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In the intensity of a voter's feelings, is a key to the error. Representative government, both in election of candidates and in legislative deliberations, works because intensities of feeling can be expressed (1). Failure to recognize that basic fact leads Savas to management solutions and evidently led Crowe (2) to despair.

Despite the 19th-century hamstringing of legislative power (at the state level) and the 20th-century strengthening of executive power (at all levels), the system can make collective choices only through the legislatures. Pole (3) has elegantly detailed the origins and consequences of this Whig heritage.

EDWIN T. HAEFELE
Resources for the Future, Inc.,
1755 Massachusetts Avenue, NW,
Washington, D.C. 20036

References

Chichagof Island, Alaska

For 2½ years we have been attempting to establish a wilderness area on Chichagof Island, a large island just to the north of our island here in southeastern Alaska. Chichagof has much to recommend it—mountains, sheltered coves and bays, lakes, and forests. It is the home of brown bear, bald eagles, swans, ducks, land otter, and sea otter, just to name a few species. Unfortunately it belongs, as does all of the southeast, to the Tongass National Forest.

We have repeatedly asked the U.S. Forest Service for help in establishing this area, and have been told it is impossible. Alternate sites in our area which incorporate representative scenery are severely limited. Howard Johnson, the regional forester, has informed us that 98.4 percent of all marketable timber (in the Tongass Forest) has been sold and will be harvested.

In attempting to document our contention that surely some small part of this magnificent country should remain a wilderness, we have discovered we are limited by our backgrounds. In our small community we have no scientists to give us answers to such questions as: What are the effects of clear-cut logging on steep hillsides, especially with reference to salmon-spawning streams? Do spruce seedlings really

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choke out older growth after clear-cut logging? What of the pH factor? In other words, we badly need some documented answers and references. Is there anyone who would be willing to help us? We will be glad to send any further information, including a copy of the wilderness proposal.

DEE LONGENBAUGH
Sitka Conservation Society,
Box 377, Sitka, Alaska 99835

Surmounting a Crisis

Harry A. Ackley’s letter (26 June) regarding events at the department of pediatrics of the University of California, San Francisco, needs clarification. On 7 May Governor Reagan requested that the university be closed until 11 May. The closing, plus events in Cambodia, Kent State, Augusta, and elsewhere stirred this campus as never before in its history. “Informal” faculty, staff, and student meetings were held continuously. All of the meetings were emotionally charged, and countless resolutions were passed. The entire campus community was searching for a rational response to what many perceived as a campus and national “crisis.” During the official closing, the pediatrics department met all of its patient-care responsibilities, and when the campus reopened, it met its responsibilities to students, patients, and research.

On 11 May when the Academic Senate was able to resume official meetings, it stated: “The current nationwide and University crisis makes normal conduct of courses difficult if not impossible and these circumstances place a special obligation on faculty members to insure that the educational and personal needs of students are protected.” Ackley stated later: “I have no knowledge as to whether research was interfered with or stopped during this period of time. Specifically my education was not interfered with; the University was officially closed 7 May through 10 May, and I was on vacation from 11 May through 25 May.”

These were trying days. The campus was not “taken over” for use as a “political machine.” The fact that patient-care responsibilities were met is an everlasting credit.

EDWIN F. ROSINSKI
Office of the Chancellor,
University of California Medical Center,
San Francisco 94122

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Section of human epidermis taken from a site of allergic eczematous contact dermatitis due to mercuric chloride. Parts of a Langerhans cell and of a keratinocyte are shown. Photographed at 6,000x in a Siemens Elmiskop 1 A electron microscope; enlarged to 16,000x with a Durst S-45EM.

(Courtesy of Dr. Inga Silberberg, New York University School of Medicine, Department of Dermatology).
there could be a shortage of low-
estrogen pills on the market,” Edwards

told the Fountain subcommittee.

The decision to expedite the review of
Demulen was made despite the fol-
lowing:

1) Several companies already had low-
estrogen pills on the market.

