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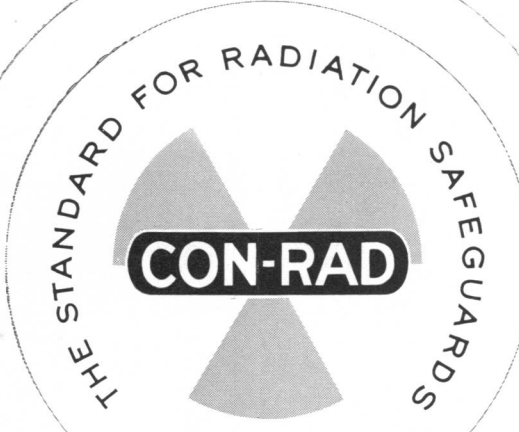
In the application of atomic energy
extensive safeguards must be employed
to assure protection against
the harmful effects of
ionizing radiation.



controls for radiation INC.

CON-RAD provides a comprehensive and
expert program for the control of
radiation hazards as they are encountered in
nuclear-reactor operation, uranium ore mining and milling,
fuel fabrication and reprocessing,
radioisotope laboratories,
particle accelerators, and
high-level gamma irradiation facilities.

The utilization of
CON-RAD'S coordinated services
assures that governmental regulations
are being fully complied with
and that optimum protective measures
for employees and the general public
are installed and maintained.

Two brochures are available on request:
S-1 — Radiation Hazards Protection Program;
S-2 — Applied Nuclear Research and Radioanalytical Services.

