Which comes first...the lightning or the rain?

The Visicorder Oscillograph directly records electrical charges in the atmosphere.

What effect do electrical charges on the atmosphere have on cloud formation? What causes cloud droplets to grow into raindrops? Why does one cloud produce rain while another does not?

These questions are being answered in part by a Model 1108 Honeywell Visicorder Oscillograph, shock mounted in a C45 Beechcraft, flown 15,000 feet over cloud formations above an electrically-charged airspace in Central Illinois.

The Illinois State Water Survey has scattered a network of 50 rain gages across about 400 square miles downwind from 30 miles of small stainless steel wire stretched in a grid-like pattern 30 ft. above the ground. Seven power supplies energize the wire to about 20,000 volts with each supply having an output of 1 to 3 milliamperes.

Timelapse sky cameras, radar, and other observatory equipment make records of electrical fields, wind speed and direction. A low-flying Piper traces the plume of electrical charge as it rises from the ground; the Visicorder at 15,000 feet measures the movement of the charge in the higher air, how and where it scatters or dissipates, and what effect it has on the growth of cloud droplets.

Maybe your research project is not as glamorous as these weather studies, but if it is at all complex, or requires high speeds or sensitivities, or if you need to record many parameters simultaneously—or directly—the amazingly versatile Visicorder can do your job.

The schematic diagram of these cloud studies will give you an idea of the many capacities of the Visicorder.

For more details about the Model 1108 (24 channels) and other Honeywell Visicorders, write Minneapolis-Honeywell, Heiland Division, 4800 E. Dry Creek Road, Denver 10, Colorado. Our DDD phone number is 303-794-4311.

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Honeywell

First in Control
Dr. Harold Edgerton had a fully developed positive and a negative just 20 seconds after he took this multiple exposure of a .22 caliber bullet cutting a single copper wire. He used his new F.G.&G Multiple Microflash unit with a Speed Graphic loaded with Polaroid P/n 4x5 film.
sufficient control of [pestilence and famine] so that they no longer effect-
ively govern his increase in number.” It is really absurd to think that man,
with all his ability, cannot govern his breeding if he wishes, that “biological
law” makes him multiply. He has for long ages been quite able to control his
numbers, though without certain refine-
ments now discovered. At a recent
meeting in the Toronto General Hos-
pital that was devoted to “new con-
cepts in fertility and dysfertility,” I
asked how many children a couple
might have. The physician who under-
took to answer the question said that
they might perhaps have a thousand
children. This is vastly short of the
200,000 ova and about 200 million
spermatozoa (per ejaculation) that
Dorn states are seemingly available.
But even this number will not be easily
achieved; it should not be considered to
pose a threat of overpopulation!

A. G. HUNTSMAN

Department of Zoology,
University of Toronto,
Toronto, Canada

References
1. N. E. Himes, Medical History of Contra-
2. C. M. Turnbull, The Forest People (Simon
3. E. Halley, Phil. Trans. Roy. Soc. London A17,
596, 654 (1693).
237, 1 (1945).

Studies on the
Metric System Proposal

I read with interest the editorial
“Weights and measures” in a recent
issue of Science [136, 1085 (1962)]. As
one who made a 2-year professional
study of the subject some decades back,
with a large staff of assistants, I ap-
preciate the objectivity in the pros and cons
you list. More could hardly be gotten
into a short editorial, and I do not pro-
opose to pursue the pros and cons much
further here. I should like to make
some comments in the interest of per-
spective, however, on the preamble, re-
buttal, and conclusion.

I feel sure it is just a slip (though it
may leave a wrong impression) when
you say “the question of adopting the
metric system in the United States is
again being debated” (italics mine).
Nearly 100 years ago (in 1866) the
metric system was legally adopted in
this country. The question today is rath-
er one of penalizing the use of our
thoroughly standardized English sys-
tem, thus destroying it, and substituting
the metric system as the sole system for
the United States.