2) When Representative Benjamin
S. Rosenthal (D-N.Y.), a member of the
Fountain subcommittee, asked Edwards
"Is it your position that you are to
be guided in your priorities accord-
ing to market conditions and the avail-
ability of drugs?,” Edwards answered,"Absolutely not."

3) The New Drug Application, ac-
cording to Fountain’s subcommittee
staff members, did not adequately de-
monstrate the efficacy of the drug as
required by law.

After several hours of questioning by
the Fountain subcommittee, Henry
Simmons, director of the FDA’s Bu-
reau of Drugs, explained the problem
with Demulen and other similar cases,
which the agency faces. "We have a
difficulty here in being damned if we
do and damned if we don’t. If we try
to be logical about the regulations and
use good sense we get tripped up be-
cause we haven’t followed the letter of
the law,” he said.

Goldberg had a different view of the
case: “What we are dealing with here is
not hard science but the making of de-
cisions on the basis of hypotheses, with-
out the evidence required by law.”

The Demulen approval was not the
only instance of the new FDA efficien-
cy in speeding the process of getting a
new drug on the market. The approval
of L-dopa, which is used in treating
Parkinson’s disease, came after Edwards
characterized as "an extraordinary ef-
fort by the FDA to make the drug avail-
able as quickly as possible." In
announcing its approval, Edwards noted
that clinical tests showed that one-third
of the patients treated with L-dopa did
no respond favorably and that there was
a high incidence of side effects. Also

cited by the commissioner was the lack
of information on the long-term effects
of L-dopa. Because of these considera-
tions, the FDA required the drug’s manu-
facturer to continue clinical test-
ing of the drug while it is on the mar-
et, an unprecedented requirement by
the FDA. According to Simmons, the
agency would not in the past have ap-
proved the drug until the completion of
long-term clinical studies.

Yet while the FDA’s new efficiency
has speeded up the process of approving
new drugs for marketing, it has not
appreciably expedited the removal of
ineffective drugs from the market. For
example, the agency has, to date, pub-
lished only about one-third of the Na-
tional Academy of Sciences–National
Research Council study of the safety
and efficacy of all drugs on the mar-
et. This study, undertaken to imple-
ment the Kefauver-Harris Drug Act,
was completed in 1968. Edwards has
promised that all the findings will be
made public by the end of this fiscal
year and blames the delay on the need
to formulate guidelines for relabeling
and other changes which the FDA says
must accompany the release of the
findings, but which the overburdened
FDA staff has not yet found the time to
compile.

Lawsuit to Compel Release

The commissioner’s promises and
explanations do not carry much weight
with FDA critics. Robert McCleery,
for example, a former chief of the
Medical Advertising section of the
FDA’s Bureau of Medicine and now a
consultant to Nader’s Center for the
Study of Responsive Law, believes that
economic considerations have played
a part in delaying the release of the
NAS-NRC reports. He helped initiate
a recent lawsuit to obtain immediate re-
lease of all the reports.

FDA officials deny that economic
considerations play any part in their
operations and insist that their only
criterion in making decisions is the
safety and efficacy of drugs.

Yet the drug industry, which is one
that has consistently enjoyed high prof-
ts, is certainly given ample opportunity
to collaborate with and influence FDA
decisions. When an NDA is submitted
to the FDA, the manufacturer is ad-
vised which FDA official will review the
case and is permitted to meet continu-
ally with that official to answer any
questions and allay any doubts he may
have. When this reporter tried to find
out the names of the officers who re-
viewed the Demulen evidence, how-
ever, he was informed by Simmons
that such information is not normally
made public.

In opposing FDA decisions the drug
industry is also a powerful force, often
employing legal delaying tactics to force
long intervals between an FDA ruling
against an ineffective drug and the ac-
tual removal of the drug from the
market (Science, 29 August 1969).

FDA critics accuse the agency of in-
viting such proceedings and delays by
failing to declare ineffective drugs “im-
minent hazards to public health.” Such
a labeling would eliminate the court
proceedings and force the drug off the
market immediately. The FDA claims
that it cannot evoke the ruling against
drugs which are merely ineffective, but
FDA critics contend that ineffective
drugs can be hazardous because a pa-
tient can be jeopardized by an ineffec-
tive drug. “Apparently people have to
be dropping like flies all over the coun-
try before the FDA will employ the
imminent hazard procedure,” McCleery
said.