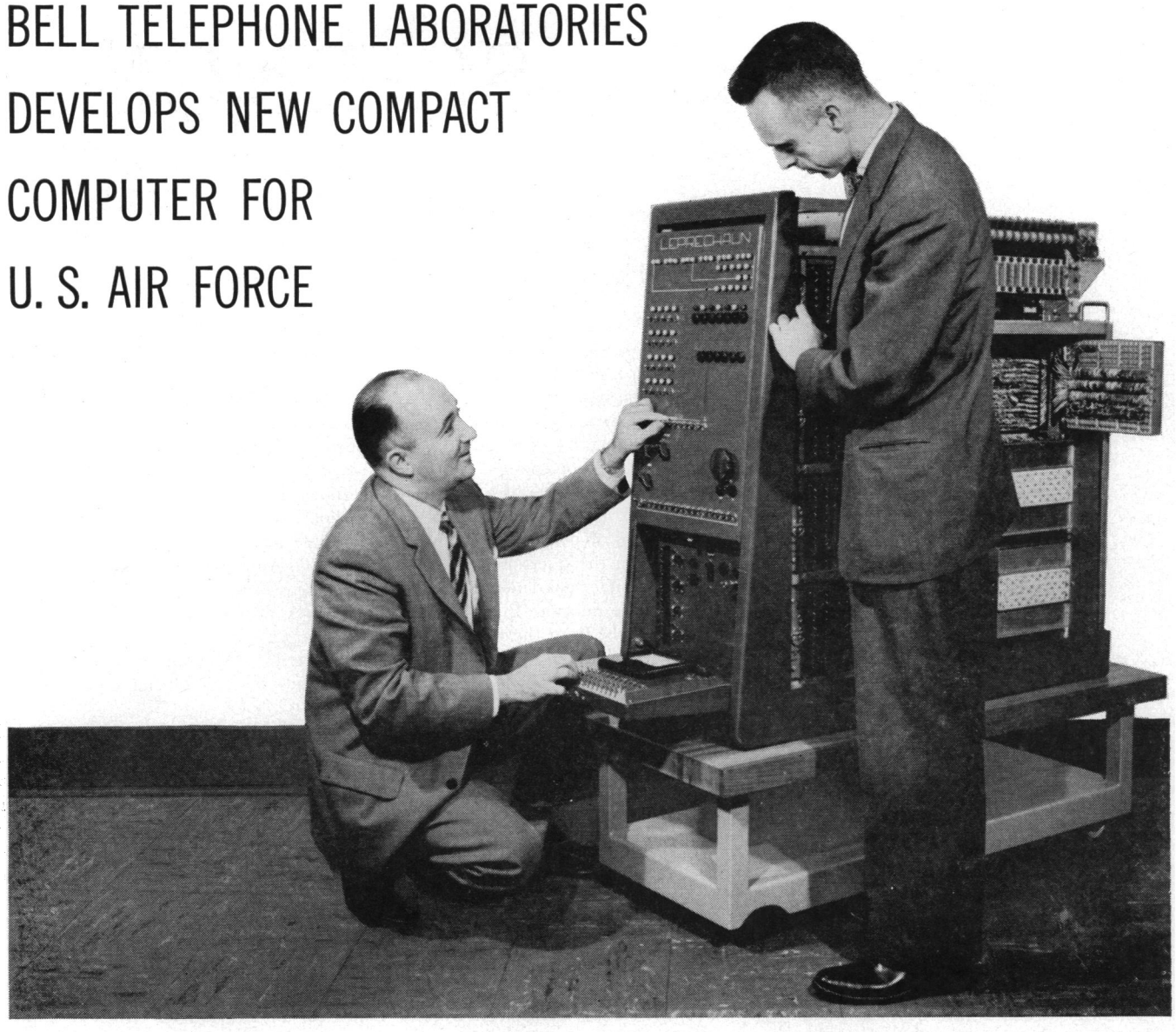
RADIATION HAZARDS PROTECTION SERVICES

Hazards Summary Report
Pre-operational Radioactivity Surveys
Radiological Safety Education
Radiation Protection Procedures and Standards
Leasing of Monitoring Instrumentation Systems
Film Badge Service
Bio-assays for Radioactivity
Operational Surveys

Proposals will be made without obligation for a program involving any or all of the above services.

CONTROLS for RADIATION, inc. 130 Alewife Brook Parkway, Cambridge 40, Massachusetts

BELL TELEPHONE LABORATORIES DEVELOPS NEW COMPACT COMPUTER FOR U. S. AIR FORCE



J. A. Githens, B.S. in E.E., Drexel Institute of Technology, and J. A. Baird, Ph.D. in E.E., Texas A. & M., check the control panel of Leprechaun, a new high-speed computer which solves extremely complex problems in one-tenth of a second. Small size and low power are made possible by new design principles and Bell Laboratories' invention of the transistor.

The United States Air Force assigned Bell Labs an interesting assignment: develop a new kind of electronic computer. The major requirement was greater simplicity. Of course, no computer is simple, but this one (known as "Leprechaun" to its designers) is much smaller and simpler than most of the computers currently in use.

It has only some 9000 electrical components; 5000 of them are transistors. As a result, Leprechaun has less than one-third the components of conventional computers. This facilitates testing, experimentation, assembly and service.

Even in its experimental state, Leprechaun is a stimulating example of great strides in the simplification and miniaturization of circuitry . . . a problem of profound interest to all Bell Laboratories researchers as they develop radically new equipment for your future telephone service.

BELL TELEPHONE LABORATORIES

WORLD CENTER OF COMMUNICATIONS RESEARCH AND DEVELOPMENT

rems are established, Prandtl-Meyer flow is presented, and the hodograph and other transformations are introduced. There follows a chapter on steady, ideal, plane, and axisymmetric subsonic flow. This chapter contains a detailed treatment of linearized theory, the Prandtl-Glauert rule, and the methods of Rayleigh-Janzen and Karman-Tsien. Numerical relaxation methods are treated briefly.

The next chapter deals with steady, ideal, plane, and axisymmetric supersonic flow. Linearized theory is presented, followed by consideration of the oblique shock and applications of the method of characteristics to nonlinear isentropic flow. Specific applications are given to airfoils, nozzles, jets, cascades, and bodies of revolution at incidence. There is a brief discussion of hypersonic flow. The next chapters deal with transonic flow and with miscellaneous unsteady multidimensional flow situations. There is a brief chapter summarizing some of the more important results for compressible boundary layers, laminar and turbulent jets, separation, stability, and shock-wave thickness.

