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The United States and Biological Warfare: Secrets From the Early Cold War and Korea

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Biological Warfare

The United States and Biological Warfare: Secrets From the Early Cold War and Korea, by Stephen Endicott and Edward Hagerman, 274 pp, with illus, \$29.95, ISBN 0-253-33472-1, Bloomington, Indiana University Press, 1998.

THIS BOOK IS WRITTEN IN THE STYLE OF an investigative news report. The authors accuse US and Canadian forces of having waged offensive biological warfare by using artificially infected insects as vectors during the Korean campaign. We concede that all major powers have experimented with biological warfare agents.¹ However, this book suffers from many defects, specifically the use of anecdotal data that appear questionable when seen in the light of current science. Terms like “encephalitis” and “meningitis” are thrown at the reader without definition.

For example, how were the diagnoses made and what kind of encephalitis or meningitis was encountered? Tick-borne, herpes, and Japanese encephalitis were known to be present in much of Asia for decades prior to the Korean War and had been described as early as 1871.^{2,3} The flaviviruses causing Japanese encephalitis and dengue fever are transmitted by mosquitoes, are present throughout most of South and Southeast Asia, and are now spreading east and into the South Pacific islands. Hantavirus, responsible for Korean hemorrhagic fever, was there prior to the invasion from the North.⁴ Scrub and murine typhus have been endemic in much of Asia for as long as medical records have been available. They were a major health problem for Allied troops during World War II and for the British during the Malayan engagement. Plague, largely transmitted to humans by fleas, has been described in literature since antiquity. It has been associated with war, breakdown of sanitation, and migration of populations. It is hard to accept the cited reports, originating in China dur-

ing the war, that plague was spread by flea-containing bomblets dumped by US Air Force aircraft over the devastated Korean battlefields. It is even harder to believe that spreading ticks or mites, artificially infested with rickettsiae, can cause epidemics of typhus. The authors cite mostly Chinese anecdotal reports that might be convincing to lay persons but hardly to an epidemiologist. Here is one example of “evidence” from the book:

Though plague was endemic in parts of northeast China, none had been reported in Korea since 1912. Until the end of February 1952, contagious diseases such as recurrent fever, smallpox and typhus existed among civilians and in some individuals in the army, according to headquarters of the Chinese army in Korea, but the serious contagious diseases plague and cholera were not found among army personnel or civilians. But a month later, the Chinese army in Korea had diagnosed 16 cases of plague or something similar to plague among its personnel in widely scattered areas. A number of dead or live rats that died suddenly were found and in 3 cases they were diagnosed with plague. In March there were 44 cases of encephalitis and meningitis in the army of which 16 were fatal; 5 cholera cases were discovered near Pyongyang with 3 deaths.

Was this an unusual number of cases in a large army with less than state-of-the-art medical services in an area where all these infections were long endemic? All those diseases also presented threats to armies during World War II and in Vietnam. We now see a resurgence of vivax malaria along the demilitarized zone of Korea as well as scattered cases of hantavirus infection. Is this also biological warfare?

The reviewers have no doubt that the respected aging Chinese scientists interviewed by the authors were true believers in what was once the official party line on biological warfare. None of them had modern training in epidemiology. Chinese medical science, at the time of the Korean War and for at least one decade thereafter, remained isolated from medical advances. It would seem more

likely that the appearance of various forms of encephalitis, bacterial meningitis, plague, and cholera on and near the Korean battlefields were natural occurrences and were due to disruption of the social fabric of society, crowding, increased mobility of populations and their pests, breakdown of sanitation, and lack of pest control and adequate medical services.

Virtually every major military power, including the United States, Canada, and Britain, has experimented with and stocked chemical and biological warfare agents in the past.¹ Some such efforts go back to antiquity, as when a Polish general catapulted rabid dogs into a beleaguered city and wells were contaminated with dead bodies. Accusing adversaries of using biological weapons has been practiced not only by the Soviets and Chinese. Our government accused the Russians and Vietnamese of dropping trichothecene mycotoxins, derived from *Fusarium* and related fungi, on Laotian and Cambodian villagers as so-called “Yellow Rain.” No proof that this happened was ever produced.^{5,6} It is, however, established that the Soviets experimented with anthrax bacilli and even stockpiled them as potential weapons. They managed to have at least one accidental exposure of civilians in Siberia that resulted in many deaths.⁷ Allies also experimented with anthrax spores during 1942 and managed to experimentally contaminate an island off the coast of Scotland, making it uninhabitable for decades thereafter.⁸ General Shiro Ishi's group in Manchuria experimented extensively in 1940 with insect-bearing microbes. These experiments were of an offensive nature, and the Chinese, who possessed data on the experiments, and the Soviets tried and ex-