Under the new management, then,
criticism of the FDA has not appreci-
ably decreased. In addition the agen-
cy’s financial outlook remains bleak.
Edges has asked Congress for a sub-
stantial increase in the FDA budget for
fiscal year 1972. The increase would
more than double the FDA budget, bring-
ing it to $150 million from its current
$72-million level. A belt-tight-
ening administration, however, has been
reluctant to back Edwards fully in his
request, and it appears unlikely that
Congress will grant more than a small
increase.

Thus while the new-look FDA has
speeded the approval of new drugs for
marketing and reduced criticism from
industry, many of its basic problems
remain to be solved, and criticism from
Congress and consumer groups has, if
anything, increased. Edwards still has
a long way to go before he convinces
these critics that the FDA’s new-found
efficiency is not more in the interest of
the drug industry than in the interest of
the public—THOMAS P. SOUTHWICK

APPOINTMENTS

W. J. Tietz, chairman, physiology and
biophysics department, Colorado State
University, to vice president of student
and university relations at the univer-
sity. . . . Roger F. Palmer, director,
clinical pharmacology division, depart-
ment of medicine, University of Miami
School of Medicine, to chairman, phar-
macology department in the school. . . .
Lionel E. Mawdesley-Thomas, director
of pathology, Huntington Research
Centre, England, to director of research
at the centre. . . . Victor H. Hutchinson,
professor of zoology and director, Insti-
tute of Environmental Biology, Univer-
sity of Rhode Island, Kingston, to
chairman, zoology department, Uni-
versity of Oklahoma.
It is this gap in the literature that John Brandt's book fills with notable success. Intended as an intermediate-level reference text, the book provides a comprehensive but highly readable account of the evolution of present-day ideas about the interplanetary medium and its relation to solar activity. The treatment is self-contained, requiring little or no prior knowledge of interplanetary physics. Pertinent supplementary references are listed after each chapter.

I found one of the most rewarding parts of the book to be the opening chapter, in which Brandt traces the history of early thoughts and theories of the interplanetary medium. In my opinion, even most experts in the field of space physics would benefit from reading this brief account of little-known facts.

The obvious place to begin a discussion of the solar wind is at the sun, and the author sets the stage by summarizing current knowledge of classical solar physics. Probably all of the material in chapter 2 is relevant to understanding the origin of the solar wind. Upon completing the book, however, I am left with the impression that little reference is actually made to it in subsequent chapters. This is not so much a fault of the book as it is a reflection of our present lack of understanding of the relation of observed solar wind properties to visible features on the sun (a point which, however, Brandt might well have stressed).

Topically, the chapter devoted to basic theory is complete and up to date. Brandt has succeeded in extracting the important physics from many theoretical analyses and presenting it in a concise manner. Occasionally, completeness of argument has been sacrificed for the sake of brevity, which is an unfortunate situation. I was particularly dissatisfied with the section on subsonic versus supersonic solar wind solutions, a topic of such colorful controversy in the technical journals. Brandt's discussion of the subject leaves me unconvinced (apart from observational evidence) that the supersonic solution is the only physically acceptable one.

In the chapters dealing with observations, the author presents representative facts and figures about the average properties of the solar wind and describes in some detail the experimental techniques by which they are obtained. At the same time, he impresses upon the reader the importance of fluctuations of these properties. An important research problem in the future of solar wind physics will be to relate these fluctuations to the evolution of specific coronal features.

As with any technical book written by an active worker in the field, the book under review shows some tendency to overemphasize the author's own contributions to the subject. I found this to be true especially in the lengthy discussion of ionic comet tails in chapter 4.

Introduction to the Solar Wind is basically an excellent, well-organized text. It correctly delineates the most important aspects of modern solar wind research. In the style with which it was written, the book should appeal to readers with a wide variety of technical backgrounds. Each reader, however, expects something different of a book. For instance, I would have liked to see greatly expanded the final chapter, dealing with the impact of the existence of the solar wind on classical astrophysics. Without enlarging the book significantly, this might have been done by condensing the review of solar physics in chapter 2. Certainly new ideas and directions for future research are stimulated by discussions of the type encountered all too briefly in the last 15 pages of the book.

