

## NEWER TITLES IN THE BIOLOGICAL SCIENCES

**HUMAN VIRAL, BEDSONIAL AND RICKETTSIAL DISEASES: A Diagnostic Handbook for Physicians** by Abbas M. Behbehani, *The Univ. of Kansas School of Medicine, Kansas City. Foreword by Herbert A. Wenner.* '72, 370 pp., 6 il., 4 tables, \$16.50 ISBN 0-398-02228-3

**LABORATORY DIAGNOSIS OF VIRAL, BEDSONIAL AND RICKETTSIAL DISEASES: A Handbook for Laboratory Workers** by Abbas M. Behbehani. '72, 244 pp., 25 il., 7 tables, \$11.50 ISBN 0-398-02229-1

**ELEMENTARY MICROSTUDIES OF HUMAN TISSUES** by James V. Bradley. *Illustrations by Dennis Giddings.* '72, 376 pp., 175 il., 2 tables, \$15.75 paper ISBN 0-398-02240-2

**METHODS IN CLINICAL BACTERIOLOGY: A Manual of Tests and Procedures** by Dorothy Branson, *Methodist Hospital and Medical Center, St. Joseph, Missouri.* '72, 240 pp., 5 tables, \$6.50 paper ISBN 0-398-02241-0

**ARTIFICIAL CELLS** by Thomas Ming Swi Chang, *McGill Univ., Montreal, Canada.* '72, about 212 pp., 77 il., 5 tables ISBN 0-398-02257-7

**THE CLINICAL SIGNIFICANCE OF THE ESSENTIAL BIOLOGICAL METALS** by I. J. T. Davies, *The Univ. Hospital of Wales. Foreword by Robert Mahler.* '72, 140 pp. (5 1/2 x 8 1/2), \$9.75 ISBN 0-398-02535-5

**KERATINS: Their Composition, Structure and Biosynthesis** by R. D. B. Fraser and T. P. MacRae, *both of Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia, and G. E. Rogers, Univ. of Adelaide, Australia.* '72, 320 pp., 144 il., 24 tables, \$16.75 ISBN 0-398-02283-6

**BIOLOGY OF MAMMALIAN FERTILIZATION AND IMPLANTATION** edited by Kamran S. Moghissi and E. S. E. Hafez. *(21 Contributors)* '72, about 560 pp., 174 il. (11 in full color), 90 tables ISBN 0-398-02362-X

**TOLERANCE, AUTOIMMUNITY AND AGING** compiled and edited by M. Michael Sigel, *Univ. of Miami School of Medicine, and Robert A. Good. Introduction by Morris Rockstein. (9 Contributors)* '72, 196 pp., 76 il., 49 tables, \$18.75 ISBN 0-398-02413-8

**CHARLES C THOMAS  
PUBLISHER**

301-327 East Lawrence Avenue  
Springfield Illinois  
62717

## LETTERS

### Plutonium Plant Safety

If the purpose of Deborah Shapley's report (News and Comment, 5 Nov., p. 569) on the Dow Chemical Co., Rocky Flats Division, in Colorado was to increase the gap between what the Atomic Energy Commission (AEC) and the Rocky Flats management say and what listeners will believe, then her piece was well done. If, on the other hand, a reader can imagine that plutonium handling has evolved somewhat during the last 25 years, he might also believe that certain things that were condoned in the past are now forbidden and would be forbidden even without the strong environmental considerations that abound today.

By today's standards, yesterday's actions were crude, but today's concern with human welfare and the environment is historically recent. How long, for example, have seat belts been generally available for automobiles, and how old is the Environmental Protection Agency? Whether events in the 1950's are examples of managerial ineptness or reflect the developmental style of industrial America is pertinent to criticisms of the AEC, since the legality of the spending of funds hinges partly on the nature of current practice. Machines are known to wear out, and improved safety practices tend to require redesigned equipment. What is safe today is predictably unsafe tomorrow, even if the safety standards were to remain constant. There is no inconsistency in saying we are safe, and we need more funds to maintain safety, yet Shapley implies such an inconsistency.

Shapley's principal source on Rocky Flats contamination, E. A. Martell, suffers from his own credibility gap. For example, his original indictment (1) included soil analysis data for plutonium that failed to show a bimodal distribution of values, a prerequisite to establishing a Rocky Flats anomaly. His conclusion that off-site contamination was occurring was correct, but for the wrong reasons, since the 1968 barrel storage site was established as the source of contamination (2), not the 1969 fire suspected by Martell.

