

ditioned response strength produced by the two separate methods of reinforcement is only minor. Table 1 indicates that the reconditioning drop for irregular subjects is 5.2 b/m; for the previously reported regular group, the drop was 6.8 b/m. The difference between these drops is not significant ($P > .05$ by Pitman's spread test, based on rank-ordered data [10]).

3) *Extinction*: The most striking effect is found in terms of resistance to extinction; the irregularly reinforced subjects show a significantly greater perseveration of the conditioned response than do regularly reinforced subjects. Fig. 1 compares the resistance to

Table 2 gives a summary of the results of statistical comparisons made for the data illustrated in Fig. 1 (Pitman's nonparametric tests for correlated or uncorrelated items were used throughout, as appropriate). The probability values shown here, together with the data of Table 1, provide the basis for the following conclusions: (1) Heart rate changes may be conditioned in human beings by means of a schedule of irregular reinforcement. The fact that this autonomic response can be conditioned by such a technique meets a research need indicated by others (1). (2) The most conspicuous difference between the irregularly and

TABLE 2
PROBABILITY VALUES FOR TESTS OF SIGNIFICANCE BASED UPON COMPARISONS OF EXTINCTION EFFECTS FOLLOWING SCHEDULES OF REGULAR AND IRREGULAR REINFORCEMENT

	<i>R</i> vs <i>I</i>	<i>R'</i> vs <i>I'</i>	<i>R</i> vs <i>R'</i>	<i>I</i> vs <i>I'</i>
Extinction I	$P > .05$	$.05 > P > .02$	$.02 > P > .01$	$P > .05$
Spontaneous recovery	$P > .05$	$P > .05$	$P > .05$	$P > .05$
Extinction II	$P > .05$	$.05 > P > .02$	$.03 > P > .02$	$P > .05$

extinction of the regularly and irregularly reinforced groups during Extinction I, spontaneous recovery, and Extinction II. Two pairs of columns are shown for each phase; the first pair (solid columns) depicts data of the regular group; the second pair, data of the irregular group. The first member of each pair of columns (marked *R* for regular, or *I* for irregular) gives the group mean pre-tone minus group mean post-tone heart rate for the first five trials of each respective phase. The second member of each pair (marked *R'* or *I'*) gives the corresponding change in heart rate for the last five trials of each phase. By comparing each group's level of conditioned heart rate response for the first five and the last five trials of each phase, differences in the perseverative tendency of the response may be noted. Thus, for Extinction I, there is a marked drop in the conditioned heart rate effect for the regular group, but a slight rise for the irregular group. In general, a diminution of conditioned response strength during the tone-alone trials is characteristic for the regular group; the irregular groups show either a slight rise, or no difference.

regularly reinforced groups in the present research is in terms of the former's much greater resistance to extinction. It is noteworthy that this difference is obtained with an autonomically mediated response, inasmuch as the same effect has been almost universally observed with respect to motor responses (1).

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News and Notes

Scientists in the News

M. H. Arveson, technical director of the Indoil Chemical Co., has been elected director-at-large of the American Chemical Society. Originally named a director last April to fill the unexpired term of Edgar C. Britton, of the Dow Chemical Company, Mr. Arveson will now serve a full, four-year term.

Manuel Villafano Barajas, manager of the Comision de Fomento Minero, Mexico, is in this country to study and observe coal and iron mining techniques. His itinerary includes several mining operations, as well

as visits in the Denver office of the Geological Survey and Bureau of Mines.

Albert F. Blakeslee, a past president of the AAAS and now director of the Smith College Genetics Experiment Station, has received an honorary doctor's degree from the Sorbonne. The degree was conferred at the annual meeting of the American Members of the Institut de France, of which Dr. Blakeslee is president.

Fred M. Bullard, professor of geology at the University of Texas, will be on leave from the university

for a year to study Italian volcanoes, including Vesuvius, Etna, Stromboli, and others, under a Fulbright grant.

For distinguished services to the Pineapple Research Institute and the pineapple industry of Hawaii, the Board of Trustees has designated **Walter Carter**, head of the Department of Entomology, as senior scientist of the Pineapple Research Institute.

Earl C. Chamberlayne has been appointed to the staff of the Pan American Sanitary Bureau, WHO Regional Office. Following a month of orientation at PASB headquarters, he will be assigned to the zone office in Lima, as area supervisor in veterinary public health, to conduct consulting services in this field. His area of operations will embrace Peru, Bolivia, Ecuador, Venezuela, Colombia, the Guianas, and the Netherlands Antilles. Dr. Chamberlayne resigned his position as director of food control in the Manitoba Provincial Ministry of Health and Public Welfare, in Winnipeg, in order to work with the PASB.

