Once More with Feeling

No matter how one may regard the general content of commercial television, this medium does have one important lesson for educational television. The lesson is that the use of a videotape recorder is the simplest way to improve the quality of a performance, whatever the subject matter. Immediately upon the completion of a scene, the 2-inch wide tape, carrying both picture and sound, can be played back on the instrument and, if necessary, the tape erased and the scene done over. No time-consuming development process is necessary before the performance can be viewed. The drawback to the use of videotape recorders in educational TV is that they are as hard on the pocketbook as they are easy to operate. An instrument costs in the neighborhood of $50,000.

Last month the Ford Foundation eliminated this drawback by giving $2.7 million to the National Educational Television and Radio Center, located in New York City. The Center will equip with recorders most of its 43 affiliated stations now on the air throughout the country. The Center will also supply stations with tape for the first year of operation and will purchase for its own use machines for copying outstanding programs.

In the two years the new invention has been in use commercially, it has demonstrated advantages over both filmed and live shows which should apply equally well to educational TV. Besides the advantage of improving performance by making possible immediate editing, tape has all the flexibility in programming of film together with the high fidelity of a live show. As with film, programs can be recorded at hours to suit the convenience of performers and studio workers and then presented on the air at hours to suit the convenience of viewers. And, like film, tapes can be reproduced rapidly or stored indefinitely. But where with film the process of development and projection means some loss in light values and detail, a taped show is practically indistinguishable from a live show.

Up till now, a lecturer in educational TV might spend hours studying notes and preparing demonstrations, and then make a single live appearance, with the show possibly being recorded for reruns on a low-fidelity film device. How much better the opportunity for developing the viewing side of television if the lecturer spends some of this time in actual presentation and editing. He could try a demonstration, watch it on the monitoring screen, and then do it again with improvements. In demonstrating centrifugal force, for example, he might choose to do again the bit where he twirls a pile of water about his head, but this time faster.

We have been more enthusiastic in the past about the use of private and government funds for the support of research than for the procurement of hardware, but we are glad on this occasion to reverse the familiar stand. To be sure, good research in educational TV is needed, for according to some observers, much of present research is not tapping any real variables, except that groups of students with TV teachers are compared with groups without such teachers. Good research is needed, but the time is also ripe for a substantial investment in hardware. By underwriting the cost of videotape recorders, the Ford Foundation has taken a step that should result in an immediate and general improvement in the effectiveness of educational TV.—J.T.
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Letters

Ashkenazic Jews

The article by P. H. Saldanha and W. Beçak, "Taste thresholds for phenylthio-urea among Ashkenazic Jews" [Science 129, 150 (1959)] is a good presentation of data relating to thresholds and correlated information. The data obtained appear to be highly selective insofar as the groups discussed are concerned. The comparison is poor, since the Danish and English groups representing Europeans (Caucasian race) are in no way related.

The Jews were not permitted in the Scandinavian countries until 1904; they were in England for approximately 200 years, were expelled in the 12th century, and were later readmitted in the 18th century. This may appear to justify the comparisons.

Historical facts exist to show that the Polish Jews did intermarry with their neighbors and did change their faith to intermarry later. Strong evidence in support of these facts may be found by examining heraldic symbols of the Polish nobility. A closer relation can be found between the German Ashkenazic Jews and the German people, since intermarriage occurred more frequently.

The specific problem of racial difference or similarity, which occupied the German racial theorists from 1933 to 1945, may be indicated by a comparison of the neighbors of the Ashkenazic Jews, as well as by comparisons with the Chinese and Japanese (Mongoloid race). This still leaves unanswered the question of the relation of the Mediterranean peoples (Spanish, Italian, and Greek) to the Jews.