Edited by Harriet S. Meyer, MD, Contributing Editor; Jonathan D. Eldredge, MLS, PhD, University of New Mexico, Health Sciences Center Library, Journal Review Editor; adviser for new media, Robert Hogan, MD, San Diego.

ecuted some of the culprits.⁹ Allied military scientists did indeed study insect-borne bacterial, parasitic, and viral zoonoses and still do. The 406th US Army Medical Laboratory in Japan and later medical researchers of the Southeast Asia Treaty Organization and the Armed Forces Research Institute of Medical Sciences in Bangkok, Thailand, investigated dengue fever, malaria, Japanese encephalitis, plague, rabies, hepatitis, and typhus. Many of their publications led to better prevention and treatment of these diseases.

The authors also allude to a number of insect experiments that do not seem logical, based on the level of knowledge that existed in 1950 as well as today. In many instances, insect vectors of particular diseases are species-specific to the pathogen (one insect species to one pathogen) or to a few closely related ones. Infecting an insect that is not the normal host of a pathogen may result in the pathogen being physically present but the unnatural insect host not being able to transmit it. At other times, the authors refer to reports from Chinese scientists of nonindigenous insects found following mysterious aircraft flights. There was no opportunity to verify those identifications, nor is there any indication of any understanding that the presence of these insects may have been due to less sinister causes.

Alleged examples of insect dispersion during periods when ambient temperatures were below freezing do not make much sense as a cause of epidemics. The authors are not convincing in their discussion of the use of "insect bombs" dropped by Sabre jets traveling at more than 300 mph as effective methods for distributing insects. For most arthropods, the impact alone would result in extensive mortality. How minute chigger mites could have survived the ordeal, survived an environment outside their normal range, and gone on to transmit scrub typhus is hard to conceive. Even the reported logistics of introducing infected mosquitoes do not seem plausible. There is no attempt to logically explain how this could be done. One of the reviewers

once attempted to capture mosquitoes with a net, driving a car at 20 to 25 mph: none remained alive. Some of the insects allegedly found were pests of plants and thereby would have little role in the transmission of human disease. Although arthropods and arthropod-borne diseases have shaped military campaigns (eg, Napoleon's Russian campaign), the authors seem to attribute a lot more to the power of artificially reared and distributed arthropods than would seem realistic. That the authors do not include discussions with any US researchers from that era on the work in offensive or defensive biowarfare weakens their arguments. Natural epidemics are common during times of war; blaming an epidemic of dysentery and scattered cases of other human disease on US biowarfare insect research is not convincing.

Disturbing are the rather convincing and not new allegations that US military scientists, with the connivance of American occupation authority, harvested data from criminal Japanese experiments on Chinese and Allied prisoners in Manchuria. No Japanese doctor involved in the Manchurian experiments was ever indicted by Western war crimes courts. US officials must have protected Lieutenant General Shiro Ishi and his senior officers from the hangman, for he lived out his life span as a respected member of the Japanese academic medical community. He most certainly was responsible for hundreds of deaths at the infamous Unit 731 in Manchuria.¹⁰

This book makes interesting reading but may only confuse historians studying the Korean campaign, a bloody conventional war that was waged by the United Nations to defend South Korea from an invader who, even now, presents a threat to us all.

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NEW MEDIA

Grants

GrantSlam: Automation of the Public Health Service Grant Application Process, six 3.5-in diskettes, requirements: Macintosh: 48MB memory with 150MB hard disk space (64MB with 175MB disk space recommended); Windows: 386 or higher with 1MB extended memory and 10MB hard disk space (Pentium best, with 4MB memory and 20MB hard disk space), documentation 86-pp manual, \$295 PC, \$399 Mac, Portland, Ore, Cayuse (503-297-2108; info@cayuse.com), 1999.

WRITING A NATIONAL INSTITUTES OF Health (NIH) grant proposal requires expressing your themes, preliminary data, and how you will analyze the new data if the grant is awarded. This requires, among other things, creative thinking and mental concentration. This process is often disrupted by time-consuming trial and error in trying to type or print out forms. Although NIH grant proposal forms can be obtained from research offices or Internet sites at no cost, there is little support available to overcome printing and data entry problems.