In my study (in 1921) it was found
that, after nearly 60 years of legal
right, not more than one-tenth of 1
percent of the American people used
the metric units. Of the rest, relatively
few had even heard of this system, and
yet the 99.9 percent would be the peo-
ples to suffer and to be much more than
inconvenienced by a compulsory
change, whether it took 33 or 333
years. (The latter period is the more
likely if the experience of France is to
be used as a criterion.)

This is the other side of the “rebut-
tal”; and there is another question one
should raise in view of the fact that
the metric system is neither scientific
nor convenient except for fine-instru-
ment making and foreign trade: By
what kind of effort does one-tenth of
1 percent of our population keep on
insisting that it should benefit at the
expense of 99.9 percent of the people?
In Forbes magazine, beginning with
the issue of 19 January 1924, five articles
were published (three by proponents of
the proposal that the metric system be
made mandatory and two by me). The
following statement, in the 12 April
1924 issue, closed the series: “It is just
about as sensible to attempt to substi-
tute the metric for the English system
in the United States as it would be to
attempt to substitute in this country
the French for the English language.”

As for the conclusion, I should like
to point out that a very considerable
and objective study of the “facts” has
already been made on at least two oc-
casions, including the fact that there is
nothing scientific about the existing
metric system. The first study was made
in 1821 by John Quincy Adams. It was
this thoroughgoing analysis which Con-
gress had before it in adopting the Eng-
lish rather than the metric units for the
United States at that time. The second
study was made 100 years later, by me.
It was sponsored and financed by the
National Industrial Conference Board,
was published by the Century Com-
pany, went into every conceivable as-
pect of the subject, and was guided by
an able committee of five outstanding
American scientists, engineers, and
businessmen. Two favored the metric
system, two favored the English sys-
tem, and one (the chairman) was un-
committed. The report (261 pages) had
the unanimous approval of this com-
mittee, which was composed of E. M.
Herr, president of the Westinghouse
Electric and Manufacturing Company; Fred J. Miller, past president of the American Society of Mechanical Engineers; Henry D. Sharpe, treasurer of Brown and Sharpe Manufacturing Company; Henry R. Towne, chairman of the board of Yale and Towne Manufacturing Company (1); and Frank O. Wells, president of Greenfield Tap and Die Company.

Another study may of course be in order at this time. If it takes up where these two definitive analyses and the five Forbes articles left off, if some means is devised to make certain that it is unbiased and objective (not left entirely in the hands of the Bureau of Standards), and if, in addition, it goes into the lobbying and propaganda activities that lie behind the perennial agitation for making the metric system mandatory in the United States, a useful purpose may be served. But it surely should not cost the American taxpayers $500,000.

Joseph Mayer

929 Chestnut Lane,
Oxford, Ohio

Note
1. Writing to Henry P. Fowler, president of the U.S. Chamber of Commerce, on 27 July 1921, Towne designated the 1921 report, which is entitled "The Metric versus the English System of Weights and Measures," as "the most comprehensive and complete presentation . . . since the notable report of John Quincy Adams in 1821 . . . a veritable mine of information for those who are interested in this subject."

Early Comments on the Moon Illusion

In their recent articles on the moon illusion [Science 136, 953, 1023 (1962)], Kaufman and Rock note the long history of concern with this phenomenon. It is of interest that an experimental proof for the view that the presence of intervening terrain creates a sense of greater distance leading to the greater apparent size of the horizon moon was offered by Malebranche in 1693 ["Réponse à M. Regis," Oeuvres de Malebranche (Librairie Philosophique J. Vrin, Paris, 1960), vol. 17, pp. 266–7]. In translation, the passage reads as follows.

"Take a flat piece of glass such as a broken glass pane. Heat it gradually and evenly while passing it over a candle flame at a distance of 3 or 4 fingers so that it won't break. When it becomes warm, lower it into the flame and leave it there until it is covered with smoke, so that by looking through it you are able distinctly to see the flame without seeing other, less brilliant objects.