Howard G. Lasser

Vienna, Virginia

The comments by Lasser are in accordance with my own views of the problem of Jewish relationships with Europeans as far as I have understood Lasser's criticisms. I think Jewish intermarriage with European people has varied to a great extent according to the country considered. Available historical data could indicate that Ashkenazic Jews from Central Europe (including the Polish ones) have received appreciable genetic contributions from Europeans other than Mediterranean, but the invasions of Europe by Mongols [see Carleton S. Coon, The Races of Europe (Macmillan, New York, 1939)] at several times (especially the Tartar invasion in the 7th century, when the upper class of a khazar group was converted to Judaism) could have injected some admixture into Western Jewish communities (mainly into those from Poland and Russia). Since there are no available data on taste ability to PTC obtained by the same technique among non-Jews from Poland, it appears reasonable to me to compare Polish Jews with English and Danish peoples who could represent typical non-Mediterranean Europeans, in order to know how great the Jews depart from the latter. Moreover, as is pointed out in the article, the relationship of Ashkenazic Jews to Negro groups on the grounds of Rh blood type (see Mourant; see references in the article) must be considered too. Efforts will be made to collect data on other Jewish groups elsewhere.

P. H. Saldanha
Faculty of Philosophy, Science, and Letters, University of São Paulo, São Paulo, Brazil

The Green Ray

In his review of O'Connell's The Green Flash and Other Low Sun Phenomena [Science 129, 1218 (1959)], Charles H. Smiley bemoans the fact that hardly anybody knows of the existence of the green ray. This is not true. Any red-blooded youngster of a generation ago has read Jules Verne's The Green Ray (which is listed in O'Connell's bibliography). Scottish belief has it that only one who has seen this phenomenon knows whom he or she truly loves, and Verne's heroine, a capricious lady of Edinburgh, refuses to marry until she has beheld it. All concerned set out on an expedition to the island of Staffa, famous for Fingal's cave. Eventually everyone sees the green ray except the lady and her lover, who are busy looking into each other's eyes.

My own search for the green ray, which has led me, too, to the island of Staffa, has been fruitless (nevertheless, I married). The green ray can be seen only when one views the horizon from an elevation, and this—plus factors of latitude, season, and weather—probably explains why few sea captains are familiar with it.

Gerhart S. Schwarz
Presbyterian Hospital, New York, New York

Response in Nervous Tissue

In his excellent article "Neuron doctrine and electrophysiology" [Science 129, 997 (1959)], T. H. Bullock surprisingly does not refer to Bishop's earlier summary and conjectures on nerve physiology [G. H. Bishop, Physiol. Rev. 36, 376 (1956)]. Much of Bullock's thesis was proposed by Bishop as a unitary concept for the seemingly paradoxical evidence for both graded response and all-or-none response in nervous tissue. Bishop's major points were: (i) that the all-or-none response is a special case of the general property of excitability; (ii)
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The General Program of the 126th Meeting of the AAAS in Chicago, 26–31 Dec., 1959, will be available to you within the first week in December—whether you can attend the Meeting or not. Effective this year, the former General Program-Directory, which had become an unwieldy book of more than 400 pages, has been separated into two publications, namely:

a) The Directory of AAAS Officers and Activities, 96 pp., already published; and
b) The General Program of the Annual Meeting, c. 200 pp., which will appear early in December.

Both of these, sold at cost, may be purchased separately—in advance (see coupon below), or at the meeting. Some of their respective contents are:

The General Program

1. The two-session general symposium, “Moving Frontiers of Science IV,” arranged by the Committee on AAAS Meetings.
2. Programs of the 18 AAAS sections (symposia and contributed papers).
3. Programs of the more than 70 participating societies.
5. The Special Sessions: AAAS Address and Reception, National Geographic Society, Phi Beta Kappa, Sigma Xi, RESA, Tau Beta Pi Association.
6. Details of the Morrison Hotel—center of the Meeting—and of the other session sites.
7. Titles of the latest foreign and domestic scientific films to be shown in the AAAS Science Theatre.
8. Exhibitors in the 1959 Annual Exposition of Science and Industry and descriptions of their exhibits.