The volume closes with a survey of some of the more standard experimental techniques. There are no exercises. The bibliography is somewhat brief. There are brief tables and charts for the dynamic relations of various gases.

SAMUEL A. SCHAAF
University of California, Berkeley

The North American Deserts. Edmund C. Jaeger. Stanford University Press, Stanford, 1957. x + 308 pp. Illus. $5.95.

Edmund C. Jaeger, curator of plants at the Riverside Municipal Museum, is a student of desert ecology, acquainted with animals as well as plants. He is also a competent expositor and illustrator, whose knowledge and talents have been put to effective use in what adds up to a very convenient guidebook to the deserts of North America. Peveril Meigs has provided a good chapter on desert weather and climate, and the author acknowledges generous assistance from numerous other collaborators.

After a general discussion on deserts and the chapter by Meigs, five great desert areas—the Chihuahuan, Sonoran, and Mohave deserts, the Great Basin, and the Painted Desert—are described. The account of one of them, the Sonoran, is broken up into six subdivisions. Physical conditions, flora, fauna, and human cultures are dealt with in a manner that should be appreciated by professional worker and layman alike; both popular and scientific names are given for all organisms. Helpful travel hints are also included. This portion of the book is well illustrated with maps and photographs.

It is followed by some 130 pages of plates and brief descriptions of desert insects, reptiles, birds, mammals, and plants, by a page on the euphonious Spanish names, so indispensable in the Southwest, and by a good index.

Apart from their intrinsic interest and beauty and the growing pressure to convert them into something "useful," deserts are becoming of increasing interest from a scientific standpoint. In Inner Mongolia, Spain, and our own Southwest, the sediments of former lakes are revealing records of climatic change extending back through the Pleistocene and beyond, giving a continuity not possible within the glaciated region itself. Scientists who will, in increasing numbers, be engaged in such studies owe a debt of gratitude to Jaeger and his collaborators, since the desert is not likely to be a familiar environment to many of them.

PAUL B. SEARS
Conservation Program,
Yale University

New Books

Artificial Stimulation of Rain. Proceedings of the first Conference on the Physics of Cloud and Precipitation Particles. Held at Woods Hole Oceanographic Institution, Woods Hole, Mass., 7–10 Sept. 1955. Pergamon Press, New York and London, 1957. 443 pp. $15.

Forest Fertilization. A bibliography, with abstracts, on the use of fertilizers and soil amendments in forestry. Compiled by Donald P. White and Albert L. Leaf. State University College of Forestry, Syracuse University, Syracuse, N.Y., 1957. 303 pp. $3.

Instinctive Behavior. The development of a modern concept. Translated and edited by Claire H. Schiller. International Universities Press, New York, 1957. 347 pp. $7.50.

No and Yes. On the genesis of human communication. Rene A. Spitz. International Universities Press, New York, 1957. 182 pp. $4.

Surgery in World War II. Ophthalmology and *Otolaryngology.* John Boyd Coates, Jr., Ed. Medical Department, U.S. Army, Washington, 1957 (order from Supt. of Documents, GPO, Washington 25). 628 pp. $5.

Manual of Microbiological Methods. Society of American Bacteriologists, Committee on Bacteriological Technic. McGraw-Hill, New York, 1957. 325 pp. $5.50.

Deafness, Mutism and Mental Deficiency in Children. Louis Minski. Philosophical Library, New York, 1957. 90 pp.

The Volunteers. Means and ends in a national organization. David L. Sills. Free Press, Glencoe, Ill., 1957. 340 pp. $6.

Human Histology. A textbook in outline form. Leslie Brainerd Arey. Saunders, Philadelphia, 1957. 346 pp.

Atomic Power, an Appraisal. Including atomic energy in economic development. Corbin Allardice, Ed. Pergamon Press, New York and London, 1957. 151 pp. $3.50.