"With a glass thus blackened, one will see the sun and the moon to be of the same size at the horizon . . . provided the glass is close enough to the eyes to entirely exclude the sky and the land. . . . If the sun is at the horizon, the interposition of the glass will make it appear approximately two times nearer and four times smaller, as here precision is not necessary. But if it is risen high above the horizon, the glass will produce no considerable change either in its distance or in its apparent size. . . .

"This being so, it is clear that the interposition of the glass does not change the actual size of the retinal image made by the moon, as it loses nothing of its apparent size when we look at it above our head through this glass. But when it is at the horizon, its distance and its apparent size are notably diminished by the interposition of the glass; this does not at all change its image and only excludes other objects. Thus it is evident that the reason the moon appears large is that the perception of the surrounding land makes us judge it farther away."

Malebranche recognized that the illusion disappeared when one could not see the intervening terrain, and that it was the horizon sun or moon which decreased both in apparent size and in apparent distance. He emphasized that the terrain had to be entirely eclipsed, else the illusion would remain: "For, if one glimpsed the sky and the terrain even a little, this glass would not change the apparent size of the sun, because one would judge it to be more distant than the terrain which one saw dimly."

Kaufman and Rock suggest that if the illusion is defined in terms of size constancy, one must conclude that it is based on the smaller appearance of the zenith moon. While neither moon, horizon, nor zenith would be perceived as equal in size to a disk approximately 2162 miles in diameter at the earth's surface, the illusion can be eliminated most easily by procedures which reduce the apparent size of the horizon moon.

Norman I. Harway
School of Medicine and Dentistry,
University of Rochester,
Rochester, New York

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A symposium on nuclear proteins, viruses, and atypical growth will be held on 26 October in New Haven, Connecticut. Subjects include tumor viruses and cancer causation, the genetic code, gene expression and cellular cybernetics, viral function and gene action, and the spectrum of human genetics. (L. L. Waters, Jane Coffin Childs Memorial Fund for Medical Research, 333 Cedar St., New Haven 11, Conn.)

A science writers' seminar on respiratory diseases will be held from 30 October to 2 November in Princeton, N.J. Topics will include research on viral infections, chronic bronchitis and emphysema, failures in the treatment of tuberculosis, and air pollution. (National Tuberculosis Association, 1790 Broadway, New York 19)

The 1st Congress on the Information System Sciences will be held from 18 to 21 November at Hot Springs, Virginia. Sponsored by the Air Force Electronic Systems Division and the MITRE Corporation, the meeting will emphasize the role of science in the automation of military information systems. All sessions will be devoted exclusively to technical discussion of the subject matter involved; no papers will be read. Attendance is by invitation only. (Edward M. Bennett, MITRE Corporation, P.O. Box 208, Bedford, Mass.)

Scientists in the News

Richard S. Himes, former lecturer in radiobiology at Thiel College, has joined the medical department of the Norwich Pharmacal Company's Eaton Laboratories Division, New York.

At the U.S. Public Health Service: Arnold B. Kurlander, recently retired assistant surgeon general of PHS, has been named director of Sinai Hospital, Baltimore, Md.

Wallace L. Chan, the Service's director of investigations, has resigned to become vice chancellor for research and development at the University of California (Davis).

Elizabeth F. O'Connor, chief technologist in the Illinois Bell Telephone Company's medical department, has received the 1962 Corning award as the year's "outstanding medical technologist in the United States."

Ragnar Rollefon, former chairman of the department of physics at the University of Wisconsin, has been appointed director of international scientific affairs for the U.S. Department of State. He will also act as adviser to the Secretary of State on scientific and technological matters.

Recipients of the American Heart Association's 1962 Howard W. Blakeslee awards for "outstanding reporting on diseases of the heart and blood vessels" are:

Alexander Gifford, medical reporter for the Baltimore News-Post and Sunday American.


Robert A. Kuhn, New Jersey physician, for his article in the May 1961 Everywoman's Family Circle Magazine.


Floyd T. Gould, physicist at Knolls Atomic Power Laboratory, has been appointed manager of the physics department at Isomet Corporation, Palisades Park, N.J.

