

Dr. Latham, in order to read deeper down, wants to make a bigger tremor.

He and the National Aeronautics and Space Administration are now discussing the possibility of crashing the ascent stage of the Apollo 12 lunar module into the moon, once it has safely carried the astronauts up to the command module waiting in orbit. The resulting impact, about 18 miles from the seismometer that the crew will leave on the surface, would provide a shock that ought to sound out the moon at least six miles down.

"It would be an extremely valuable experiment," Dr. Latham says, adding that the seismologists are learning the lunar module's weight, fuel vent rates and other characteristics in detail to get the most from the crash. "I suspect that we're going to know better than the Grumman engineers (who build it) what the LM does."

Next summer, Apollo 14 is scheduled to carry an active seismometer that will automatically throw out hand grenades to create its own shocks, but these too will be small ones, good only for about a mile down. More useful will be the network of passive seismometers that will have evolved after several Apollo moon landings. Triangulation from widely spaced sites should make it possible to track tremors at great depths.

**Also planning ahead** is Dr. Carroll Alley of the University of Maryland, mentor of the laser reflector that has been left on the moon for a variety of measurements, including the earth-moon distance with an accuracy of six inches.

The device has already shown that its mirrors can survive the extreme temperature changes from lunar night to lunar day without crippling distortion, and Dr. Alley is now negotiating with NASA about sending additional reflectors on Apollos 16 and 17.

A reflector near each edge of the moon's visible face, together with one near one of the poles, could enable extremely accurate measurements of the moon's librations, Dr. Alley says, as well as providing reference points for lunar mapping. ◇

## ORACLES NEEDED

### For technology assessment

Television was once regarded as having no future, an atomic bomb was dismissed as ridiculous, Alaska was written off as folly and the airplane was either ruled out as a freight carrier or just ruled out period.

There are many more examples of where some oracle who, in retrospect, should have known better, got his visions mixed. And in retrospect, some miscast forecasts might seem amusing.

But a growing number of people believe the world can't afford to make more technological forecasting errors. They point to air and water pollution, riots, power shortages, jammed cities and highways and social alienation as some of the consequences of not foreseeing or foreseeing inaccurately.

**As of now there** are professional seers who make it their business to foresee technological possibilities. But last week the National Academy of Sciences entered the lists on the negative side. It issued a report urging that the Government get into the business of forestalling some of technology's side effects.

The report, prepared by a 17-member panel chaired by Dr. Harvey Brooks, dean of engineering and applied physics at Harvard University, comes three years after a proposal by the House Subcommittee on Science, Research and Development of a Federal early warning system to spot the dangers of technology (SN: 10/29/66, p. 345). The new report sees technology assessment, the term for technological forecasting, as important enough to warrant both Presidential and Congressional attention.

The report recommends that the assessment function be carried out by the Office of Science and Technology, either as a separate Technology Assessment Department within OST or distributed within an expanded OST along other lines. This would be better than a separate commission or board along the lines of the Council of Economic Advisors, since the assessment question would inevitably be tied up with other science-policy issues which are dealt with in OST, says the report.

**The new Government** operation, regardless of its organization in the executive branch, would also have roots in both Houses of Congress, either as a Joint Committee on Technology Assessment or a Technology Assessment Office serving Congress as a whole.

Although acknowledging the positive contributions of technology, the report admittedly concentrates on the negative, worrying not so much about what good technology can do but how to prevent it from doing harm.

As justification for the entry of the Government into technology assessment, the report notes that, "By the mid-20th century, largely as a result of the massive Federal support of research and development stimulated by World War II, Government policy had become at least as influential as the forces of the ordinary market in setting the environment for technological change. Today the Government finances nearly 50 percent of industrial research and development and virtually every Government agency is involved in one or more programs designed to further

the development and use of some technology by providing an outlet for its goods and services, or by stimulating it at its inception, or both."

Rep. Emilio Q. Daddario (D.-Conn.), chairman of the Subcommittee on Science, Research and Development, who requested the report, says his subcommittee will hold hearings to follow up the panel's recommendations.

