

## Notas de epílogo

### De Wingspread a Yokohama

#### Página 428

Kolata, G., 19 de marzo, 1996. *Chemicals that mimic hormones spark alarm and debate*. New York Times: C10.

Hertsgaard, M., 7 de abril, 1996. *A world awash in chemicals*. New York Times Book Review: 25.

Dowie, M., 6 de julio, 1998. *What's wrong with the New York Times' science reporting?* Nation 13-14, 16-19.

#### Página 431

Ohsako, S.; Sakaue, M.; Ishimura, R.; Kurosawa, S.; Yonemoto, J.; Tohyama, C., 1999. *Effects of low-dose bisphenol-A on rat spermatogenesis*. Trabajo presentado en el Simposio Internacional de Kobe Sobre Disruptores Endocrinos, Diciembre.

Gupta, C., 2000. *Fetal exposure to low doses of estrogenic chemicals diethylstilbestrol (DES), bisphenol A and Aroclor increase prostate size and androgen receptors in vivo and in vitro in mice* (en prensa).

Awao, S.; et al., 1999. *Neurotoxic dose of bisphenol-A and tributyltin did not affect reproductive function but abolished sexual dimorphic behavior in rats*. Presentado en el Simposio Internacional de Kobe sobre Disruptores Endocrinos, Diciembre.

Matsui, T., 14 de diciembre, 1999. *Low dose can have impacts in vivo: the debate from last year is over*. Daily Yomiuri Newspaper.

#### Página 434

National Research Council. 1999. *Hormonally Active Agents in the Environment*. Washington, D.C.: National Academy Press.

Krimsky, S., 2000. *Hormonal Chaos: The Scientific and Social Origins of the Environmental Endocrine Hypothesis*. Baltimore: The Johns Hopkins University Press.

Entrevista con Stephen Safe, documental de PBS Frontline *Fooling with Nature*. <http://www.pbs.org/wgbh/pages/frontline/shows/nature/interviews/>

Safe, S., 1997. Editorial: *Xenoestrogens and breast cancer*. New England Journal of Medicine 337:1303-1304.

#### En busca de respuestas

#### Un consenso científico emergente

#### Página 441

U. S. Environmental Protection Agency, Technical Panel, Office of Research and Development, Office of Prevention, Pesticides and Toxic Substances. 1997. *Special Report on Environmental Endocrine Disruptors: An Effects Assessment and Analysis*. EPA/630/R-961012. Washington, D.C.: U. S. Environmental Protection Agency.

#### El cerebro y la conducta

#### Página 444

Laessig, S. A.; McCarthy, M. M.; Silbergeld, E., 1999. *Neurotoxic effects of endocrine disruptors*. Current Opinion in Neurology 12:745-751.

## Página 444

Consensus Statement from the Work Session on Environmental Endocrine-Disrupting Chemicals: *Neural, Endocrine, and Behavioral Effects*. 1998. *Toxicology and Industrial Health* 14(1-2-):1-8.

## Página 445

Jacobson, J. L.; Jacobson, S. W., 1996. *Intellectual impairment in children exposed to polychlorinated biphenyls in utero*. *New England Journal of Medicine* 335:783-789.

## Página 446

Stewart, P.; Reihman, J.; Lonky, E.; Darvill, Y.; Pagano, J., 2000 *Prenatal PCB exposure and neonatal behavioral assessment scale (NBAS) performance*. *Neurotoxicology and Teratology* 22:21-29.

## Página 447

Stewart, P.; Darvill, T.; Lonky, E.; Reihman, J.; Pagano, J.; Bush, B., 1999. *Assessment of prenatal exposure to PCBs from maternal consumption of Great Lakes fish: An analysis of PCB pattern and concentration*. *Environmental Research* 80(2 Part 2):S87-S96.

## Página 448

Koopman-Esseboom, C.; Weisglas-Kuperus, N.; de Ridder, M. A. J.; Van der Paauw, C.; Tuinstra, L. G. M. T.; Sauer, P. J. J., 1996. *Effects of polychlorinated biphenyl/dioxin exposure and feeding type on infants' mental and psychomotor development*. *Pediatrics* 97(5):700-706.

Goldey, E. S.; Kehn, L. S.; Lau, C.; Rehnberg, G. L; Crofton, K. M., 1995. *Developmental exposure to polychlorinated biphenyls (Aroclor*

1254) reduces circulating thyroid hormone concentrations and causes hearing deficits in rats. *Toxicology and Applied Pharmacology* 235:77-88.

Brucker-Davis, F., 1998. *Effects of environmental synthetic chemicals on thyroid function*. *Thyroid* 8(9):827-856.