John M. Clark will be the first occupant of the new chair in political economy at Columbia University named in honor of his late father, John Bates Clark, who was a professor of economics at Columbia.

Oxford University has announced the appointment of **George W. Corner** to be George Eastman visiting professor for the academic year 1952-53. He is director of the Department of Embryology of the Carnegie Institution, located at Johns Hopkins Medical School, in which he also holds the title of professor of embryology. The Eastman professorship, endowed thirty years ago by George Eastman, is attached to Balliol College, Oxford.

Katharine Dodd, associate professor of pediatrics at the University of Cincinnati College of Medicine, and a member of the staff of the Children's Hospital Research Foundation, has been appointed professor and head of the Department of Pediatrics at the University of Arkansas School of Medicine. Dr. Dodd replaces **William A. Reilly**, who has accepted a position as chief of the Radioisotope Laboratory of the VA Hospital in San Francisco.

Robert C. Fuller has been appointed vice president in charge of production and research by Chesebrough Manufacturing Company. Mr. Fuller succeeds **Cyril Y. Emery**, who is retiring because of ill health. Mr. Fuller joined Chesebrough in 1945 as assistant to the vice president in charge of production and research.

Long Island University has named **William M. Hudson** acting president and dean of the College of Arts and Sciences. Professor Hudson has been director of students at the university. **Tristram Walker Metcalfe**, president of the university, has been ill since May. Professor Hudson joined the university as chairman of the Department of Economics and Sociology in 1928.

E. Kanda, of the Cryogenic Laboratory of the Re-

search Institute for Iron, Steel and other Metals of Tohoku University, Sendai, Japan, has been a guest of the Cryogenics Laboratory of the National Bureau of Standards. Professor Kanda, who recently attended the Unesco Low Temperature Conference in Oxford, Eng., has returned to Japan.

J. Laurence Kulp (SCIENCE, 114, 565 [1951]; 115, 86 [1952]) was the twenty-fourth winner of the Newcomb Cleveland Prize (formerly the AAAS Thousand Dollar Prize), for his paper on "Natural Radiocarbon Measurements." Dr. Kulp, who is a geophysicist in Columbia University's Lamont Geological Observatory, described some of the newly developed techniques which were used in the carbon 14 method of dating deep-water samples.

F. V. Meriwether, after a 32-year career in the Public Health Service, the last two years in Atlanta as medical director for Region VI, has retired, and **R. A. Vonderlehr**, for five years medical director in charge of the Communicable Disease Center, was appointed to succeed him. **Justin M. Andrews**, deputy officer in charge of the center, succeeds Dr. Vonderlehr. All three officers hold commissions as directors (colonels) in the Regular Corps of the Public Health Service.

George E. Pfahler, of Philadelphia, received the gold medal of the Radiological Society of North America at its annual meeting, for outstanding achievement in radiology. **Joseph C. Bell**, of Louisville, took office as the society's new president. The president-elect, who will take office in 1952, is **Ira H. Lockwood**, of Kansas City, who has been chairman of the board of directors for the past year.

President Truman has accepted the resignation of **Sumner T. Pike** as a member of the Atomic Energy Commission. Mr. Pike has served on the AEC for more than five years and was the only remaining member of the original five-man commission.

In the Division of Forest Pathology of the Bureau of Plant Industry, Soils, and Agricultural Engineering, **C. Audrey Richards**, in charge of research on the deterioration of wood products at the Forest Products Laboratory of the Forest Service, is retiring after 34 years of service. **Ralph M. Lindgren**, formerly in charge of its cooperative investigations with the Southern Forest Experiment Station, takes her place, and **Arthur F. Verrall** takes over the studies of wood deterioration in the South. **Paul V. Siggers** has retired after 30 years of research, mainly on diseases of Southern pines, and is replaced by **Berch W. Henry**, Harrison Experimental Forest, Saucier, Miss.

Donald Stuart Russell, former assistant secretary of state, will become president of the University of South Carolina in June 1952. He will succeed **Norman M. Smith**, who revealed his plans for retirement two months ago.

Byron T. Shaw has been named administrator of

the Agricultural Research Administration, succeeding **P. V. Cardon**, who has retired following a career of 42 years as researcher, teacher, and administrator. Dr. Cardon will become assistant director of the USDA Graduate School. Dr. Shaw has been deputy administrator of ARA for nearly three and a half years, having been appointed to that position in August 1948. He had served as assistant administrator of ARA since early 1947.

Guy W. Thaxton has been appointed power engineer in the AEC Division of Construction and Supply. Mr. Thaxton was formerly regional power supply coordinator of the Defense Electric Power Administration.