ROGER A. KOPP

High Altitude Observatory,
National Center for Atmospheric Research, Boulder, Colorado

Books Received


(Continued on page 1246)
The Solution To Oxygen Uptake & Evolution

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In another experimental use cell dispersion with collagenase enabled Carlton Blackwood (Columbia University) to successively transplant an ovarian papillary serous cystadenocarcinoma of human origin beyond 40 transfer generations in rats and hamsters. Without collagenase, increasing amounts of connective tissue accumulated between tumor nodules; and serial transplants could not be carried out beyond three or four transfer generations. Removal of the collagen rendered the tumor transplantable indefinitely.

Leonard Shulman and his associates (Harvard) treated tooth allografts with bacterial collagenase prior to transplantation. This procedure dissolved the collagen fibers in the periodontal ligament and thus prevented early rejection caused by the immunogenicity of the periodontum without damaging the tooth cement. When a tooth is transplanted within the same mouth it reattaches to alveolar bone within 3 weeks and survives indefinitely; but tooth transplants between individuals do not reattach normally and are ultimately lost because of root resorption. It was demonstrated that, in the absence of prior treatment with enzyme, at 3 weeks there is extensive lymphoid infiltration leading to rejection of the foreign periodontal ligament. Comparison of control allografts and enzyme-treated allografts in rhesus monkeys after 3½ months showed that enzymolysis of the periodontal ligament before transplantation significantly reduced inflammation after transplantation and increased ankylosis leading to prolonged survival of the tooth allograft.

Two other applications of collagenase of great potential use to human patients were reported, though as yet both are restricted to experimental animals. Bernard Sussman (Howard University) used bacterial collagenase to dissolve the protruding cartilage which, through compression of the nerve root, causes severe pain in herniation of the intervertebral disk, the condition commonly referred to as slipped disk. This non-surgical decompression of the nerve root is possible because of the selective enzymatic dissolution of the disk which assures a margin of safety not shared by common proteolytic enzymes. Sterile collagenase was injected directly into the nucleus pulposus of dogs. The cartilage was dissolved without any damage to the surrounding tissue. All dogs walked immediately after recovery from anesthesia and showed no evidence of dysfunction of any sort. Preliminary trials in vitro against tissues removed from human patients in the operating room or at autopsy showed similar favorable action. Collagenase mediated complete destruction of the nucleus pulposus and major dissolution of the fibrocartilage, the tissues that constitute the bulk of the offending mass in clinical disk herniation while hyaline cartilage is usually spared and osseous effects are insignificant.

Dogs were used by Frank Longo and John Lattimer (Columbia) in their evaluation of collagenase as an adjunct in cryoprostatectomy. With increasing life expectancy, more poor-risk patients unsuitable for conventional surgery present themselves with obstruction of the bladder caused by benign or malignant enlargement of the prostate gland. Cryoprostatectomy—which is fast, requires no or little anesthesia, and results in negligible blood loss or trauma—has many advantages for patients of advanced age. In this otherwise highly successful procedure, the single most frustrating complication has been the retention of slough which plugs up urinary passages and prevents elimination. Direct injection of collagenase into the prostate glands of 15 dogs before the cryoprobe was put in place gave the desired result of removing the slough and retaining normal urinary function without producing demonstrable histologic damage to vital tissues. In addition, several commercially available enzymes were tested for the purpose of degrading or decomposing “cryoslough” from patients after cryoprostatectomy. Collagenase was significantly superior to the other agents tested. In a concentration of 0.1 percent total dissolution was accomplished in 18 hours.

In the clinical sessions, good therapeutic effects were reported in more than 1500 patients who were given topical applications of bacterial collagenase in an ointment base for debridement of second- and third-degree burns prior to skin grafting and for the treatment of dermal ulcers. Ingo Mazurek (Knoll A.G.) summarized results

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