Cytochemical Methods with Quantitative Aims. Biophysical and biochemical approaches. Experimental Cell Research, Supplement 4, 1957. Proceedings of the symposium, 27–29 Sept. 1956, Institute for Medical Cell Research and Genetics, Karolinska Institutet, Stockholm, Sweden. Academic Press, New York, 1957. 296 pp. $9.50.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Federal Funds for Science. VI. The Federal Research and Development Budget, Fiscal Years 1956, 1957, and 1958. National Science Foundation, Washington, 1957 (order from Supt. of Documents, GPO, Washington 25). 60 pp. $0.40.

Education Associations. Part 4 of Education Directory 1956–57. Office of Education, U.S. Department of Health, Education, and Welfare, Washington 1957 (order from Supt. of Documents, GPO, Washington 25). 79 pp. $0.30.

American Museum of Natural History, Eighty-Eighth Annual Report, July 1956–June 1957. The Museum, New York, 1957. 77 pp.

The Age of Space. Proceedings of a nontechnical conference on missiles, rockets, and space travel—and their impact on our times. 16 May 1957. Southern Research Institute, Birmingham, Ala., 1957. 43 pp.

Scientific Resources of the San Francisco Bay Area. International Science Foundation, Golden Gate Park, San Francisco, 1957. 96 pp. $5.

Hydrography of the Faroe-Shetland Channel, 1927–1952. Scottish Home Department, Marien Research, 1957, No. 2. John B. Tait. Her Majesty's Stationery Office, Edinburgh, 1957. 309 pp. £5 5s.

Enuresis. A clinical and genetic study (*Acta Psychiat. et Neurol. Scand.*, vol. 32, Suppl. No. 114). Bertil Hallgren. Munksgaard, Copenhagen, Denmark, 1957. 159 pp.

Étude Théorique des Oscillations Libres (Seiches) du Lac Tanganika. Exploration hydrobiologique du Lac Tanganika, 1946–1947. vol. II, fasc. 3, *Resultats Scientifiques.* F. Servais. Institut Royal des Sciences Naturelles de Belgique, Bruxelles, 1957. 311 pp.

Inventions Wanted by the Armed Forces. U.S. Department of Commerce. National Inventors Council, Washington 25, 1957. 34 pp.

Polemoniacae of Nevada. Edgar T. Wherry. *Ipomopsis and Gilia Sect. Arachninon* contributed by Verne Grant and Alva Grant. Contributions toward a Flora of Nevada, No. 43. Plant Industry Station, Beltsville, Md., 1957. 103 pp.

Ecological Life History of the Warmouth (Centrarchidae). Survey Bulletin, vol. 27, art. 1. R. Weldon Larimore. Illinois, Natural History Division, Urbana, 1957. 84 pp.

Kodak reports on:

keeping your fingers dry . . . a victory and a project . . . a bid for free service from scientific Americans

Brute force

Photographic paper which requires no processing is of itself no news.* There may be a little news in that at least two major manufacturers of moving-mirror oscillographs now offer recording instruments based on what we call *Kodak Linagraph Direct Print Paper*. If *they* want to call it something else, we love them none the less.

In giving up photographic development, one gives up for the sake of dry fingers an energy amplification factor of enormous power. Nevertheless, we agree that dry fingers are nicer than wet fingers. We bow low to the optical design ingenuity that has contrived cool and quiet little boxes in which most satisfactory traces are put down through brute force of u-v radiation. One company claims frequencies to 2,000; the other, to "above 3,000," with trace velocities "above 30,000 inches per second."

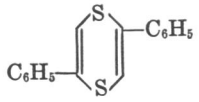
At low recording and writing speeds, focused energy from a high-intensity Hg-vapor ultraviolet point source is sufficient for a legible record. Where it isn't, use is made of a post-exposure to some 60 foot-candles from a fluorescent lamp. For all practical purposes the post-exposure raises the speed several hundred times. The trace comes out blue on a buff background. As with most miracles, the miracle of *Kodak Linagraph Direct Print Paper* becomes a little less miraculous upon quantitative study. The total energy delivered to the paper in the writing and the post-exposure is about the same as the radiant energy required by a conventional photographic enlarging paper. It's just that the energy requirement can be supplied in two separate doses.