A frequent problem is that entering certain data shifts the columns or characters on a particular sheet, thus disrupting the integrity and appearance of the form on printout. A second com-

mon problem is that, after correctly filling out the information on the fact sheet, budget sheets, etc, they do not print out the way they should. A single page may overrun into two. Other problems could be detailed, but the point is that, instead of devoting your remaining time, before the deadline, toward polishing the body of the proposal, you must spend time on the obligatory forms themselves. Unfortunately even small changes can throw off the appearance of the form that you just spent hours getting in shape.

Unless you have a staff ready in waiting or until the NIH puts their forms on the Web, you will have to rely on hard work or a software program that will do this. *GrantSlam* by Cayuse, Inc (<http://www.cayuse.com>), is a program designed to make the form part of the grant application easy. The underlying structure is that of a database rather than a word processor.

I evaluated their Windows-based grant application programs (Macintosh programs are also available) by selecting the most commonly used NIH application, the PHS 398, and the new modular forms that went into effect June 1, 1999. The final printouts were done on both a Hewlett Packard Laserjet 4M and an Epson 900 inkjet printer. The program did what it said it would: it made filling out the forms, including the budgets, rather easy, and the printouts were accurate duplications of the NIH forms. In the process of filling out information including budgets, linked information appeared on the appropriate sheet, reducing the need for duplicate entry and errors. This meant that mathematical calculations based upon a set of values would appear on the face sheet as total direct and indirect costs, and the checklist sheet had the institutional indirect costs.

Copies of the NIH's instructions and Internet links are also provided. The manual is relatively short and simple but important to read. When the answer to a question was not clear in the manual or on the Cayuse Web site, the question was answered patiently on the telephone (not toll-free) by support

staff. A call after regular business hours was answered by a service that can page one of the support people. The company appears to stand behind its product and provide support, particularly around grant deadline times.

The product lists for \$279 for the basic PHS 398 package. Although the price may seem high, on a per hour basis of your time, it is probably worth it. For use with several grants, it definitely is, and it is very inexpensive for a department to install on one computer (as per licensing agreement) and have each investigator have separate files for a particular proposal. The body of the proposal can be written separately on whatever word processor is being used.

In summary, *GrantSlam* does what its company claims and has excellent support service.

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Medicine

Harrison's 14 Online, edited by Eugene Braunwald, Anthony S. Fauci, Kurt J. Isselbacher, et al, online individual subscription \$89, institutional subscription prices begin at \$650 for two users, New York, NY, McGraw-Hill Health Professional Division, <http://www.harrisonsonline.com>, 1999.

THE VENERATED LEADING INTERNAL medicine textbook has now become fully electronic, coming on the heels of its second CD-ROM release. I was expecting to find a significant advantage over the text or CD-ROM. The overall architecture is similar to other Web sites, with buttons on the left side of the screen linking to topic updates and clinical trial articles selected by the chapter author or colleagues. Pre-Tests, a commercial McGraw-Hill product, are made available with buttons linking to relevant topics.

To their credit, the producers of this edition have imported stunning graphics. The dermatology atlas displays necrobiosis lipoidica and acanthosis nigricans lesions so vivid that they appear almost three-dimensional. In fact, some of the infectious disease and cardiology illustrations are not available in the

print version of *Harrison's Principles of Internal Medicine*, 14th edition. However, minor errors have slipped into the online version. As an example, in the diabetes chapter, the legend for figure 334-2, a chart depicting the diabetic "honeymoon period," refers to "ketoacidosis & mdashfor" and "acute appendicitis & mdashhis."

Although McGraw-Hill promotes this version as "medicine updated daily by authorities you trust," I was disappointed that the quality of the references was not equal to the hype. As an example, in the diabetes chapter, I scrutinized the "New References" for June and July 1999. At that time, the American Diabetes Association's January 1998 practice guidelines from *Diabetes Care* were listed, but not the January 1999 update. This means that the online version was running 15 months behind what physicians can pull off of the shelf at any local medical library—not what we should expect of a constantly updated core source.

Updates do occur, however, in the most attractive feature of this product: the e-mail update that subscribers receive every two weeks. Recent updates have included "Prevention of Delirium in Hospitalized Geriatric Patients," "Minimally Invasive Coronary Surgery," and reports of published clinical trials that update the text. Clinical trials in one e-mail included "Treatment of Osteogenesis Imperfecta With Pamidronate," "Treatment of Hypertension in Patients With Diabetes Mellitus," and other topics of fairly widespread interest. Unfortunately, a commercial blurb appears at the end of these updates, pitching other McGraw-Hill textbooks and CDs. (Perhaps it is fair to mention that the publisher gives a discount as part of these offers, and the other products are chosen to be relevant to the update content.)

