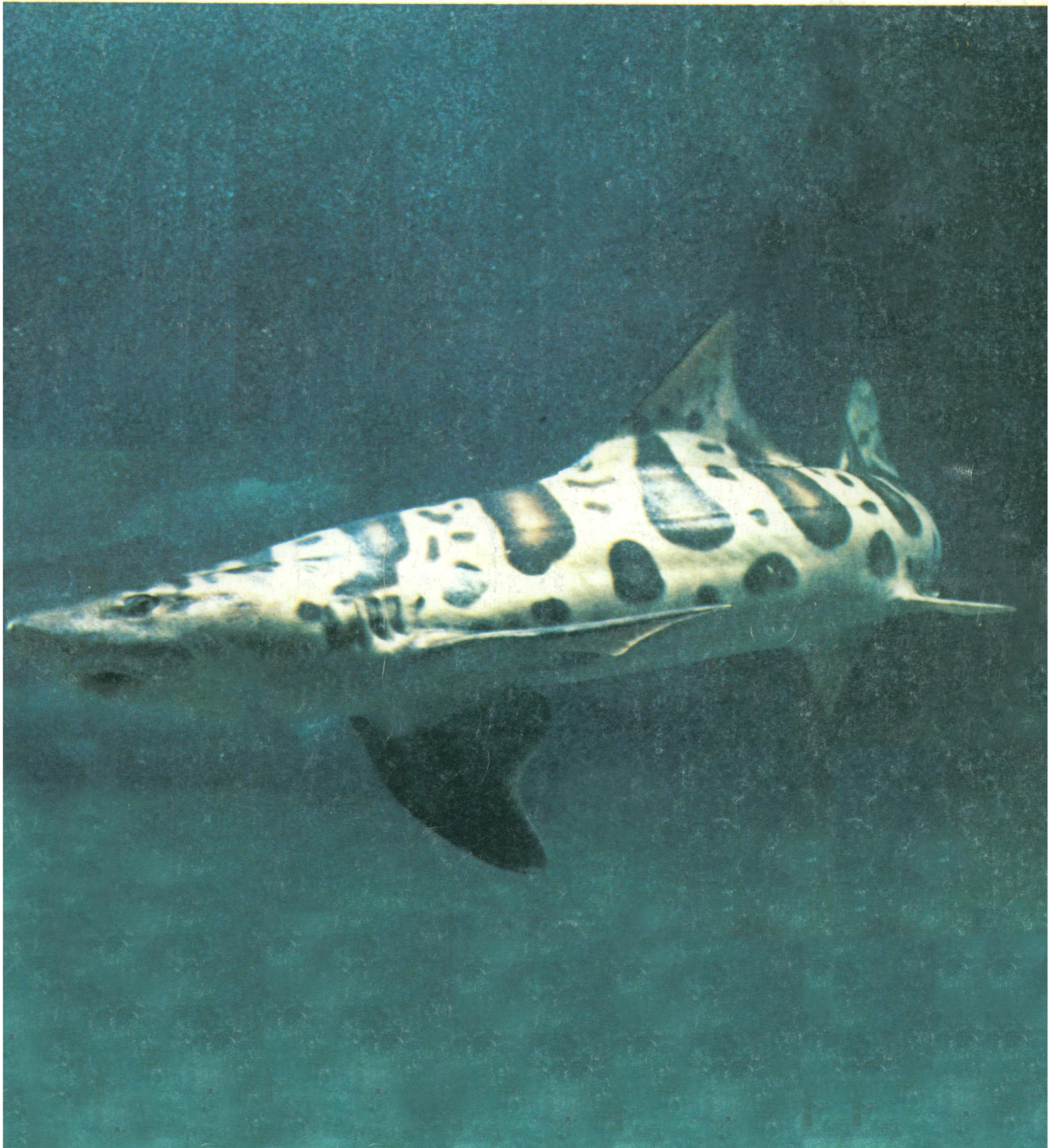


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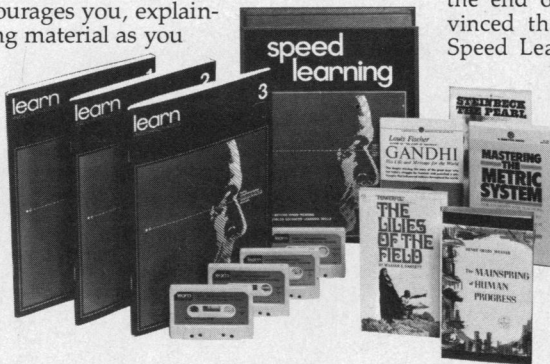
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LETTERS	Recombinant DNA Rules: <i>B. Talbot</i> ; Pollution, Plants, and Fertilizer: <i>N. R. Glass</i> ; Fusion: Funding Alternatives: <i>H. L. Berk</i> and <i>B. McNamara</i>	9
EDITORIAL	Cancer: Opportunism and Opportunity	11
ARTICLES	Superacids: <i>G. A. Olah, G. K. Surya Prakash, J. Sommer</i>	13
	The Rise of the Angiosperms: A Genecological Factor: <i>D. L. Mulcahy</i>	20
	High-Grade Fuels from Biomass Farming: Potentials and Constraints: <i>P. B. Weisz</i> and <i>J. F. Marshall</i>	24
NEWS AND COMMENT	NRC Shuts Down Submarine Fuel Plant	30
	China's Leaders Explain Views on Science.	31
	Relaxation Seen in Nonproliferation Policy	32
	A Kind Word for OPEC	33
	<i>Briefing</i> : Eli Lilly Agrees Not to Monopolize Insulin Market; Worse News About PCB's; Postscripts	34
	Hughes Institute Reborn Amid Strife	36
RESEARCH NEWS	Rings Around the Solar System	38
	Lowering the Cost of Alcohol	41
ANNUAL MEETING	Tours: AAAS Science Film Festival; Registration and Housing Forms.	43
AAAS NEWS	<i>Science 80</i> to Have Big Launch; Malcolm to Head OOS; Long Beach to Be Site for Solar Seminar: AAAS and NAS Issue Joint Appeal to Argentine Government; Reviewers Sought	48
BOOK REVIEWS	Sex-Related Differences in Cognitive Functioning, reviewed by <i>L. J. Harris</i> ; Electricity before Nationalisation, <i>J. E. Brittain</i> ; Infrared Astronomy, <i>F. C.</i> <i>Gillett</i> ; Mazon Creek Fossils, <i>W. C. Sweet</i>	50

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REPORTS	The Dead Sea: Deepening of the Mixolimnion Signifies the Overture to Overturn of the Water Column: <i>I. Steinhorn et al.</i>	55
	Catalytic Production of High-Grade Fuel (Gasoline) from Biomass Compounds by Shape-Selective Catalysis: <i>P. B. Weisz, W. O. Haag, P. G. Rodewald</i>	57
	Atmospheric Carbon Tetrafluoride: A Nearly Inert Gas: <i>R. J. Cicerone</i>	59