Although Martell's criticisms were useful in that they focused attention on this matter, his data and interpretations should be looked at more closely. Where he took duplicate samples at single sites, the reported analytical values differed

by a factor of 6 in one case and by a factor of 9 in another (1). His most recent contention (3) that off-site plutonium contamination is three times what has been determined by the Health and Safety Laboratory (HASL) is based, first, on his own interpretation of HASL data for the (compass) quadrant north-east of the plant, using a method which HASL people say abuses their data (4), and second, on the presumption that equal amounts of plutonium lie in the quadrants both southeast and west of the plant. Since only 17 percent of the winds blowing past Rocky Flats have an easterly component, and none of the strong winds do, it is difficult to understand how one-third of the effluent can end up west of the plant. Similarly, the quadrant southeast of the plant, which includes most of the Denver area, is protected by dominant northbound winds which take Denver air away via the Platte River valley; presumably Rocky Flats air goes the same route. I am disturbed that a scientist from the National Center for Atmospheric Research appears to ignore those two facts about local wind patterns.

Off-site contamination and exposure to workers inside the plant are trans-scientific problems, as described by Weinberg (Letters, 5 Nov. 1971, p. 546) and data are collected slowly. Studies of exposures to workers must naturally be restricted to those persons involved in incidents. If the 450 Rocky Flats workers (of 7700 total employees) in the Transuranium Registry seems a small number, one should realize that fewer than half of Rocky Flats employees work with plutonium in any way, and few of those collect significant exposures during their tenure. Perhaps the "smallness" of the 450 reflects the nature of the industrial safety record at Rocky Flats, which includes two disablement-free series of 24 million and 21 million man-hours, among the longest in American industry.

Shapley seems to imply that Dow is negligent in examining former (exposed) workers only on a voluntary basis, but on what grounds can we subpoena a reluctant nonemployee to submit to periodic examination? At best, these catch-as-catch-can experiments have minor scientific merit, in spite of their immense human interest. Their greatest value may lie in helping improve extrapolations from controlled experiments on animals.

Joseph Sykes, the Rocky Flats employee who refused to enter Building

776 after the 1969 fire, had received no significant exposure to plutonium. His concern about the risk apparently increased until he no longer felt compensated by the premium pay he had been receiving. To "just plain quit" for that sort of reason is a privilege that belongs to everyone, but no employer should have any after-the-fact obligations to a worker who makes such a decision.

It is easy, now, to see where past actions were inappropriate or worse, yet that same insight allows us to see better where our current ignorances lie and thus institute programs to improve our learning rate. The plutonium industry is really safer than it was 15 years ago, and in 5 years it will be safer still. The production of plutonium involves a multiplicity of dangers; the public should be made aware of them and demand that the industry invent and apply ever better safeguards. Public motivations in this matter are necessary, but many aspersions of the kind in Shapley's report will work to distort public judgment.

DONALD E. MICHELS

Route 2, Box 677,  
Golden, Colorado 80401

#### References

1. E. A. Martell, letter to Glenn T. Seaborg, 13 January 1970, reported in *St. Louis Post-Dispatch*, 11 February 1970, p. 1.
2. P. Krey and E. P. Hardy, "Plutonium in soil around the Rocky Flats plant" (Report No. HASL-235, Health and Safety Laboratory, Atomic Energy Commission, New York, 1970).
3. E. A. Martell, "Plutonium-239 and americium-241 fallout in the Denver area" (paper presented at the 17th Annual Bio-assay and Analytical Chemistry Meeting, Boulder, Colorado, 1971).
4. H. L. Volchok and J. H. Harley, discussion of paper by E. A. Martell (3).

Shapley states that the AEC has not "rigorously" followed up its plutonium workers except by means of the recently established United States Transuranium Registry. A series of plutonium workers at the Los Alamos Scientific Laboratory with a body burden of more than 0.2 microgram of plutonium-239 (0.01 microcurie) has been followed up for the past 27 years at the AEC's expense. At about 5-year intervals, 25 workers have had physical examinations and laboratory tests, including blood tests, x-rays of the bones, and urine assays for plutonium. Now that it is possible to measure insoluble or fixed plutonium in the lungs, these men are being called back to Los Alamos for further study, including lung burden measurements and cytological examinations of the sputum. Of the 25 workers, 20 have been examined as of 7 June

## High specific activity Cyclic Nucleotides: 3',5'-cyclic AMP [<sup>32</sup>P] 1-10Ci/mmole

**Adenosine 3',5'-cyclic phosphate, triethylammonium salt [<sup>32</sup>P] NEG-011**  
1-10Ci/mmole \$225/500μCi \$400/1mCi  
Aqueous solution in combi-vial in dry ice