W. J. Burke, head of the department of chemistry at the University of Utah, has resigned to accept a position as executive vice president and professor of chemistry at Arizona State University. He is succeeded by David M. Grant, a member of the department staff.

Fred H. Harrington, until recently president-designate of the University of Hawaii, has been released from that commitment so that he may accept the presidency of the University of Wisconsin. He succeeds the late Conrad A. Elvehjem.


Rutherford N. Robertson, professor of botany, University of Adelaide, South Australia.

Edward J. Dijkstra, professor at the University of Utrecht (Holland), has received the $1500 George Sarton award for "outstanding performance in the history of science."

LeRoy C. Keagle, former president and dean of the New England College of Pharmacy, is dean of the recently established Northeastern University College of Pharmacy. The new college was created by the merger of NECP and Northeastern.

Recent Deaths

Cornelius Betten, 84; emeritus professor of entomology and former dean of the faculty at Cornell University's New York State College of Agriculture; 27 Aug.

John H. Bradley, 63; paleontologist and educational and scientific writer; 18 Aug.

Thomas C. Carter, 83; retired professor and head of the biology department and dean of administration at Northwestern State College; 27 June.

Daniel G. Clark, 61; plant physiologist in the department of botany, Cornell University; 13 Apr.

William W. Coblenz, 88; physicist and founder and retired chief of the radiometry section in the National Bureau of Standards; 13 Sept.

Nelson C. Dale, 82; retired professor of geology at Hamilton College, Clinton, N.Y.; 15 Sept.

A. J. Goldforb, 81; emeritus professor of biology at the City College of the City of New York; 17 Mar.

Clarence O. Grandfield, 69; retired U.S. Department of Agriculture agronomist at Kansas State University; 30 Aug.

Perly M. Lombard, 76; horticulturist with the Department of Agriculture for 38 years; 27 Aug.

Jeanette E. Muther, 51; research staff member at Brookings Institution; 27 Aug.

Judson H. Robertson, 70; professor of chemistry at the University of Tennessee; 23 Aug.

Robert E. Snodgrass, 87; entomologist formerly with the U.S. Department of Agriculture; 3 Sept.

Norman N. Tilley, 70; retired aeronautical engineer with the Bureau of Naval Weapons; 25 Aug.

Gordon L. Walls, 57; professor of physiological optics at the University of California School of Optometry; 22 Aug.
which might be drawn from these papers is that the more applied the experiments, the less pessimistic the conclusions concerning behavioral problems in space flight. The final section contains papers on hypothermia, hypnosis, and the concept of the cyborg, which is defined as “the extension of homeostatic controls by means of cybernetic techniques.” These final papers suggest the possibility that man may take some stupendous trips in a rather stuporous state.

BRYCE O. HARTMAN
7615 Quail Run Road,
San Antonio, Texas

Advanced Textbook


There is every cause to applaud the basic purpose of this book, which should soon become accepted as the standard textbook in carbon stereochernistry and which, as such, should also be the guidebook to this important field. It is an overdue modernization of the work by Shrirner, Adams, and Marvel and by Wheland, and it presents the new systems and methods of nomenclature and configurational assignment, with an extensive treatment of conformational analysis.

The subject of stereochernistry has grown to “impossible” proportions, as W. Kline has noted, but in my opinion, the task of inclusion and exclusion has been carried out exceedingly well in this book. The stereochernistry of nitrogen is treated in several sections, but that of the other elements (with the exception of carbon) is not mentioned. This major exclusion may also be read into the book’s somewhat ambiguous title.

That this is an advanced text is evident from its assumption of a preliminary understanding of chemical reactions, nomenclature, thermodynamics, and kinetics. The seven or eight “reader exercises” scattered through the book are too simple and too few, to serve as problems for students, but each chapter concludes with a selection of general references that constitute a list of previous treatments and, thus, a source for further reading. Specific references appear on each page. The author writes well and critically and, in some instances (page 246), he discusses current questions when available data allow only tentative conclusions.