The Directory

1. AAAS officers, staff, committees for 1959.
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3. The 285 affiliated organizations.
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that all-or-none conduction was developed chiefly under the necessity of action over distances in organisms whose parts became separated by reason of size and complexity and where graded response and consequent decremental conduction would be inadequate for central-nervous-system control of peripheral organs; and (iii) that the chief characteristic function of nervous and other excitable tissues is performed by means of graded responses.

LAWRENCE R. PINNEO
Allan Memorial Institute of Psychiatry, McGill University, Montreal, Canada

Meetings

Southwestern and Rocky Mountain Division

The Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science held its 35th annual meetings in Laramie, Wyo., 5–9 May 1959. Most of the sessions were conducted jointly with those of the 30th annual meetings of the Colorado-Wyoming Academy of Science.

Featured sessions at the meetings included an address by Chauncey D. Leake, president-elect of the AAAS, on “Standards of measurement and nursery rhymes”; a report on the activities of the association by Paul D. Klopfsteg, president; and an invited paper, “Physical constants as standards of measurement,” by A. G. McNish of the National Bureau of Standards.

Programs of the sections of the division and of the Colorado-Wyoming Academy of Science included 137 individual papers. Two symposia consisting of invited papers were conducted. One of these, sponsored by the division’s committee on desert and arid zones research, was presented by eight specialists in the fields of agriculture, on the subject “Agricultural problems in arid and semi-arid environments.” At the fourth in a series of symposia on improvement of science teaching, some problems of college teaching were discussed. After a stimulating talk on “Graduate training for the college science teacher,” by Robert H. Bruce, dean of the Graduate School of the University of Wyoming, discussion groups, divided according to scientific discipline, considered their special problems.

On the final day of the meetings a large group of members of the Colorado-Wyoming Junior Academy of Science attended sessions featuring a chalk talk on the evolution of the Rocky Mountain area, by Samuel H. Knight of the University of Wyoming, and presentation of student papers.

The division’s annual John Wesley Powell memorial lecture was presented by Hershel K. Mitchell, professor of biology of the California Institute of Technology, who spoke on “A perspective of biochemical genetics.”

Retiring divisional president Albert R. Mead, professor of zoology of the University of Arizona, delivered the presidential address, on “Science and extremism.”

The newly elected officers of the division include Lora M. Shields (New Mexico Highlands University), president; Alan T. Wager (Arizona State University), president-elect; and Earl D. Camp (Texas Technological College), member of the executive committee. Marlowe G. Anderson (New Mexico State University) will continue as executive secretary-treasurer and council representative.

Sul Ross State College at Alpine, Texas, was chosen as the site of the 1960 meetings, and an invitation from Arizona State University to hold the 1961 meeting in Tempe, Arizona, was accepted.

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Forthcoming Events

August

30–3. American Inst. of Biological Sciences, annual, University Park, Pa. (H. T. Cox, AIBS, 2000 P St., NW, Washington 6.)

30–4. American Cong. of Physical Medicine and Rehabilitation, Minneapolis, Minn. (Miss D. C. Augustin, 30 N. Michigan Ave., Chicago 2, Ill.)

30–4. Laurentian Hormone Conf., Mont Tremblant, Quebec, Canada. (G. Pincus, 222 Maple Ave., Shrewsbury, Mass.)


30–5. World Federation for Mental Health, 12th annual, Barcelona, Spain. (Miss E. M. Thornton, Secretary-General, WFMH, 19, Manchester St., London W.1, England.)

30–6. History of Science, 9th intern. cong., Barcelona and Madrid, Spain. (J. Vernet, via Layetona 141, Barcelona.)

30–6. Residues on Crops and/or the Problem of Insect Resistance to Insecticides, symp., Munich, Germany. (R. Morf, Secretary-General, IUPAC, c/o Sandor S. A., Basel, Switzerland.)


31–3. Biological Photographic Assoc., Montreal, Canada. (Miss J. H. Waters, P.O. Box 1668, Grand Central Station, New York 17.)

31–3. Mathematical Assoc. of America, 40th summer meeting, Salt Lake City, Utah. (H. M. Gehman, MAA, Univ. of Buffalo, Buffalo 14, N.Y.)