Neely Turner, entomologist at the Connecticut Agricultural Experiment Station, has been appointed assistant director of the station. Mr. Turner joined the staff in 1927 as an assistant entomologist. He became associate entomologist in 1943, and entomologist in 1950.

Robert H. Whittaker, formerly assistant professor of zoology, Washington State College, Pullman, has joined the Aquatic Biology Unit, Radiological Sciences Department, Nucleonics Division, General Electric Company, Richland, Wash., to conduct research in radiological applications to synecology, dealing with food chains and functioning of natural communities.

Harry M. Zimmerman, chief of the laboratory division of Montefiore Hospital, has been appointed director of Yeshiva University's Medical School. It is the first appointment made to the new school, which is to open in the fall of 1953. Dr. Zimmerman is professor of pathology at the College of Physicians and Surgeons of Columbia University, has been a consultant in neuropathology at the Naval Hospital at St. Albans, and is a former president of the American Association of Neuropathologists.

Education

The **American Museum of Natural History** points out in its annual report that it has shifted its emphasis from collecting dead animals and artifacts to studies of living plants and animals and the chemistry and physics of their environment. The museum has research under way in cancer, petroleum exploration, psychology, conservation, and a special project to study the culture of the Soviet Union at long range. The new **Felix M. Warburg Memorial Hall**, opened in 1951, is a center for ecological research. More than two million people visited the museum in 1951.

John von Neumann, mathematician, of the Institute for Advanced Study, became **California Institute of Technology's** seventh visiting professor early this month. **Jan H. Oort**, astronomer, University of Leiden, was the sixth to join the staff. Other visiting professors at Caltech include **David Bishop**, biologist, of the University of Massachusetts; **Noboru Yamada**, plant physiologist, of the National Agricultural Re-

search Institute, Konosu, Japan; **Hans G. Borei**, biologist, of the Wenner-Gren Institute; **Egbert Havinga**, chemist, of Leiden's Laboratory of Organic Chemistry; and **E. G. Bowen**, physicist, of Australia's CSIRO.

Chicago Natural History Museum has announced a program of 22 expeditions for 1952. Among them will be an expedition to the "Lost World" of Venezuela, under the direction of **Julian A. Steyermark**, curator of the herbarium; the eighteenth expedition to the American Southwest, under **Paul S. Martin**; studies at Paricutin by **Sharat K. Roy**, geologist; an exploratory trip to Austria by **Rainer Zangerl**, curator of fossil reptiles; an ornithological survey of Mexico, conducted by **Emmet R. Blake**. **Bryan Patterson**, curator of fossil mammals, has gone to Argentina on a Guggenheim Fellowship for a year of collecting and research. The Department of Zoology will also have outside collectors on expeditionary work: **D. S. Rabor**, of Silliman University, collecting birds and mammals in Guatemala; and **Harvey A. Beatty**, of New York, collecting birds in West Africa. **Margery Carlson**, botanist, of Northwestern, will collect for the museum on an expedition to southern Mexico and Honduras.

The **Council on Postgraduate Medical Education**, the **Pennsylvania Chapter of the American College of Chest Physicians**, and the **Laennec Society of Philadelphia** will sponsor the annual postgraduate course in diseases of the chest, which will be presented at the Warwick Hotel, Philadelphia, Mar. 24-28. **Chevalier L. Jackson**, of Philadelphia, president of the American College of Chest Physicians, is chairman of the committee arranging the course. Further information may be obtained from the executive offices of the college, 112 E. Chestnut St., Chicago 11.

A B.S. in materials engineering will be offered this year in the **University of Michigan College of Engineering**. The first-year schedule is identical with that for all other engineering students, with specialization beginning in the second year. Emphasis will be placed upon the corrosion resistance of, and protective coatings for, such materials as cement, wood, plywood, metals, rubber, and plastics.

The **Tissue Culture Association** offers its annual course of lectures and laboratory instruction, under the direction of **John H. Hanks**, of the Leonard Wood Memorial, Harvard. Designed specifically for M.D.s or Ph.D.s, the course will be given in the laboratories of the **Mary Imogene Bassett Hospital**, Cooperstown, N. Y., Aug. 6-28. Application forms, which must be returned by *Apr. 15*, may be obtained from **Mary S. Parshley**, College of Physicians and Surgeons, 630 W. 168th St., New York 32.

Western Reserve University will present in its 1952 Frontiers in Chemistry lecture series "Recent Advances in Physical and Inorganic Chemistry" on March 7 and 21, April 4 and 18, and May 2, and "Acetylene and Petroleum Chemistry" on March 14 and 28, April 11 and 25, and May 9.