Errors inevitably occur in a work of this compass, but in this volume they are not serious. On page 39, for example, racemization is not evidently due to change of configuration at the No. 5 carbon. Digitonin (page 59) is a saponin. Printing errors are found on pages 65, 97, 387, and 410. Casual inspection of the author index shows that the entry “R. Adams” includes the citations to the work of two people. The subject index withstood my spot check for errors, but it failed to direct me to the subject of the shape of heterocyclic rings (page 246), except under the terms morpholine and piperedine, or to interconversion of amine enantiomers (page 385). Some readers will be irked by the frequent necessity of turning one or more pages in order to examine both a figure and the text material that applies to it.

This book is well done and although it will be most useful to students, it will find a place on many reference shelves as well.

GEORGE W. MOERSCH
Department of Chemistry, Research Laboratories, Park, Davis and Company, Ann Arbor, Michigan

Notes

Visual Books Series

Space, the Architecture of the Universe, by Gottfried Honegger and Peter van de Kamp (Dell, New York, 1962. 120 pp. Paper, $0.95), is the first of a new paperback series that will present to the student and the general reader factual knowledge in an unusual and colorful manner. An artist and a recognized scholar closely collaborate, with the aid of four-color art, the result being a book that is half color drawings and pictures and half text. Space is really a book on “instant astronomy,” which has little if anything to do with present space efforts as such. The book is marred by a number of errors, the diagrams are too often confusing, the colors are sometimes inappropriate, and far too many statements need to be qualified. However, the approach is useful and interesting and should appeal to most readers.

JOHN B. IRWIN
Goethe Link Observatory, Indiana University

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trist, Veterans Administration Mental Hygiene Clinic, Los Angeles, 1948; Good Samaritan Hospital, 1948–49, Mt. Sinai Hospital, 1955–58, Compton Sanatorium, 1955–58, Edgemont Hospital, 1956–58; medical director, American Psychiatric Association, 1958–62; Fulbright research scholar, University of Groningen, Netherlands, 1962–63; editor-in-chief, Mental Hospitals, 1958–62; consultant and lecturer, Department of Neuropsychiatry, Walter Reed Army Medical Center, 1958--; special professional lecturer, George Washington University Medical School, 1962--; member, Editorial Board, Excerpta Medica, 1953–56; member, Board of Directors, American Society of Mental Hospital Business Administrators, 1959–62.

AAAS activities: member, Council, 1958–.

Kenneth C. Spengler


AAAS activities: member, Council, 1949--; member, Council Agenda and Resolutions Committee, 1958–60; member, Committee on Council Affairs, 1961.

Forthcoming Events

October

29. Vacuum Microbalance Techniques, symp., Los Angeles, Calif. (Cahn Instrument Co., 15505 Minnesota Ave., Paramount, Calif.)

29–30. Large Rockets, natl., Sacramento, Calif. (Inst. of the Aerospace Sciences, 2 E. 64 St., New York 21)
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5-7. Protection against Radiation Hazards in Space, symp., Galitnburn, Tenn. (E. P. Biddulph, Dep. Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn.)

5-9. American Inst. of Mining, Metallurgical, and Petroleum Engineers, fall meeting, Chicago, Ill. (Executive Secretary, AIME, 345 E. 47 St., New York 17)

5-9. German Ceramics Soc., annual, Baden-Baden. (Deutsche Keramische Gesellschaft, Menzenbergerstr. 47, Bad Honnef am Rhein, Germany)

5-9. Metallurgical Congr., intern., Chicago, III. (C. Wells, American Soc. for Metals, 7301 Euclid Ave., Cleveland, Ohio)


5-17. World Meteorological Organization, South-West Pacific Regional Assoc., Noumea, New Caledonia. (Secretary, WMO, Geneva, Switzerland)

7-10. Acoustical Soc. of America, Seattle, Wash. (W. Waterfall, Amer. Inst. of Physics, 335 E. 45 St., New York 17)

7-10. Corrosion of Metals, symp., Kanpur, India. (Defence Research Laboratory, Kanpur)


7-10. Geological Soc. of America, Houston, Tex. (F. Betz, Jr., GSA, 419 W. 117 St., New York, N.Y.)