## Disminución de la resistencia a las enfermedades

Página 449

*Consensus Statement from the Work Session on Chemically Induced Alterations in the Developing Immune System: The Wildlife/Human Connection*. 1996. *Environmental Health Perspectives* 104(4):807-808.

Repetto, R.; Baliga, S. S., 1996. *Pesticides and the Immune System: the Public Health Risks*. Washington, D.C.: The World Resources Institute (Instituto de Recursos Mundiales-wri.org).

Página 450

Weisglas-Kuperus, N.; Nynke, T.; Sas, T. C. J.; Koopman-Esseboom, C.; Van Der Zwan, C. W.; Deudder, M. A. J.; Beishuizen, A.; Hooijkaas, H.; Sauer, P. J. J., 1995. *Immunologic effects of background prenatal and postnatal exposure to dioxins and polychlorinated biphenyls in Dutch infants*. *Pediatric Research* 38(3): 404-410.

Rothman, N.; Cantor, K. P.; Blair, A.; Bush, D.; Brock, J. W.; Helzlsouer, K.; Zahm, S. H.; Needham, L. L.; Pearson, G. R.; Hoover, R. N.; Comstock, G. W.; Strickland, P. T., 1997. *A nested case-control study of non-Hodgkins lymphoma and serum organochlorine residues*. *Lancet*. 350:240-244.

## Tendencias reveladoras en la salud reproductiva humana

Página 451

Paulozzi, L. J.; Erickson, J. D.; Jackson, R. J., *Hypospadias trends in two U. S. surveillance systems*. *Pediatrics* 100:831-834.

## Página 452

Paulozzi, L. J., 1999. *International trends in rates of hypospadias and cryptorchidism*. Environmental Health Perspectives 107:297-302.

## Página 453

Foster, W.; Chan, S.; Platt, L.; Hughes, C., 1999. *In utero exposure of the human fetus to xenobiotic endocrine disrupting chemicals: Detection of organochlorine compounds in samples of second trimester human amniotic fluid*. 81st Annual Meeting of the Endocrine Society. June 12-15, San Diego, CA.

Garry, V. F.; Schreinemachers, D.; Harkins, M. E.; Griffith, J., 1996. *Pesticide applicers, biocides, and birth defects in rural Minnesota*. Environmental Health Perspectives 104(4):394-399.

### **El debate sobre la cantidad de espermatozoides y la salud reproductiva en los varones**

## Página 456

Swan, S. H.; Elkin, E. P.; Fenster, L., 1997. *Have sperm densities declined? A re-analysis of global trend data*. Environmental Health Perspectives 105:1228-1232.

## Página 456

Irvine, S.; Cawood, E.; Richardson, D.; MacDonald, E.; Aitken, J., 1996. *Evidence of deteriorating semen quality in the United Kingdom: Birth cohort study in 577 men in Scotland over 11 years*. British Medical Journal 312(7029):467-471.

Fisch, H.; Feldshuh, J.; Goluboff, E. T.; Broder, S. J.; Olson, J. H.; Barad, D. H., 1996. *Semen analyses in 1,283 men from the United States over a 25-year period: No decline in quality*. Fertility and Sterility 65(5):1009-1014.

Paulsen, A. C.; Berman, N. G.; Wang, C., 1996. *Data from men in greater Seattle area reveals no downward trend in semen quality:*

*Further evidence that deterioration of semen quality is not geographically uniform.* Fertility and Sterility 65(5):1015-1020.

Página 458

*Sperm Counts Down.* Julio 8, 1998. Asahi News Service.

Mori, C., 1999. *Spermatogenesis in Japanese Men. Presented at Kobe International Symposium on Endocrine Disruptors*, December.

Página 459

Guo Nei., May 26, 1999. *Pollution Could Affect Fertility.* China Daily.

*Pollution hits Indian men's sperm count.* July 9, 1998. Agence France Presse.

Página 460

Pajarinen, J.; Laippala, P; Penttila, A; Karhunen, P. J., 1997. *Incidence of disorder of spermatogenesis in middle aged Finnish men, 1981-91: Two necropsy series.* British Medical Journal 314(7073): 13-18.

Página 462

Bergstrom, R., Adami, H. O.; Mohner, M.; Zatonski, W.; Storm, H.; Ekblom, A.; Tretli, S.; Teppo, L.; Akre, O.; Hakulinen, T., 1996. *Increase in testicular cancer incidence in six European countries: A birth cohort phenomenon.* Journal of the National Cancer Institute. 88(11):727-733.

Zheng, T.; Holford, T. R.; Ma, Z.; Ward, B. A.; Flannery, J.; Boyle, P., 1996. *Continuing increase in incidence of germ-cell testis cancer in young adults: Experience from Connecticut, USA, 1935-1992.* International Journal of Cancer 65(6):723-729.