	Deciphering the Scattering Code Contained in the Resonance Echoes from Fluid-Filled Cavities in Solids: <i>G. C. Gaunaurd and H. M. Überall</i>	61
	Metabolism of Americium-241 in Man: An Unusual Case of Internal Contamination of a Child and His Father: <i>N. Cohen, T. L. Sasso, M. E. Wrenn</i>	64
	Neonatal Rat Surgery: Avoiding Maternal Cannibalism: <i>R. M. Libbin and P. Person</i>	66
	Heterogeneity of Vertebrate Luteinizing Hormone-Releasing Hormone: <i>J. A. King and R. P. Millar</i>	67
	Cerebral Norepinephrine: Influence on Cortical Oxidative Metabolism in situ: <i>S. I. Harik et al.</i>	69
	Tyrosine Hydroxylase Immunoreactivity in Familial Dysautonomia: <i>J. Pearson, L. Brandeis, M. Goldstein</i>	71
	4S RNA Is Present in Regenerating Optic Axons of Goldfish: <i>N. A. Ingolia</i>	73
	Shark Heart Mitochondria: Effects of External Osmolality on Respiration: <i>N. Lewiston et al.</i>	75
	Inhibition of Histaminase Release from Human Granulocytes by Products of Histaminase Activity: <i>J. J. Herman, J. K. Brenner, H. R. Colten</i>	77
	Heavy Metals Affect Rod, But Not Cone, Photoreceptors: <i>D. A. Fox and A. J. Sillman</i>	78
	Dopamine Auto- and Postsynaptic Receptors: Electrophysiological Evidence for Differential Sensitivity of Dopamine Agonists: <i>L. R. Skirboll, A. A. Grace, B. S. Bunney</i>	80
	Male Contribution to Egg Production in Butterflies: Evidence for Transfer of Nutrients at Mating: <i>C. L. Boggs and L. E. Gilbert</i>	83
	Serotonin Neurons Project to Small Blood Vessels in the Brain: <i>J. F. Reinhard, Jr., et al.</i>	85
	Correct Axonal Regeneration After Target Cell Removal in the Central Nervous System of the Leech: <i>K. J. Muller and S. A. Scott</i>	87
	Effect of β -Endorphin on Calcium Uptake in the Brain: <i>F. Guerrero-Munoz et al.</i>	89
	Long-Term Analgesic Effects of Inescapable Shock and Learned Helplessness: <i>R. L. Jackson, S. F. Maier, D. J. Coon</i>	91
	Learning in Normal and Mutant <i>Drosophila</i> Larvae: <i>E. O. Aceves-Piña and W. G. Quinn</i>	93
	Technical Comments: Prednisone Therapy and Birth Weight: <i>K. D. Smith, E. Steinberger, L. J. Rodriguez-Rigau; W. McK. Jefferies; J. M. Reinisch et al.</i>	96