"**I am certain** that this straightforward and lucid report will also result in concrete action," he says. "The report shows that Congress needs the capability for independent, objective analysis of all the potentials of new technology, a capability which does not now exist. While technology assessment is a very complicated affair involving many invested interests, it can be accomplished. Congress must make sure it is."

One area the panel admits it has not covered adequately is military technology. Although not passing judgment on it, the report points out that the military's policy of keeping information secret conflicts directly with technology assessment, which must have correct and adequate information if it is to work.

## PSYCHOLOGISTS MEET

### Relevance in Washington

Professional meetings have repeatedly been hit hard by the demands of activists both within and without the ranks of their organizations. In May of this year it was the National Conference on Social Welfare (SN: 6/7, p. 549) and in July it was the American Medical Association meeting (SN: 7/26, p. 76). This week the 77th annual meeting of the American Psychological Association in Washington, D.C., was the target of protest and dissatisfaction.

The psychologists had made a determined effort in the direction of relevance; fully half of their sessions were devoted to pressing social issues. But it wasn't enough.

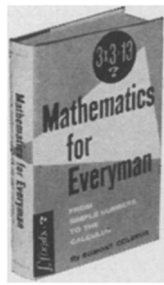
The meeting began Sunday, and the public disturbances began Monday when a small group of radicals, many of them sporting red arm bands, comprising two newly organized and loosely knit organizations—Psychologists for Social Action and Psychologists for a Democratic Society—took over a session on student unrest.

**They demanded that** the APA change its political orientation and get research money for really pressing problems of society. Dr. Bertram Garstoff, a radical psychologist with capital city's experimental Federal City College, told his colleagues that slowly trying to change people's attitudes isn't going to help; action is necessary.

september 6, 1969/vol. 96/science news/177

# Math "Bug" You? —No Problem!

From Simple Numbers to Calculus



Now comes a new and completely different kind of self-teaching math "course"—one that yields truly amazing results!

"The author assumes no previous acquaintance with mathematics . . . He advances the reader to some mathematical notions of 'college' level . . . The near-miracle is accomplished by patient, carefully-phrased exposition and by building the discussion step-by-step . . . The book is intended for study without the aid of a

teacher."—**New Technical Books** (of the New York Public Library).

If you have despaired of ever "licking" mathematics, if lack of mathematical knowhow is holding you back, if you have tried other methods and found they simply did nothing for you, then perhaps you would wish to try the remarkable Colerus method. It is **guaranteed** to satisfy your expectations, or full purchase price refunded. Not a tutored math course that stands you anywhere from \$150 to \$300, but a self-instruction manual that costs a mere \$4.95—**if you decide to keep it.** **ORDER NOW!**

## MATHEMATICS FOR EVERYMAN

by Egmont Colerus

\$4.95 Postfree • 10-Day Money-Back Guarantee

**EMERSON BOOKS, Inc., Dept. 296-S**  
251 West 19th Street, New York 10011



## The Golf Secret

By H. A. Murray. Your left shoulder makes the amazing difference! Sweeping, utterly different study of the golf swing. Startling discovery by a medical doctor, based on anatomy. Drops golf scores far, fast. Fully illustrated. Order this remarkable book now! Only \$4.95 Postfree. Money-Back Guarantee.

**EMERSON BOOKS, Inc., Dept. 294-S**  
251 West 19th Street, New York, N.Y. 10011

## How To Argue and Win

Here is a clear, simply written basic guide to logical thinking, that shows how to spot the fallacies, the prejudices and emotionalism, the inappropriate analogies, etc., in the other fellow's argument and how to watch for and avoid the irrational in your own judgments. The author makes plain not only how but also why people resist facing the truth.

**ART OF ARGUMENT**—by Giles St. Aubyn  
\$4.95 postfree • 10-Day Money Back Guarantee  
**EMERSON BOOKS, Inc., Dept. 295-S**  
251 West 19 Street, New York, N.Y. 10011



Easily assembled kit of parts for making a 36" high 500,000 volt electrostatic generator. All parts included except wood base and motor. (Any 1/8 HP motor will suffice.)