McKiernan, J.; Goluboff, E.; Liberson, G.; Golden, R.; Fisch, H., 1999. *Rising risk of testicular cancer by birth cohort in the United States from 1973 to 1995*. Journal of Urology 162(2):361-3.

Página 463

Niels Skakkebaek, N. E., 1999. *Risk of testicular cancer in subfertile men: Case-control study*. British Medical Journal 318:559-562.

### El cerebro: el órgano sexual más importante

Página 464

Christian, M.; Gillies, G., 1999. *Developing hypothalamic dopaminergic neurones as potential targets for environmental estrogens*. Journal of Endocrinology 160:R1-R6.

Coghlan, A., Julio 18, 1998. *Sex on the brain*. New Scientist 159(2143):4.

Página 465

Uchida, K.; Kobayashi, Y.; Sato, T.; Ohta, Y.; Iguchi, T., 1999. *Effects of estrogenic compounds on osteogenesis of mice in utero*. Trabajo presentado en el Simposio Internacional de Kobe sobre Disruptores Endocrinos, Diciembre.

Howdeshell, K. L.; Hotchkiss, A. K.; Thayer, K. A.; Vandenberg, J. G., vom Saal, F. S., 1999. *Exposure to bisphenol A advances puberty*. Nature 401(6755):763-764.

Herman-Giddens, M. E.; Slora, E. J.; Wasserman, R. C.; Bourdony, C. J.; Bhapkar, M. V.; Koch, G. G.; Hasemeier, C. M., 1997. *Secondary sexual characteristics and menses in young girls seen in office practice: A study from the Pediatric Research in Office Settings Network*. Pediatrics 99(4):505-512.

## Los plásticos y la exposición humana a disruptores endocrinos

### Página 467

Byron, J., 1998. *Suspected endocrine disruptors migrate from plastic food packages*. Pesticide and Toxic Chemical News.

Biles, J. E.; White, K. D.; McNeal, T. P.; Begley, T. H., 1997. *Determination of bisphenol-A in reusable polycarbonate food-contacts and migration to food-simulating liquids*. Journal of Agricultural and Food Chemistry 45:3541.

### Página 468

Raloff, J., 7 de agosto, 1999. *What's coming out of baby's bottle?* Science News Online 156(6). Disponible en: [http://www.sciencenews.org/sn\\_arc99/8\\_7\\_99/food.htm](http://www.sciencenews.org/sn_arc99/8_7_99/food.htm).

### Página 468

Takao, Y.; Lee, H. C.; Ishibashi, Y.; Kohra, S.; Tominaga, N.; Arizono, K., 1999. *Fast screening method for bisphenol A in environmental water and in food by solid-phase microextraction (SPME)*. Journal of Health Science 45:39.

Vom Saalm, F. S.; Cooke, P. S.; Buchanan, D. L.; Palanza, P.; Thayer, K. A.; Nagel, S. C.; Parmigiani, S.; Welshons, W. V., 1998. *A physiologically based approach to the study of bisphenol A and other estrogenic chemicals on the size of reproductive organs, daily sperm production, and behavior*. Toxicology and Industrial Health 14:239-260.

### Página 471

Pérez, P.; Pulgar, R.; Olea-Serrano, F.; Villalobos, M.; Rivas, A.; Metzler, M.; Pedraza, V.; Olea, N., 1998. *The estrogenicity of bisphenol A-related diphenylalkanes with various substituents at the central carbon and the hydroxy groups*. Environmental Health Perspectives 106:167-174.

## Disruptores endocrinos: naturales frente a sintéticos

Página 472

Arnold, S. F.; Collins, B. M.; Robinson, M. K.; Guillette, L. J.; McLachlan, J. A., 1996. *Differential interaction of natural and synthetic estrogens with extracellular binding proteins in a yeast estrogen screen*. Steroids 61(11):642-646.

## Mezclas químicas y sinergia

Página 474

Arnold, S. F.; Klotz, D. M.; Collins, B. M.; Vonia, P. M.; Guillette, L. J.; McLachlan, J. A., 1996. *Synergistic activation of estrogen receptor with combinations of environmental chemicals*. Science 272:1489-1492.

McLachlan, J. A., 1997. Letter: *Synergistic effects of environmental estrogens: Report withdrawn*. Science 277:462-63.

Página 475

Safe, S., 20 de agosto, 1997. Editorial: *Another enviro-scare debunked*. Wall Street Journal.

Krimsky, S., 2000. *Hormonal Chaos: The Scientific and Social Origins of the Environmental Endocrine Hypothesis*. Baltimore, MD: The Johns Hopkins University Press.

Bemis, J. C.; Seegal, R., 1999. *Polychlorinated biphenyls and methylmercury act synergistically to reduce rat brain dopamine content in vitro*. Environmental Health Perspective 107(11):879-885.