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COVER

Leopard shark, *Triakis semifasciata*, shows the spots and grace of its feline namesake. This vigorous shark ranges along the western U.S. coast and serves as a frequent subject for elasmobranch research. See page 75. [Larry Ford, Scripps Aquarium, La Jolla, California]

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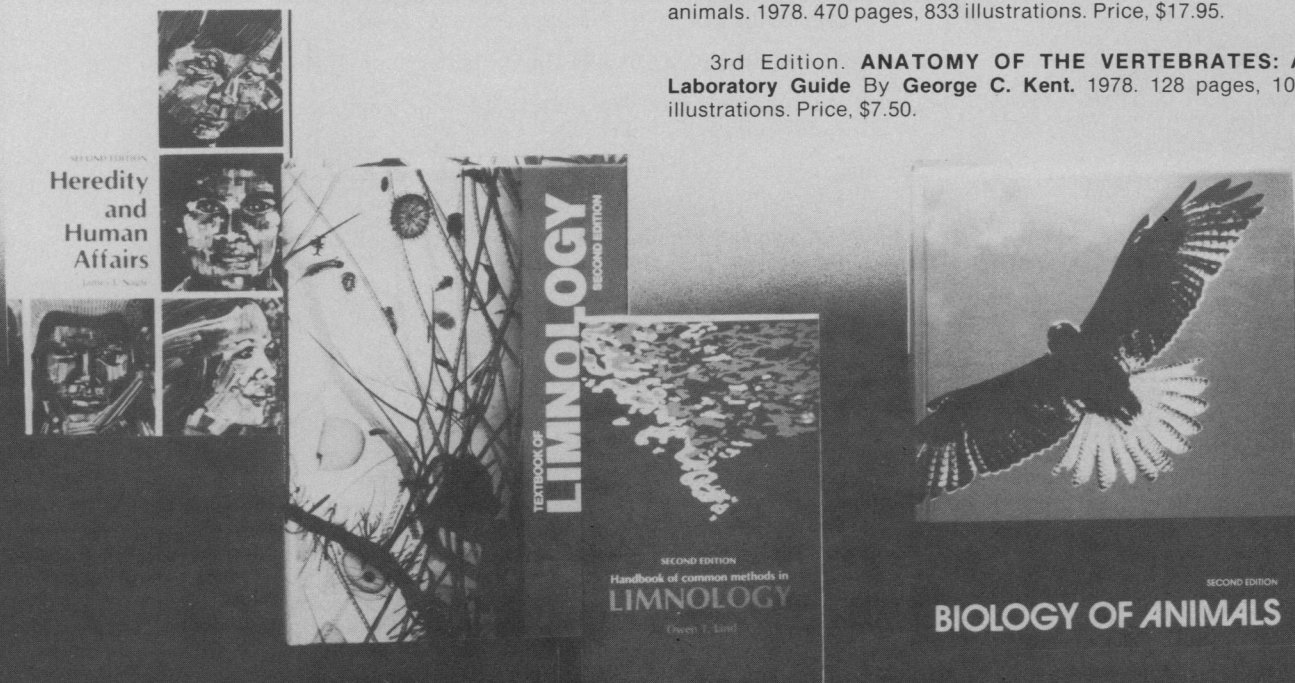
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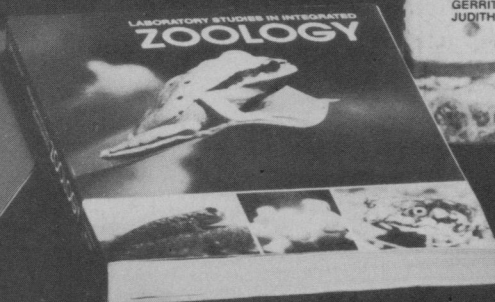
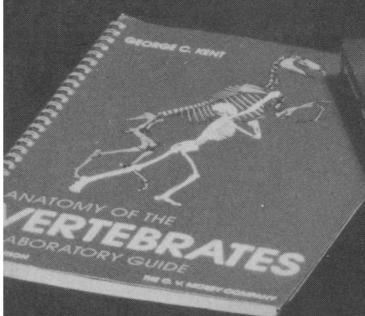
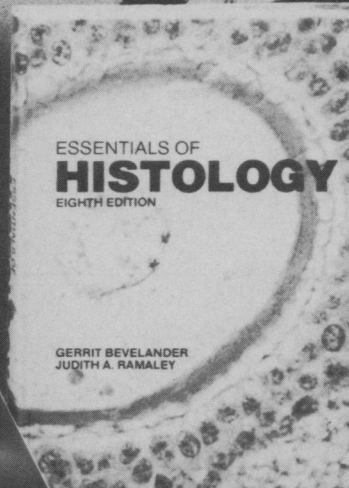
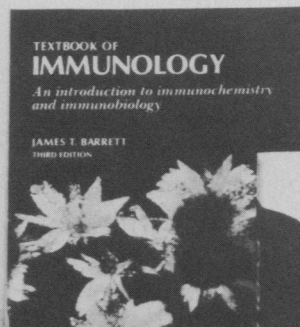
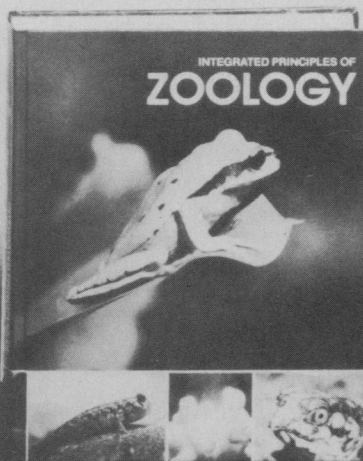
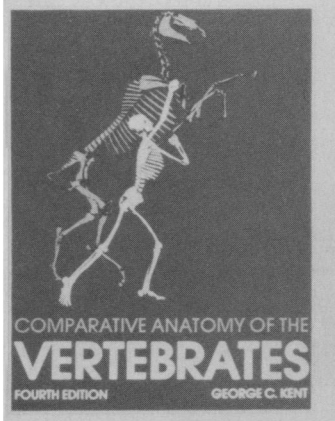
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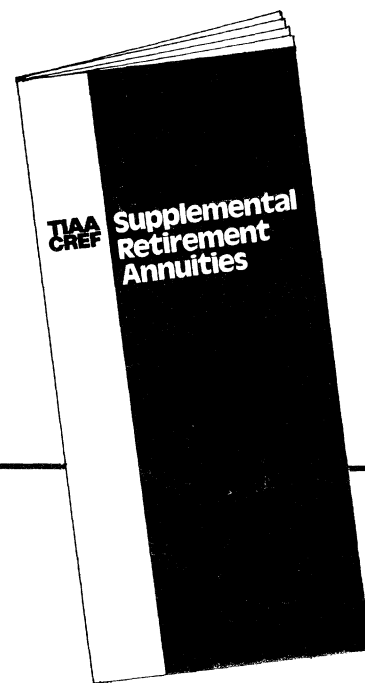