Some physicians are very Internet-invested, but many are not. I suspect most physicians will come around to the advantages of an online textbook when Internet capabilities are linked with all hospital wards and almost every medical office. Also, the advan-

tages of a textbook on a PC screen need to be more impressive for physicians by empowering us in a unique way. Although the online edition is relatively affordable (currently \$89 per year), it is actually more expensive than the text or CD-ROM alternatives, considering that the traditional versions appear every two to three years. I would prefer to pay a bit more for a resource that was a bit more current. I worry that staffing resources for this online endeavor might be insufficient. I believe busy practicing physicians or those of us with large administrative responsibilities would appreciate a clinical resource more powerfully linking literature search engines to a current text. I don't believe the current *Harrison's On-Line* is quite yet ready for our prime time.

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Anatomy

Sobotta Atlas of Human Anatomy, version 1.5, edited by R. Putz and R. Pabst, translated by Anna N. Taylor, 12th ed, one CD-ROM, requirements: IBM-compatible PC with MS Windows 3.1, 95, or NT, minimum 8MB RAM, 14MB free hard disk space, VGA screen with 256 colors, 5 pp user's guide, \$99, ISBN 0-683-30366-X, Baltimore, Md, Williams & Wilkins, 1998.

KNOWLEDGE OF ANATOMIC STRUCTURE is at the core of any advance in biomedical science and clinical medicine. And at the core of acquiring and maintaining that knowledge is a good quality anatomic atlas. In that context, the new CD-ROM version of the twelfth English edition of the *Sobotta Atlas of Human Anatomy*, edited by R. Putz and R. Pabst and translated by Anna N. Taylor, brings anatomic learning tools to a new level. Its achievement is marked by the quality of its illustrations, intuitive ease of use and maneuverability, and capacity for customization.

A classically strong text has been updated with a major emphasis on current methodology, which depicts accurately the direct relationship of anatomy and clinical practice. The 1495 illustrations are of exceptionally high quality, probably the best in the indus-

try. The classic quality of the original illustrations has been retained and enhanced by additional illustrations and new drawings of existing illustrations that incorporate important updates. Colors are used effectively to indicate various tissue and structural elements. These in turn are supplemented by illustrations produced by modern imaging techniques such as x-rays, ultrasound, magnetic resonance imaging, etc. Endoscopic surveys and color photographs of surgical procedures provide another dimension, permitting valuable comparison with operative sites in live subjects.

The illustrations and diagrams are in turn supplemented with tables, all the elements combining together in an exceptionally well-integrated, comprehensive picture of human anatomy.

The *Sobotta* CD atlas ranks highest among publications reviewed by this writer for its intuitive ease of use. It loads automatically and easily in Windows. Once loaded, the layout makes it very easy to figure out how to navigate the resources and how to manipulate features to satisfy one's own learning priorities.

With this product we have finally begun to realize, in the anatomy field at least, the great promise of relational databases. Simply placing data in a relational database does not automatically create a great product. Working with *Sobotta's* resource integration, with its feedback loops and overall symmetry, gave me the impression of actually moving through the body with the logic of a living organism—in contrast to flipping pages in a book. The user starts from the central point-and-click diagram of the body to select areas of interest. As a system is highlighted, a list of subsystems appears. When any of these subsystems are highlighted, corresponding thumbnail illustrations with legends appear below. A double click on the thumbnail takes the user to the full illustration. The legends accompanying the thumbnails greatly assist in finding the appropriate illustration quickly. There is good 200% zoom-and-back manipulation for close-up magnification.

The user can also move between the major anatomical systems by paging up and down. Another key moves the reader easily through the chosen subsystem, with the capacity to immediately cross-link to all related illustrations, tables, and definitions.

Two structural characteristics make this program particularly friendly. First is the overall symmetry: from wherever one may wander in the vast field of *Sobotta's* resources, it is always easy to find the way back home. Second, supplementing the first, is the session history tracking, letting the user retrace the path taken during the current session, up to the most recent 100 locations. This is not only convenient for normal use but actually encourages digression and spontaneous exploration.

The CD atlas is set up to allow the user to take a quiz on any selected illustration by optionally removing either the anatomic feature or the name it is linked to. Self-testing can be conducted with pop-up labels and reference lists or with no labels at all. At the end of each quiz, a final evaluation appears. The user then has the option of ending the quiz or continuing with a new illustration.