Página 476

Porter, W. P.; Jaeger, J. W.; Carlson, I. H., 1999. *Endocrine, immune, and behavioral effects of aldicarb (carbamate), atrazine (triazine), and nitrate (fertilizer) mixtures at groundwater concentrations*. Toxicology and Industrial Health 15(1-2):133-150.

## La fauna en peligro

### Página 477

Fairchild, W. L.; Swansburg, E. O.; Arsenault, J. T.; Brown, S. B., 1999. *Does an association between pesticide use and subsequent decline in the catch of Atlantic salmon (*Salmo salar*) represent a case of endocrine disruption?* Environmental Health Perspectives 107(5): 349-357.

### Página 479

Raloff, J., 18 de mayo, 1999. *Pollutant waits to smite salmon at sea.* Science News Online 155(19). Available: [http://www.science-news.org/sn\\_arc99/5\\_8\\_99/fob3.htm](http://www.science-news.org/sn_arc99/5_8_99/fob3.htm)

Brown, S. B.; et al., 1998. *Effects of water-borne 4-nonylphenol on Atlantic salmon (*Salmo salar*) smolts.* SETAC 19th Annual Meeting. November, Charlotte, NC USA.

### Página 480

Crain, D. A.; Guillette Jr., L. J.; Pickford, D. B.; Percival, H. F.; Woodward, A. R., 1998. *Sex-steroid and thyroid hormone concentrations in juvenile alligators (*Alligator Mississippiensis*) from contaminated and reference lakes in Florida, USA.* Environmental Toxicology and Chemistry 17(3):446-452.

### Página 481

Jobling, S.; Nolan, M.; Tyler, C. R.; Brighty, G., Sumpter, J. S., 1998. *Widespread sexual disruption in wild fish.* Environmental Science and Toxicology 32:2498-2506.

### Página 483

Goodbred, S. L.; Gilliom, R. J.; Gross, T. S.; Denslow, N. P.; Bryant, W. L.; Schoeb, T. R., 1997. *Reconnaissance of 17 $\beta$ -Estradiol, 11-*

*Ketotestosterone, Vitellogenin, and Gonad Histopathology in Common Carp in United States Streams: Potential for Contaminant-Induced Endocrine Disruption.* U. S. Geological Survey. Open-File Report 96-627.

Henny, C. J.; Grove, R. A.; Hedstrom, O. R., 1996. *A Field Evaluation of Mink and River otter on the Lower Columbia River and the Influence of Environmental Contaminants: Final Report.* Submitted to The Lower Columbia River Bi-State Water Quality Program. No. ODEQ 143-94, WDE C9500038.

Página 484

Fort, D. J.; Rogers, R. L.; Copley, H. F.; Bruning, L. A.; Stover, E. L.; Helgen, J. C.; Burkhart, J. G., 1999. *Progress toward identifying causes of maldevelopment induced in Xenopus by pond water and sediment extracts from Minnesota, USA.* Environmental Toxicology and Chemistry 18(10):2316-2324.

Página 485

Ouellet, M.; Bonin, J.; Rodrigue, J.; DesGranges, J. L.; Lair, S., 1997. *Hindlimb deformities (Ectromelia, Ectrodactyly) in free-living anurans from agricultural habitats.* Journal of Wildlife Diseases 1:95-104.

## Respondiendo al reto

Página 494

*Endocrine Disruptor Screening and Testing Advisory Committee. Final report (Informe definitivo).* Washington, D.C.: Environmental Protection Agency, 1998.

El sitio web para el informe definitivo de EDSTAC es:

<http://www.epa.gov/scipoly/oscpendo/history/finalrpt.htm>

El sitio web de EDSTAC es: <http://www.epa.gov/scipoly/oscpendo/index.htm>

## Página 497

Wargo, J., 1996. *Our Children's Toxic Legacy: How Science and the Law Fail to Protect Us from Pesticides*. New Haven, Conn: Yale University Press.

## Página 497

U. S. General Accounting Office. 13 de abril 1990. *Toxic Substances: EPA's Chemical Testing Program Has Made Little Progress*. Washington, D.C.: U. S. Government Printing Office.

U. S. General Accounting Office. Octubre 1992. *Reproductive and Developmental Toxicants: Regulatory Actions Provide Uncertain Protection*. Washington, D.C.: U. S. Government Printing Office.

Sachs, N., 1999. Blocked Pathways: *Potential Legal Responses to Endocrine Disrupting Chemicals*. Columbia Journal of Law 24(2):289-353.

Consensus Statement from the Work Session on Health Effects of Contemporary-Use Pesticides: the Wildlife/Human Connection. 1999. *Toxicology and Industrial Health* 15, 1-5.