Grants and Fellowships

The American College of Chest Physicians, 112 E. Chestnut St., Chicago 11, is offering an annual cash prize for the best original contribution, preferably by a young investigator, on any phase of chest disease. The contest is open to scientists in other countries, as well as to U. S. citizens, but the manuscript must be presented in English, before *Apr. 1*. Further information may be obtained from the college.

Armour Research Foundation has available fifteen industrial fellowships in physics, chemistry, metallurgy, ceramics, engineering mechanics, and electrical engineering, for the academic year beginning in September. The recipients will attend Illinois Institute of Technology half-time and work in the Research Foundation half-time, besides being employed full-time by the foundation during the summer. Applications received prior to *Mar. 15* will be given first consideration. For information write to the Office of Admissions, Graduate School, Technology Center, Chicago 16.

George Eastman House of Photography is the recipient of a gift of \$100,000 from L. Corrin Strong, of Washington, D. C., as a memorial to Henry Alvah Strong, one of the financial backers of Mr. Eastman at the beginning of his career. The funds will be used for acquiring and preserving historical motion pictures, 90 per cent of which are on early nitrate stock. These perishable and inflammable films may now be copied on modern acetate safety stock, which will be stored in a building to be constructed by Eastman House and called the Henry A. Strong Archives.

Herman Frasch Foundation grants totaling \$300,420 have been awarded to Caltech, Colorado A & M, Cornell, Ohio State, Rutgers, and the universities of Missouri and Wisconsin. The institutions will receive the grants in five yearly installments, pending approval of the progress of their projects by the American Chemical Society, which acts as consultant in administering the \$1,000,000 foundation established by Elizabeth B. Frasch in 1924 in memory of her late husband, who was president of Union Sulphur Company.

Applications for **General Electric Company** fellowships must be filed by *Feb. 18* with the General Electric Educational Fund, Schenectady, N. Y. The fellowships will be awarded to graduate students for work in physical science, engineering, and industrial management under either the Charles A. Coffin Fellowship or the Gerard Swope Fellowship. General Electric has increased its aid to graduate students by raising amounts granted per student and by grants to the institutions to cover tuition and other costs formerly paid by the students themselves.

General Motors Corporation and the **Ford Motor Company** have made grants of \$200,000 to Wayne University for expansion and maintenance of the large-scale computing machine laboratory at Wayne

University. The university, now the owner of a differential analyzer and a cinema integrator, will acquire a digital computer, to be built at cost by Burroughs Adding Machine. Burroughs will also assist in the design.

Applications for **Public Health Service** research fellowships to begin between July 15 and March 14, 1953, should be filed by *May 1*, and for fellowships to begin between Nov. 15 and July 14, 1953, by *Sept. 1*. Applications and supporting documents should be sent to Division of Research Grants and Fellowships, National Institutes of Health, Bethesda 14, Md.

Annual Tau Beta Pi Fellowships for graduate study in engineering are intended to support an unmarried student, but some married applicants may be considered. Last date for filing is *Feb. 29*. For additional information, write Paul H. Robbins, 1121 Fifteenth St., N.W., Washington 5, D. C.

In the Laboratories

Ralph Bown, director of research for **Bell Telephone Laboratories** since 1946 and a member of the Bell System for more than 30 years, has been appointed vice president in charge of research. Much of his work has been in the various aspects of radio broadcasting and ship-to-shore and overseas telephony. Other changes at Bell Labs include the appointment of the following directors of research: J. B. Fisk, physical sciences; H. T. Friis, high frequency and electronics; W. H. Doherty, electrical communications. R. M. Burns, director of chemical and metallurgical research, has been appointed chemical coordinator.

Minneapolis-Honeywell Regulator Company has retained Larell B. Harmon, former director of school health service for the Texas State Department of Health, as a school consultant, and is underwriting an extensive research investigation into schoolroom heating conditions under Dr. Harmon's direction. The current work is a continuation of extensive studies already made by Dr. Harmon into the effects of improper lighting, seating, decorating, and other arrangements in the classroom on the health, development, and learning ability of school children.

Parke, Davis & Company is completing an ultra-modern new laboratory to house the greater part of the Products Development Department. Thomas C. Anderson has been made director of production and engineering and will have charge of all such operations in this country and abroad. Dr. Anderson joined Parke-Davis in 1921 as a chemical engineer. Among others who will have new responsibilities this year are W. C. Richardson, who will be director of engineering and of overseas engineering and production liaison; Harvey M. Merker, named director of inventory control and consultant on chemical and pharmaceutical manufacturing; and John E. Sweitzer, assigned to handle an entirely new organization as director of industrial engineering.