A notepad feature allows the student or teacher to make customized notes about any illustration. Another feature enables the user to bring together a selection of illustrations to create a customized slide show complete with notes. The order of slides can be rearranged at will. This is excellent for teachers or for students wishing to capture and synthesize a particular anatomical sequence.

The *Sobotta Atlas of Human Anatomy* on CD represents a major advance in anatomical CD-ROMs. It combines the best of several worlds: the strength of a recognized classical text, definitions based on another classic, *Stedman's Medical Dictionary*, plus a previously unachieved interactivity and general user friendliness.

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RECEIVED

Dermatology

A Philosophy of Practice of Surgical Pathology: Dermatopathology as Model, by A. Bernard Ackerman, 470 pp, with illus, \$95, ISBN 1-893357-02-3, Philadelphia, Pa, Ardor Scribendi, 1999.

Education

The Good CPD Guide: A Practical Guide to Managed CPD, edited by Janet Grant, Ellie Chambers, and Gordon Jackson, 120 pp, paper, £19.95, ISBN 1-873207-96-4, Sutton, UK, Reed Business Information, 1999 (continuing professional development).

Mission Management: A New Synthesis, vol 1, edited by Roger J. Bulger, Marian Osterweis, and Elaine R. Rubin, 264 pp, with illus, paper, \$25, ISBN 1-879694-13-1, Washington, DC, Association of Academic Health Centers, 1999.

Mission Management: A New Synthesis, vol 2, edited by Elaine R. Rubin, 408 pp, with illus, paper, \$30, ISBN 1-879694-12-3, Washington, DC, Association of Academic Health Centers, 1999.

Time to Heal: American Medical Education From the Turn of the Century to the Managed Care Era, by Kenneth M. Ludmerer, 516 pp, with illus, \$29.95, ISBN 0-19-511837-5, New York, NY, Oxford University Press, 1999.

Genetics

Behavioral Genetics: The Clash of Culture and Biology, edited by Ronald A. Carson and Mark A. Rothstein, 206 pp, with illus, \$39.95, ISBN 0-8018-6069-5, Baltimore, Md, Johns Hopkins University Press, 1999.

Health Systems

Board Work: Governing Health Care Organizations, by Dennis D. Pointer and James E. Orlikoff, 292 pp, with illus, \$39.95, ISBN 0-7879-4299-5, San Francisco, Calif, Jossey-Bass Publishers, 1999.

The Business Side of Medicine: A Survival Primer for Medical Students and Residents, by Ronald P. Kaufman, 160 pp, with illus, paper, \$25, ISBN 0-924674-72-5, Tampa, Fla, American College of Physician Executives, 1999.

Status One: Breakthroughs in High Risk Population Health Management, by Samuel Forman and Matthew Kelliher, 251 pp, with illus, \$43.95, ISBN 0-7879-4154-9, San Francisco, Calif, Jossey-Bass Publishers, 1999.

Imaging

Textbook of Fetal Ultrasound, edited by Richard Jaffe and The-Hung Bui, 335 pp, with illus, \$98, ISBN 1-85070-017-6, New York, NY, Parthenon Publishing Group, 1999.

Miscellaneous

Dishonesty in Health Research: Report on the National Committee's Work From 1994 to 1997, edited by Ragna Valen, 34 pp, paper, ISBN 82-12-01224-7, Oslo, Norway, Research Council of Norway, 1998 (bibliotek@forskningsradet.no).

Lesbian Health: Current Assessment and Directions for the Future, edited by Andrea L. Solarz (symposium, Washington, DC, October 1997), 234 pp, with illus, \$34.95, ISBN 0-309-06093-1, paper, \$19.95, ISBN 0-309-06567-4, Washington, DC, National Academy Press, 1999.

The Politics of Pure Science, by Daniel S. Greenberg, new edition, 311 pp, \$49, ISBN 0-226-30631-3, paper, \$15, ISBN 0-226-30632-1, Chicago, Ill, University of Chicago Press, 1967, 1999.

Proceedings of Enhancing Patient Safety and Reducing Errors in Health Care, edited by Adam L. Scheffler and Lorri Zipperer (symposium, Rancho Mirage, Calif, November 1998), 330 pp, with illus, paper, \$40, members \$29.95, Chicago, Ill, National Patient Safety Foundation at the AMA, 1999.

Risk Factor, by Charles Atkins, 256 pp, \$23.95, ISBN 0-312-20920-7, New York, NY, St Martin's Press, 1999 (mystery thriller about violent children).