8-10. American Soc. of Cytology (formerly Inter-Soc. Cytology Council), annual, St. Louis, Mo. (P. A. Younge, 1101 Beacon St., Brookline 46, Mass.)


8-13. International Office of Epizootics, American regional conf., Mexico City, Mexico. (R. Vittoz, 12 rue du Prony, Paris 17e, France)


12-13. Genetics Symp., Columbia, Mo. (Director, Postgraduate Medical Education, M176 Medical Center, Univ. of Missouri, Columbia)


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Radio Engineers, Office of the Professional Groups Secretary, 1 E 79 St., New York 21)
12–16, Australasian Corrosion Assoc., annual conf., Auckland, New Zealand. (Conference Secretary, ACA, Box 995, Auckland)
12–16, Conservation and Management of Temperate Marshes and Wetlands, conf., Arles or Saintes-Maries-de-la-Mer, France. (L. Hoffman, Station Biologique de la Tour de Valat, Par Le Sambuc (B du Rh.), France)
12–17, Czechoslovak Medical Congress, Prague. (K. Räiska, Czechoslovak Medical Soc. J. E. Purkyň, Sokolská 31, Prague)
13–15, Institute of Radio Engineers, Northeast research and engineering meeting, Boston, Mass. (L. G. Cumming, IEEE, 1 E 79 St., New York 21)
13–18, American Rocket Soc., annual meeting and space flight exposition, Los Angeles, Calif. (ARS, 500 Fifth Ave., New York 36)
13–22, Soil, intern. conf., Wellington, New Zealand. (ISC, Secretary General, P.O. Box 8001, Wellington)
14–17, Society of Naval Architects and Marine Engineers, annual, New York, N.Y. (Secretary, SNAME, 74 Trinity Place, New York 6)
15–17, Cold Metal Working, intern. conf., Budapest, Hungary. (Hungarian Soc. of Mechanical Engineers, Szabadság tér 17, Budapest 5)
15–18, American Anthropological Assoc., Chicago, Ill. (T. E. Boggs, 1530 P St., NW, Washington 5)
15–18, International Federation of Blood Donors’ Organizations, congress, Monaco. (V. Formentano, Largo Volontari del Sangue 1, Milan, Italy)
16–17, American Mathematical Soc., Tallahassee, Fla. (AMS, 190 Hope St., Providence 6, R.I.)
16–17, Communications, symp., Montreal, P.Q., Canada. (A. B. Oxley, Canady 1RE Symp. on Communications, Box 802, Station B, Montreal)
17, American Mathematical Soc., Los Angeles, Calif. (AMS, 190 Hope St., Providence 6, R.I.)
18–21, Brain Mechanisms for External Inhibition (closed meeting), Los Angeles, Calif. [Air Force Office of Scientific Research (Attention: SRL), Washington, D.C.]
19–20, Mid-America Electronics Conf., Kansas City, Mo. (J. Warfield, Dept. of Electrical Engineering, Univ. of Kansas, Lawrence)

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Other Growth Symposia—
Synthesis of Molecular and Cellular Structure, Dorothea Rudnick, Ed., with 10 Contributors. 1961. 255 pp., illus. $9.00
Developing Cell Systems and Their Control, Dorothea Rudnick, Ed., with 120 Contrib. 1963. 320 pp., illus $9.50
Cell, Organism, and Milieu, Dorothea Rudnick, Ed., with 10 Contributors. 1959. 215 pp., illus. $9.50
Developmental Cytology, Dorothea Rudnick, Ed., with 10 Contributors. 1959. 215 pp., illus. $9.50

Control Mechanisms in Cellular Processes
Edited by DAVID M. BONNER,
University of California, San Diego

The 7th annual symposium publication of the Society of General Physiologists presents nine studies on the regulatory mechanisms by which chemical processes are organized and integrated in living cells and organisms. The approach is through concrete consideration of the integration of separate biochemical events and the coordinate regulation of cellular biochemistry. Discussions include: DNA and RNA and their roles in enzyme formation; estrogenic steroids in hormonal control; control by light and time; tissue invertebrates; symbiotic relationships of plant tissues; biologically active hormones; etc.