**Adenosine 3',5'-cyclic phosphate, ammonium salt [<sup>3</sup>H(G)] NET-275**  
20-30Ci/mmole \$35/250μCi \$90/1mCi \$270/5mCi  
Ethanol:water, 1:1, in combi-vial in dry ice

**Adenosine 3',5'-cyclic phosphate, triethylammonium salt [8-<sup>14</sup>C] NEC-463**  
40-60mCi/mmole \$70/5μCi \$285/25μCi  
Ethanol:water, 1:1, in combi-vial in dry ice

**Guanosine 3',5'-cyclic phosphate, ammonium salt [<sup>3</sup>H(G)] NET-337**  
1-5Ci/mmole \$45/250μCi \$110/1mCi \$330/5mCi  
Ethanol:water, 1:1, in combi-vial in dry ice

**N<sup>6</sup>, 2'-O-Dibutyl adenosine 3',5'-cyclic phosphate, ammonium salt [<sup>3</sup>H(G)] NET-310**  
5-10Ci/mmole \$60/250μCi \$150/1mCi \$450/5mCi  
Ethanol:water, 1:1, in combi-vial in dry ice



**New England Nuclear**

575 Albany Street, Boston, Mass. 02118  
Customer Service (call collect) 617-482-9595

NEN Canada Ltd., Dorval, Quebec; NEN Chemicals GmbH, Dreieichenhain, Germany.

THE BOARD OF TRUSTEES of the Educational Council for Foreign Medical Graduates, Philadelphia, Pa., invites applications for the position of Executive Director.

The Executive Director of the Educational Council for Foreign Medical Graduates functions as the chief administrative officer for the programs of the ECFMG which include the conduct of examinations, the analysis of credentials and the certification of graduates of foreign medical schools.

The Executive Director is directly responsible to the Board of Trustees of the ECFMG.

Qualifications include extensive experience in predoctoral and postdoctoral medical education in the United States with a knowledge or interest in international medical education. Candidates for the position must have the M.D. degree and have had appropriate administrative experience.

The selected candidate should be available after September 1, 1972.

If qualified, please respond with a dossier to: Leonard D. Fenninger, M.D., National Institutes of Health, Bldg. 1, Room 111, Bethesda, Md. 20014.

**GRIND  
EMULSIFY  
DISINTEGRATE  
HOMOGENIZE  
SHRED  
BLEND  
OR MIX  
IN SECONDS!**



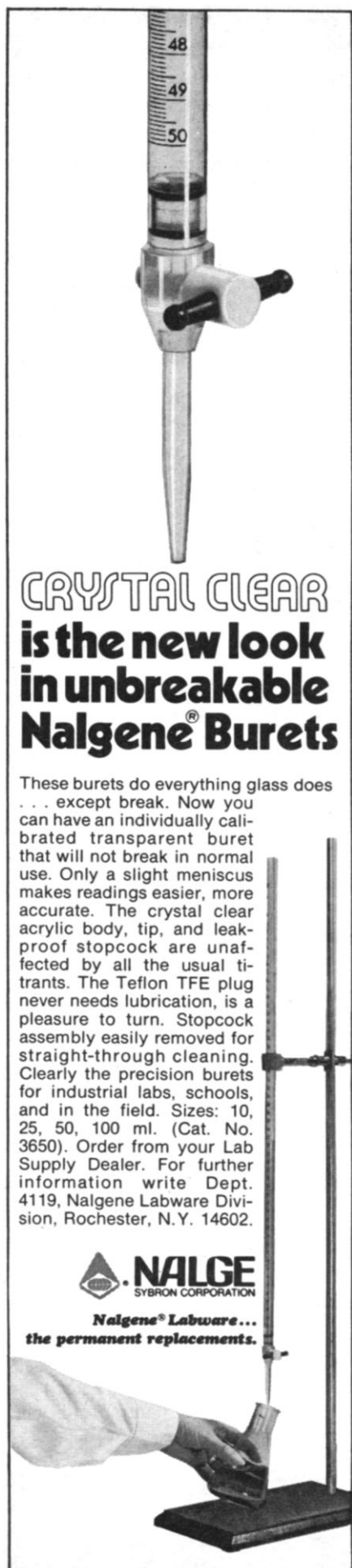
Waring's exclusive cloverleaf shape is hydrodynamically designed for perfect blending action. Container, cover, and blending assembly are stainless steel: easy to clean and trouble free. Waring also makes one-quart models, explosion-proof models, and a complete line of accessories—all warranted for one year of commercial use.



Write for our catalog.