Neonatology

Nurturing the Premature Infant: Developmental Interventions in the Neonatal Intensive Care Nursery, edited by Edward Goldson, 201 pp, with illus, \$49.95, ISBN 0-19-508570-1, New York, NY, Oxford University Press, 1999.

New Media

CARS '99: Computer Assisted Radiology and Surgery, edited by Heinz U. Lemke, Michael W. Vannier, Kiyonari Inamura, and Allan G. Farman (symposium, Paris, France, June 1999), 1111 pp, with illus, \$276.50, ISBN 0-444-50290-4, paper, ISBN ICSN 1191, New York, NY, Elsevier, 1999.

Orthopedics

The Orthopaedic Physical Examination, by Bruce Reider, photographs by David Christopher, 402 pp, with illus, \$49.95, ISBN 0-7216-7437-2, Philadelphia, Pa, WB Saunders Co, 1999.

Otolaryngology

Ear, Nose and Throat and Head and Neck Surgery: An Illustrated Colour Text, by R. S. Dhillon and C. A. East, 2nd ed, 122 pp, with illus, paper, \$35, ISBN 0-443-05955-1, New York, NY, Churchill Livingstone, 1999.

Psychiatry

Child Psychiatry: A Developmental Approach, by Philip Graham, Jeremy Turk, and Frank C. Verhulst, 3rd ed, 554 pp, with illus, paper, \$59.95, ISBN 0-19-262864-X, New York, NY, Oxford University Press, 1999.

Delusional Disorder: Paranoia and Related Illnesses, by Alistair Munro, 261 pp, with illus, \$75, ISBN 0-521-58180-X, New York, NY, Cambridge University Press, 1999.

Disordered Personalities, by David J. Robinson, 406 pp, with illus, \$34.95, ISBN 0-9682094-4-0, Port Huron, Mich, Rapid Psychler Press, 1999.

How Emotions Work, by Jack Katz, 304 pp, with illus, \$27.50, ISBN 0-226-42599-1, Chicago, Ill, University of Chicago Press, 1999.

Psychologists' Desk Reference, edited by Gerald P. Koocher, John C. Norcross, and Sam S. Hill III, 613 pp, with illus, \$65, ISBN 0-19-511186-9, New York, NY, Oxford University Press, 1998.

Study Guide to The American Psychiatric Press Textbook of Consultation-Liaison Psychiatry, by Jude Berman, James R. Rundell, and Michael G. Wise, 226 pp, paper, \$25, ISBN 0-88048-805-0, Washington, DC, American Psychiatric Press, 1999.

Public Health

Atlas of Leading and "Avoidable" Causes of Death in Countries of Central and Eastern Europe, edited by Péter E. Józán and Remigijus Prokhorskas, 323 pp, with illus, ISBN 963-215-146-1, Budapest, Hungary, Hungarian CSO Publishing House, 1997.

Humanitarian Crises: The Medical and Public Health Response, edited by Jennifer Leaning, Susan M. Briggs, and Lincoln C. Chen, 379 pp, with illus, \$45, ISBN 0-674-15515-7, Cambridge, Mass, Harvard University Press, 1999.

Reproduction

Male Fertility and Infertility, edited by Timothy D. Glover and Christopher L. R. Barratt, 271 pp, with illus, \$74.95, ISBN 0-521-62375-8, New York, NY, Cambridge University Press, 1999.

A Textbook of In Vitro Fertilization and Assisted Reproduction: The Bourn Hall Guide to Clinical and Laboratory Practice, edited by Peter R. Brinsden, 2nd ed, 564 pp, with illus, \$110, ISBN 1-85070-000-1, New York, NY, Parthenon Publishing Group, 1999.

WHO Laboratory Manual for the Examination of Human Semen and Sperm-Cervical Mucus Interaction, by World Health Organization, 4th ed, 128 pp, with illus, soft cover, \$39.95, ISBN 0-521-64599-9, New York, NY, Cambridge University Press, 1999.

Surgery

Instrumented Spinal Surgery: Principles and Techniques, by Jürgen Harms and Giuseppe Tabasso, with Rocco Cinanni, 198 pp, with illus, \$149, ISBN 0-86577-744-6, New York, NY, Thieme, 1999.

Thoracoscopic Spine Surgery, edited by Curtis A. Dickman, Daniel J. Rosenthal, and Noel I. Perin, 365 pp, with illus, \$189, ISBN 0-86577-785-3, New York, NY, Thieme, 1999.