31–4. Haematin Enzymes, symp. (by invitation), Canberra, Australia. (A. H. Ennar, John Curtin School of Medical Research, Australian National Univ., Canberra.)

September


1–7. History and Philosophy of Science (General Assembly, History Div., Intern. Union of the History and Philosophy of Science), Barcelona, Spain. (R. Tatton, IUHPS, 64, rue Gay-Lussac, Paris 5e.)


1–7 Oct. International Civil Aviation Organization (Meteorological Div.), Montreal, Canada. (ICAO, Maison de l'Aviation Internationale, Montreal.)


2–5. American Mathematical Soc. and Mathematical Assoc. of America (joint summer), Salt Lake City, Utah. (E. Pitcher, AMS, Lehigh Univ., Bethlehem, Pa.)

2–8. Foundations of Mathematics: Infinitistic Methods, symp., Warsaw, Poland. (A. Mostowski, Dept. of Mathematics, Univ. of California, Berkeley 4.)

(See issue of 19 June for comprehensive list)
New Products

The information reported here is obtained from manufacturers and from other sources considered to be reliable, and it reflects the claims of the manufacturer or other source. Neither Science nor the writer assumes responsibility for the accuracy of the information. A coupon for use in making inquiries concerning the items listed appears on page 290.

- Volatiles Tester provides moisture or volatile-content readings with accuracy said to be ±0.05 percent. Operation is semiautomatic. Ten-gram samples are weighed in special pans and, after any given drying period, moisture percentage may be read directly. (C. W. Brabender Instruments Inc., Dept. 942)

- Tear Tester is designed to measure tearing strength of strongly directional materials that tend to tear at an angle. The tester holds the specimen rigidly throughout its entire length on both sides and directs the tearing force to produce a tear down the center line of the specimen. (Thwing-Albert Instrument Co., Dept. 943)

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- Tape Recorder for airborne application weighs 24 oz. Tape widths are ½ and 1 in., and seven tape speeds from 0.25 to 15 in./sec are provided. Wow and flutter are less than 1 percent under static conditions. Environmental operating ranges are: acceleration, 200 g; temperature, −50° to +200°F; relative humidity, 0 to 100 percent. (Leach Corp., Dept. 946)

- Inductance bridge measures inductance from 0.002 ph to 100 mh. Resolution of approximately ±0.01 percent and accuracy of the order of ±0.25 percent are claimed. For excitation, an internal oscillator provides signals of several frequencies between 1 and 100 kcy/sec. Detector and null indicator are also self-contained. Series resistance can be measured in the range 0.01 to 10,000 ohm. External oscillators and detectors may be used. (Boonton Electronics Corp., Dept. 947)

- Resistance-ratio recorders are designed to measure pressure, flow, and other variables detected by three-terminal, potentiometer-type transducers having total resistance between 1000 and 10,000 ohm. The ratio circuit uses the transducer as one-half of a Wheatstone bridge circuit and the measuring slide-wire of the recorder as the other half. Standardization is not necessary because

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This Model XV is adaptable to 10⁴ M determinations with the S-29315 Micro Range Extender.

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Current Ranges: 19, from .003 to 1.0 μA/mm.
Current Sensitivity: standard specifications, 10⁴ μA/mm.
Polarizing Ranges, volts:
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- +.5 to -5;
- 0 to -2;
- 2 to -4;
- 4 to -6;
Bridge Drive:
- Rotation time, 10 minutes.
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- Current axis, 250 mm; voltage axis, 10 inches equals one bridge revolution.