If interested in this type of oscillography, watch for pertinent ads in the technical press and alert your purchasing agent to send in the next man who comes around with one of these instruments. If you have other ideas for this type of paper, Eastman Kodak Company, Graphic Reproduction Division, Rochester 4, N. Y., will try to be helpful by arranging with a local dealer to sell you some of it for experimentation.

*For better than 60 years we have made studio proof paper. On it many portrait photographers submit those brownish-purple proofs from which the customers select the poses they like. The proofs are to be returned. People, who instead stick them up on their boudoir mirrors, find they don't last very long in the light of day. That's the idea with studio proof paper—no developing *and no fixing*.

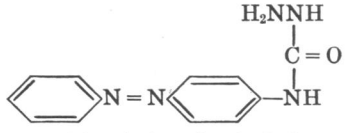
Sulfur encycled, carbonyl tinctured

• We attended a very, very fancy discussion of resonance states in heterocyclic compounds of sulfur. The man was trying to elevate us to a level of chemical understanding where in our mind's ear we would hear the electrons clicking in and out of the different orbital shells of the sulfur atom. We were having a tough time. Our mind has been dulled by immersion in commerce and trade. But we distinctly heard him speak of the dithiadiene ring as starting material for a whole new series of organic compounds, and he practically promised us that *2,5-Diphenyl-p-dithiin* is easy to make.



We took heart and tried it. Another victory, now bearing the designation Eastman 7442 and the price of $4.55 for 5 grams.

• We have Projects. We have a Project to develop reagents that would provide colored handles for various classes of compounds so that you could tell where they wound up in a chromatographic separation. Then you could hack out these sections or spots and go to work on them. In *p-Phenylazobenzoyl Chloride* (Eastman 5549) we have had such a reagent for sterols, sugars, and amino acids. (Procedural abstract on request.) Now we have one for carbonyl-containing compounds. In this case, instead of a mere abstract we offer you the far greater thrill of working out the entire procedure for yourself. Push off from *J.A.C.S.*, *77*, 6693 (1955), where this compound, *4-(p-Phenylazophenyl)semicarbazide*,



is considered for the isolation of carbonyl compounds of biological origin, trioses in particular. There is a part where they tell how to prepare the reagent. One skips that now. Instead, one orders Eastman 7443 at $4.30 for 5 grams.

From Eastman Organic Chemicals Department, Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company), purveyors of some 3600 miscellaneous compounds in laboratory quantities. Until recently it was "some 3500." This must mean that we are adding new ones faster than we are dropping old ones.

Get thee to a marker

Scattered over the land area of the United States lie more than 100,000 U. S. Coast and Geodetic Survey triangulation station markers. The Smithsonian Astrophysical Observatory and the U. S. National Committee for the International Geophysical Year would be grateful if you would arrange to have a camera over one of these markers at a time when some artificial satellite or other is in view, and photograph it. The camera should be tripod-mounted and cover at least a 4″ x 5″ negative with a 5″ or 6″ lens, *f*/4.5 or faster. The observer should have sufficient dexterity or cleverness at home-made instrumentation so that he can interrupt his trace for a few seconds and know the start of his interruption within 0.1 second against the time signals broadcast by Radio Station WWV. In addition to a reliable radio he needs a certain attitude.

The possessor of the requisite attitude does not consider himself traduced by the big surprise of October 4, 1957. On the contrary, he is pleased at the opportunity thrown his way when the large plans for optical tracking equipment proved too ponderous for the blistering pace set by our eager IGY collaborators on the other side of the barbed wire. He thinks it would be a healthy thing if it turned out that simple equipment, skillfully operated with amateur enthusiasm, could reveal almost as much about the shape of the earth and its gravitational field as had been expected of the optical heavy artillery.

If you are game, write to W. F. Swann, Eastman Kodak Company, Rochester 4, N. Y. Ask him for the details of the "Phototrack" assignment that the Society of Photographic Scientists and Engineers is issuing to scientific Americans.

Prices quoted are subject to change without notice.

Kodak
TRADEMARK

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science