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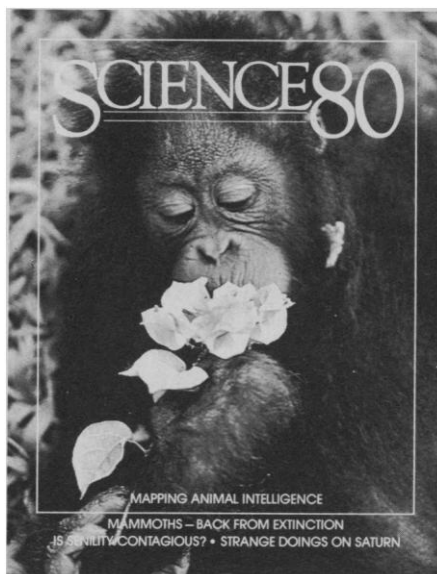
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Cancer—Opportunism and Opportunity

When people are unable to evaluate the magnitude of risks in a situation, many are inclined to fear the worst. This has been especially true in attitudes toward the health hazards associated with chemicals. A tendency for some people to be "spooked" has been exploited by opportunists who have talked of a cancer epidemic allegedly created by chemicals. Some chemicals in the workplace are carcinogenic, but their contribution to cancer prevalence is small in comparison to that of smoking and probably to that of natural substances in raw and cooked foods.