1/10%
⅒ %
synchronous, 1 inch per minute standard; other speeds optional.
10½ x 12½ inches; angle of slope, 30°.
manual against internal cadmium sulfate standard cell for both current and voltage.
RC, four stage.
ball point; Leroy type optional.
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2.5 millivolts, usable as general potentiometric recorder.
case, enameled steel; panels, anodized aluminum; writing plate, polished stainless steel; knobs and dials, chromium plated and buffed.
23 x 17 x 10.
65 pounds.
Catalog number S-29315 with accessories and supplies... $1585.00

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Letters

On Supplementing Human Faculties

It was hardly to have been predicted that when a human being is completely isolated from external stimuli, as was the case in an experiment conducted by the Office of Naval Research in 1956 [discussed at the Interdisciplinary Conference on Self-Organizing Systems, Chicago, May 1959], he loses his sense of orientation and cannot change a set idea in his mind. Rather one would have assumed that he could continue to meditate on past experiences, much as if he were sitting alone in the dark of a warm, silent cave. The question occurs: Can a person be thrown into a higher level of consciousness by supplementation of his faculties? Certainly the effect of faculty supplementation can be observed in ourselves to a mild degree when we are listening to music or sitting in a Cinerama theater. What would happen if we were complete coupling were achieved between a man and an artificial world, or between a person and more intense stimulation from his natural world?

This leads to another question: What faculties would have to be added to a monkey to make him react like a human being? For one thing, a monkey lacks the ability to formulate and recognize symbols. But he can learn a great deal. Conceivably, an electronic aid to symbol recognition or formulation might be provided for one of our simian friends, and he could be conditioned to use it, say, to recognize and indicate the letters of the alphabet. How much aid in grammar formulation and word categorization would we have to provide him (by means of a computer, perhaps) before he could begin to talk sensibly to us? Would this abe be less than that required by a computer operating alone?

The crux of the matter is undoubtedly in the coupling between external devices and animals. A device has to be more perfectly woven into our nervous system before we can begin to tap it as we naturally tap our other faculties. Also, some control, perhaps even a random control, must be provided, because if the extrasensory devices were not controllable they might assume the upper hand. Of course, in a movie we can shut our eyes, but more control would be necessary with extrasensory devices. If an electronic memory could be coupled into our brain we would have to some means of scanning it in order to get at arbitrary information.

Before coupling of any higher degree of sophistication than that achieved in a stereophonic Cinerama theater can be achieved, a more thorough understanding must be had of the coding of signals in the brain. Yet, if a person (or a monkey) were conditioned to substitute senses (as, for instance, if supersonic tones in a spectrum of frequencies were transduced into pinpricks along the spine) or coupled to a more perfect form of Cinerama, would he react normally under this greater degree of stimulation?

These speculations may perhaps seem fantastic, but in the light of the results of the Office of Naval Research experiment they must be given serious consideration.

Robert E. Mueller
Astro-Electronic Products Division,
Radio Corporation of America,
Princeton, New Jersey

Phosphorus and Phytoplankton

In the article "Bound phosphorus and growth of phytoplankton," by Whitford and Phillips [Science 129, 961 (1959)], the implication that phosphorus was not limiting because total phosphorus showed no correlation with phytoplankton pulses does not appear to be valid. Not only do the authors point out that total phosphorus varied with the rainfall but they acknowledge that the phytoplankton populations were low (and presumably, therefore, would require a relatively small amount of phosphorus). Also, and more significant, total phosphorus includes a galaxy of compounds, particulate and soluble, organic and inorganic, of which the only fraction now unequivocally known to be utilizable by algae is soluble orthophosphate. This fraction generally accounts for only about 10 percent of the total phosphorus in lakes, and even in the attempt to correlate this fraction with phytoplankton, the problem is complicated by the fact that certain plankton algae are known to be able to store up phosphate under conditions of plenty and to use this reserve for growth in times of phosphate deficiency. Therefore, any correlations observed between total phosphorus and phytoplankton are likely to be fortuitous, and any lack of correlation is likely to be without significance.

Joseph Shapiro
Department of Zoology,
University of Washington, Seattle

The criticism by Shapiro of our report is probably justified on the basis of data given. We believe, however, that our conclusions, which were based on data not adequately presented in the article, are valid. We are aware of the number and complexity of phosphorus compounds in natural aquatic habitats. Our analyses of total phosphorus were

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