**Waring**

Waring Products Division  
Dynamics Corporation of America  
New Hartford, Conn. 06057



**CRYSTAL CLEAR**  
is the new look  
in unbreakable  
**Nalgene® Burets**

These burets do everything glass does . . . except break. Now you can have an individually calibrated transparent buret that will not break in normal use. Only a slight meniscus makes readings easier, more accurate. The crystal clear acrylic body, tip, and leak-proof stopcock are unaffected by all the usual titrants. The Teflon TFE plug never needs lubrication, is a pleasure to turn. Stopcock assembly easily removed for straight-through cleaning. Clearly the precision burets for industrial labs, schools, and in the field. Sizes: 10, 25, 50, 100 ml. (Cat. No. 3650). Order from your Lab Supply Dealer. For further information write Dept. 4119, Nalgene Labware Division, Rochester, N.Y. 14602.

 **NALGE**  
SYBRON CORPORATION

**Nalgene® Labware . . .**  
the permanent replacements.

1972, and 3 others will be studied in the near future. So far, no evidence has been detected of biological damage due to radioactivity in the body. These men, as well as other plutonium workers at the Los Alamos Scientific Laboratory, are being urged to join the U.S. Transuranium Registry.

LOUIS H. HEMPELMANN  
*School of Medicine and Dentistry,  
University of Rochester,  
Rochester, New York 14620*

WRIGHT H. LANGHAM\*  
*Biomedical Research Group,  
Los Alamos Scientific Laboratory,  
Los Alamos, New Mexico 87544*

\* Deceased

### Ecological Assessment

Twin bills are pending in committees in both houses of Congress that would appropriate up to \$10 million to the National Academy of Sciences for a study "to assess the extent of the damage done to the environment of South Vietnam, Laos, and Cambodia as the result of the operations of the Armed Forces of the United States in such countries, and to consider plans for effectively rectifying such damage." These bills will not pass without the active support of the scientific community.

Following is the text of a supporting letter to Senator J. W. Fulbright (D-Ark.), chairman of the Senate Foreign Relations Committee, signed by 78 members of the Department of Zoology of the University of California at Berkeley:

We, the undersigned, members of the Department of Zoology, University of California at Berkeley, wish to voice our strong support of S. 3084, The Vietnam War Ecological Assessment Act of 1972, and we urge you to lend your own support to its passage. We are professional biologists, representing a wide range of political opinion, acting collectively in response to our individual concern as United States citizens.

Many of us are teachers or researchers in ecology, who have devoted our professional lives to furthering basic knowledge of the structure and function of ecosystems. One overwhelming result has emerged from our work and from that of others: ecosystems are enormously complex. This complexity makes it almost impossible to predict the subtle, indirect, and delayed consequences of even the most simple and seemingly minor changes made by human beings. The widespread disturbances of local ecosystems by our armed forces in Southeast Asia are neither simple nor minor, and the force

of their indirect and delayed effects may far outweigh their immediate and obvious consequences.

For this reason we feel that it is imperative that appropriate broad-scale, in-depth studies be initiated as soon as possible to determine both the short and long term ecological and human consequences of defoliation, deforestation, bombing, and chemical residues in the battlegrounds of Southeast Asia. Unlike the expense of reconstructing a building or a highway, the cost of ecological reconstruction rises sharply with every month's delay. A million dollars now may save hundreds of millions five years hence.

For all these reasons, and for the sake of future generations in Vietnam, Laos, and Cambodia, we implore you to support the Vietnam War Ecological Assessment Act.

We urge other concerned individuals and groups to support this legislation. Letters regarding the House bill (H.R. 13010) should be addressed to Representative Thomas E. Morgan (D-Pa.), chairman of the House Committee on Foreign Affairs.

MATTHEW H. GREENSTONE

ROBERT K. COLWELL

FRANK A. PITELKA

*Department of Zoology,  
University of California,  
Berkeley 94720*

### Suffering Legions?

When exposed almost continuously to colonies of white rats and mice, I noted the gradual onset of some personally very upsetting symptoms: puffing of the eyelids; watering of the eyes; nasal congestion; sneezing; and extreme respiratory discomfort, including wheezing and bronchial coughing. Continued research with rodents became difficult.

As a probable result of my experience with rodents, I am now allergic to most furry creatures, as well as to pollens and molds. Such an allergy limits my ability to work at pharmaceutical research, where the white rat is the animal of choice.

At first I thought my experience was unique and I had best suffer in silence, but I have recently met other biologists who suffer the same symptoms. Have I had the bad (or, hopefully, the good) fortune of meeting most of the world's supply of fellow sufferers, or might there be silently suffering legions?

DAVID A. GOODMAN

*Newport Neuroscience Center,  
Postal Service Box 4045,  
Irvine, California 92664*