Talk of a cancer epidemic seems to owe much to misinterpretation of a statement made by John Higginson of the International Agency for Research on Cancer. He has written, "between 80 and 90 percent of all cancers are dependent directly or indirectly on environmental factors." However, Higginson recently emphasized that the principal basis for his estimate was such factors as lung cancer from smoking and carcinogens such as aflatoxins in foods. He estimated that 1 to 5 percent of cancers are due to the occupational environment.

The cancer stampede has created opportunities for people in politics and others yearning for publicity; it has also been tempting to some scientists in government. A group from the National Cancer Institute, the National Institute of Environmental Health Sciences, and the National Institute for Occupational Safety and Health gave then HEW Secretary Califano alarmist estimates which he used in a speech on 15 September 1978. The speech, which was widely quoted, included the statement that during the next 30 to 35 years, 17 percent of all cancer deaths will be associated with previous exposure to asbestos. The backup report for the estimate (not in a peer review journal) was flimsy. For example, an important component of the cohort cited as being at future risk was people who had worked in shipyards during World War II. The authors provided no data about the age distribution of the workers. However, because of the military draft, the average age of working males was probably 40 to 45. By now, these people must already have made most of their contribution to cancer statistics. The report was attacked by many epidemiologists. Richard Doll, Regius Professor of Medicine at Oxford, wrote, "I regard it as scientific nonsense." An editorial in the British medical journal *Lancet* criticized the report, concluding with, "it is sad to see such a fragile report under such distinguished names."

The effort to prove a big role for industrial chemicals diverts attention from what is probably the best hope for reducing cancer incidence—careful study of foods and effects of cooking. It has long been known that the incidence of gastrointestinal cancers is highly variable, both temporally and geographically. For example, a variation of the incidence of esophageal cancer by a factor of 100 has been observed in China, and there is a strong correlation between prevalence and food. Yet expenditures to examine the role of food in cancer has been comparatively small here. Leadership has been seized by Takashi Sugimura, director of the National Cancer Center in Tokyo. He has used the Ames test and other related procedures to detect mutagens and carcinogens in raw foods. He has also conducted experiments on the effects of elevated temperatures on proteins and amino acids and has observed the resulting formation of strong mutagens and carcinogens. He has pointed to differences in food preparation as the reason why incidence of stomach cancer in Japan is twice that here. Sugimura and colleagues have also studied mutagenic effects of flavonoids, including the highly mutagenic quercetin and kaempferol, which are present in many edible plants, vegetables, and fruits.

All people ingest the mutagens and carcinogens of food daily. Far fewer are exposed to hazards in the workplace. It is now feasible to monitor the mutagens naturally present in food and to evaluate changes arising from cooking. A comprehensive investigation of foods and the products of cooking should have high priority.—PHILIP H. ABELSON

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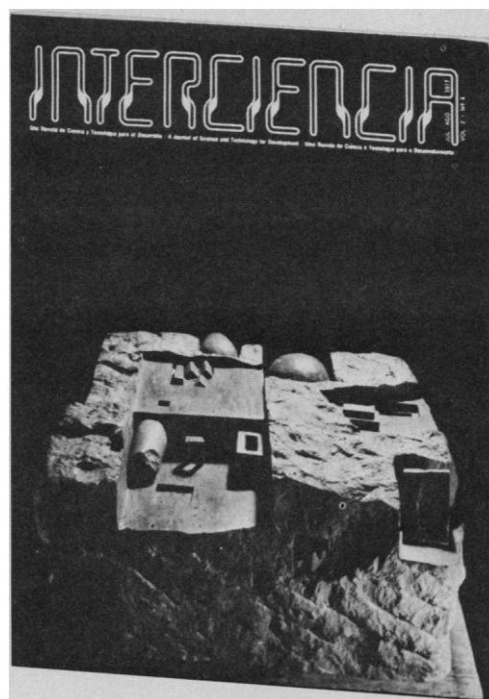
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