**200,000 VOLTS.** Kit \$26.50 postpaid. Fully assembled \$39.50 postpaid. 17" high. Diam. 7". Current 1.5 to 2.5 microamps. 90% rel. humidity range.

Experiments in Electrostatics—a book with experiments you can do . . . send 50¢. Low priced physics equipment for schools and science projects. Free catalogs—send 15¢ for postage.

## MORRIS and LEE

Dept. SN9A69  
1685 Elmwood Ave., Buffalo, N.Y. 14207

The session was one of five special symposia dealing with the convention theme, "Psychology and the Problems of Society."

"We are using this year's convention of the American Psychological Association to examine and restructure the priorities of professional psychology," explained Drs. Jack Sawyer of Northwestern University and Howard Gruber of Rutgers University, co-chairmen of the committee on Psychology for Social Action.

Nonetheless, the dissidents followed their orderly take-over with a list of demands presented Tuesday to the APA council of representatives. They asked that the APA council:

- Endorse a resolution to end the war in Vietnam.
- Investigate discriminatory policies in accredited universities.
- Establish an investigating committee to determine whether the activities of the association's Division of Military Psychology are consistent with the objectives of APA.

The psychologists and students making up the social action groups were not the only ones presenting demands. The Black Student Psychological Association also asked for action. It requested funds to implement programs of larger black student recruitment in the field of psychology, development of realistic criteria for hiring black faculty, and centralization of scholarship funds. The APA council endorsed the black student demands, approved funds for a study preliminary to implementation, and postponed action on the social activists' demands until October, when the psychological association meets again in Washington.

**Agreement with** the objectives of the dissident psychologists and students and desires for general reordering of priorities in the behavioral science field were voiced not only by the small radical groups but by a substantial number of

sympathizers, many of them highly recognized professionals.

"Established forms for conducting meetings and dealing with authorities are no longer observed," Dr. Timothy W. Costello, New York City Deputy Mayor, told the American Board of Professional Psychology. "These are disconcerting changes for the older, more staid members of the establishment, but when properly understood they have a compelling logic about them," he said.

Dr. Kenneth E. Clark of the University of Rochester, who was the original chairman of the Symposium on Student Unrest, sympathized with the young insurgent groups, but said he would also like to see a greater representation of more moderate students protesting. "You have to notice the intensity of these young people and listen to them," he said. "They can't be ignored."

**He gave** the radicals 45 minutes to speak, saying that many of the psychologists had not been exposed to this before. There was the expectation, said Dr. Clark, that many of the 10,000 attending psychologists would be disappointed with the papers presented throughout the five-day convention.

This disappointment was with the failure of the papers to fulfill their intent and come to grips with the problems of society. According to a large number of outspoken psychologists, that is the active step that must be taken.

"We must," said Dr. George A. Miller, president of the APA, "somehow incorporate our hard-won knowledge more effectively into the vast social changes that we all know are coming—that must come if our nation and other nations are to survive and flourish."

Although psychologists have not been aloof or insensitive to the problems of society, said Dr. Miller. "I cannot escape the impression that we have been less effective than we might have been."

## ENVIRONMENTAL QUALITY

### Using what's in hand

Everyone talks about the condition of the environment but too few do anything about it. This week the American Chemical Society's Committee on Chemistry and Public Affairs issued a report which stands as a comprehensive outline for action on air and water pollution, solid waste disposal and pesticides.

No scientific and technological miracles should be expected or waited for in the battle against environmental degradation, the ACS report emphasizes.

Instead, its 73 recommendations concentrate on ways to make better use of existing science and technology.

"This country can take enormous strides, now, toward a cleaner environment. The crucial requirement is that sufficient energy and support be devoted to the task," says the report.

#### Among proposed actions:

- More stringent Federal standards on automotive emissions.
- Regional inventories of pollutants from all sources.
- Stepped-up work on advanced, low-polluting power systems.
- More scientific involvement in research on sewage treatment.
- Emphasis on recycling of solid materials. ◇