Other S. G. P. Symposia—
Macromolecular Complexes, M. V. Edzes, Jr., Ed., with 18 contributors. 1959. 213 pp., illus. $9.00
Subcellular Particles, Teru Hayashi, Ed., with 20 Contributors. 1959. 213 pp., illus. $9.00
Physiological Triggers and Discontinuous Reproduction, Theodore H. Bullock, Ed., with 16 contributors. 1957. 179 pp., illus. $7.50
Electrolytes in Biological Systems, Abraham M. Shames, Ed., with 11 Contributors. 1955. 243 pp., illus. $9.00

The Story of Pollination
B. J. D. MEEUSE, University of Washington

This stimulating volume provides an engagingly written yet scientifically sound account of the complex phenomenon of plant reproduction. Based on personal observation in many parts of the world, the book explores the principles of pollination and the ways flowers create their color effects, the role posed by various guides in fruiting structures, the hidden nectar, etc. It discusses insect pollination, self-pollination, and those flowers whose flowers rely on wind or water for pollination. Superbly illustrated with black-and-white and color drawings and close-up photographs. 1967. 243 pp., illus. $7.50
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| %N     | 19.16  |
| %P     | 8.48   |
| N/P    | 2.25   |
| %H₂O   | 4.9    |
| H'vy Met. | none   |

Clarity test

5% Soln. at pH 5.0 clear at 25 °C

[α] 25 D

Conc. = %

Element %

Paper Chromatography

Solvent Amount Rp Other Components % Rp Chem

F 200t .65 none --

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Ratios at pH 250/260 280/260 290/260

7 78 16 0

% by total absorption

pH pH

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Battery powered sequence timer provides switch closures and openings ranging from once every 10 minutes to once every 12 hours. A 4.5-volt battery powers the timer for from 8 to 12 months. Accuracy is said to be ±10 sec/day over a temperature range 30° to 140°F and is unaffected by voltage variations. The 15-jewel driving movement is temperature compensated and has shock-mounted pivot shaft bearings. A single-pole-double-throw switch is actuated by a cam mounted on the output shaft. Cams are available with 1, 2, 3, 4, or 6 lobes. Switch closure times are adjustable.—J.S. (Geodyne Corp., Dept. S396, 180 Bear Hill Rd., Waltham 54, Mass.)

The model 2619 cathode follower operates in the temperature range −65° to +500°F so that it may be mounted in close proximity to piezoelectric transducers designed to operate at high temperatures thus avoiding loss of signal that would result if long cables were used to run from the high-temperature area to a lower temperature area. All electronic components are vibration isolated from the external housing and the instrument is resistant to a saw-tooth shock pulse of 6 msec duration and 100g amplitude. Output is linear to 5 volts r.m.s., 0.5 ma. Frequency range is less than 2 cy to 20 key/sec within ±2 percent with 100-kohm load. Size is 1 by 1 by 2.5 inches.—J.S. (Endevo Corporation, Dept. S394, 161 East California Blvd., Pasadena, Calif.)

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AAAS Symposium Volume No. 64

Edited by R. F. Sognnaes

July 1960

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Warburg syringe manometers combine the recently introduced plastic micrometer syringe with a short "U" tube to measure gas volume changes. The gas volume is measured by restoring the pressure to the starting point after the syringe barrel has been rotated until the fluid levels in the manometer are equal. The volume is then read from the micrometer in 0.2-μl divisions, to a capacity of 200 μl. Overall length of the manometer assembly is one-third that of the usual 300-mm manometers. The manometers are available for single vessel or for differential pressure in two flasks.—R.L.B. (Roger Gilmont Instruments, Inc., Dept. S341, 1 Great Neck Rd., Great Neck, N.Y.)

Geiger-Mueller survey meters are fully transistorized and operate on ordinary flashlight batteries (D cells). Plug-in printed circuit cards are used to simplify maintenance in the field. The weight, including the meter unit, probe, and case, is 4½ pounds. The model 2651 has a side-window probe, for hard beta and gamma measurements, equipped with a revolving shield which cuts out beta radiation when desired. The model 2652 has an end-window probe for alpha, soft beta, and gamma measurements. Alpha and beta measurements as low as 40 keV may be made, or a cap on the probe may be used to shield out alphas and betas, thus permitting gamma surveying only. Both probes may be purchased separately. A color-coded meter scale has seven overlapping ranges up to 100 mr/hr and 150,000 cpm. Selectable time constants on the most sensitive ranges allow fastest response times consistent with accuracy. The probe may be used in the adjustable, all-position mount on the case or held free at the end of a 40-inch coiled, retractable cable. A miniature earphone for aural monitoring and a calibration source are also supplied. The instrument

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Fluorescence attachment for Beckman DU and DK spectrophotometers replaces the standard source unit on these instruments. The sample in a test tube is illuminated with ultraviolet light from a high-efficiency, low-pressure mercury lamp. A fluorescent phosphor in the lamp converts the energy in the mercury resonance radiation into a continuum of longer wavelength ultraviolet light. A Schott UG-11 filter eliminates visible radiation and transmits a higher percentage of the ultraviolet light, below 400 mμ. Light from the sample at 90 deg from the incident radiation enters the spectrophotometer for measurement of spectra or intensity at a selected wavelength. When used as a fluorometer the ultimate sensitivity is given as 0.5 parts per billion of quinine sulfate. The sample housing may be water-cooled for temperature sensitive materials and paper chromatogram strips ½ by 1½ inches can be placed in the sample holder.—R.L.B. (Beckman Instruments, Inc., Scientific and Process Instruments Division, Dept. S363, Fullerton, Calif.)

Miniature multichannel oscillograph recorders are available in three models recording on 35-mm, 60-mm, and 70-mm film with 9, 15, and 18 channels, respectively. The instrument uses interchangeable pencil galvanometer elements with sensitivity 1.53 μa/cm at a natural frequency of 40 cy/sec. Frequency response is d-c to 6000 cy/sec natural frequency. Two ranges of five film transport speeds from 0 to 12 in./sec are provided by interchangeable gears. Chart capacity is 50 feet for paper and 35 feet for film daylight loading in interchangeable automatic cassettes. A 200-foot magazine is available as an accessory. A time base driving one or two galvanometers can be built in. Light spots may be deflected from the film plane to a spot setting screen. Trace identification is provided on color film by individual color filters and on monochrome film or paper by a built-in sequential trace breaker. Trace width is 0.006 inch. According to the manufacturer, reading accuracy can be as high as ±0.1 percent in the 70-mm instrument and ±0.2 percent in the 35-mm instrument when trace excursions need not be limited. Size of the nine-channel instrument is 9.8 by 4.12 by 2.75 inches and of the 18-channel instrument 9.8 by 4.12 by 4.12 inches.—J.S. (Technic [Cambridge] Ltd., Dept. S401, Brunswick Pike, Princeton, N.J.)

Dosimeter that will detect as little as 0.1 r is based on the thermoluminescent property of manganese-activated fluoride crystals which will trap electrons in lattice defects caused by radiation. The amount of trapping, and therefore of luminescence, is said to be directly proportional to the amount of radiation. The crystals can be neutralized after they have been read. Dosimeter units have been developed in the form of flat plaques and needles. A readout unit measures the accumulated dose from 0.1 to 10 kr. The unit consists of a heater to bring the dosimeter up to luminescence temperatures, a multiplier phototube, an amplifier, and an output indicating meter.—J.S. (Metcom, Inc., Dept. S406, 76 Lafayette St., Salem, Mass.)