Meetings and Elections

The American Association of Spectrographers is planning a symposium on "Instrumental Methods of Analysis in the Non-Ferrous Industry," to be held in Chicago in May. Contributed papers will be welcomed. Address all inquiries to Robert Raisig, Chairman, Symposium Committee, c-o Apex Smelting Company, 2537 W. Taylor St., Chicago 12.

The British Association for the Advancement of Science announces the following appointments for 1952, which will include the annual meeting at Belfast (Sept. 3-10): president, A. V. Hill; general treasurer, M. G. Bennett; general secretaries, Richard Southwell and George Taylor; presidents of sections: A (Mathematics and Physics), A. M. Tyndall; B (Chemistry), W. Wardlaw; C (Geology), J. E. Richey; D (Zoology), A. D. Peacock; E (Geography), R. O. Buchanan; F (Economics), T. D. Jack; G (Engineering), Ben Lockspeiser; H (Anthropology and Archaeology), E. O. James; I (Physiology), R. C. Garry; J (Psychology), P. E. Vernon; K (Botany), Meirion Thomas; L (Education), A. L. Binns; M (Agriculture), N. C. Wright; Conference of Delegates of Corresponding Societies, J. A. S. Stendall. The prime minister of Northern Ireland and the lord mayor of Belfast will be patrons for the Belfast meeting, for which a local executive committee has been appointed under the chairmanship of Eric Ashby, vice-chancellor of Queen's University.

The Centennial of Engineering celebration to be observed in Chicago this year has appointed a 37-man board to direct the activities. Among the members are Benjamin F. Fairless, Gano Dunn, Herbert Hoover, Charles F. Kettering, David Sarnoff, James M. Todd, and Robert E. Wilson. Officers of the centennial are Lenox R. Lohr, president; Carlton S. Proctor, vice president; Titus G. LeClair, treasurer; and Charles F. Kettering, chairman of the Executive Committee. Frank W. Edwards, on loan from Illinois Institute of Technology, is general manager.

The sixth annual Eastern Colleges Science Conference will be held at Pennsylvania College for Women, Pittsburgh, Apr. 3-5. Three hundred Eastern colleges will be represented by 500 undergraduates. The theme will be "Science in an Industrial Era." The program will include tours, exhibits, lectures by specialists, and the presentation of undergraduate student papers and the exchange of student ideas.

The Ergonomics Research Society will hold a conference Mar. 25-28 at the College of Aeronautics, Cranfield, Bletchley, Bucks, Eng. Details of the program, which will cover the psychological, physiological, and industrial aspects of fatigue, may be obtained from K. F. H. Murrell, Room 1108, Queen Anne's Mansions, London, S. W. 1.

Papers to be read at the third annual meeting of the Histochemical Society, Hotel New Yorker, New York, Apr. 7-8, should be submitted to the secretary,

R. D. Lillie, National Institutes of Health, Bethesda 14, Md.

A meeting of the USA National Committee of the International Scientific Radio Union (URSI) and the Institute of Radio Engineers Professional Group on Antennas and Propagation will be held at the National Bureau of Standards, Washington, D. C., Apr. 21-24. Sessions will be concerned with the following topics: Radio Measurement Methods and Standards; Tropospheric Radio Propagation; Ionospheric Radio Propagation; Terrestrial Radio Noise; Radio Astronomy; Antennas and Waveguides; Radio Waves and Circuits; and Electronics. A preliminary program and advance registration forms will be available after Mar. 10. Further information concerning the meetings may be obtained from A. H. Waynick, Secretary, U. S. A. National Committee of URSI, Pennsylvania State College.

Miscellaneous

President Truman has announced establishment of a Commission on the Health Needs of the Nation. Its chairman is Paul B. Magnuson, orthopedic surgeon and former chief medical director of the Veterans Administration. The commission has 15 members whose assignment is "to make a critical study of our total health requirements, both immediate and long term, and recommend courses of action to meet these needs." The survey will embrace such broad topics as the current and prospective supply of professional personnel, public health requirements, geographical distribution of resources and facilities, medical research, adequacy of private and public programs designed to provide methods of financing medical care. The President's action has been sharply criticized by John W. Cline, Gunnar Gundersen, AMA trustee who was appointed president of the American Medical Association, and to the commission, has declined to serve.

The National Science Foundation had received 2800 applications for its graduate fellowships by the closing date, Jan. 7. Alaska, Hawaii, Puerto Rico, the District of Columbia, and all the 48 states were represented. About 400 fellows will be selected from this group, after screening and evaluation by the NRC fellowship panels. The foundation has appointed an advisory divisional Committee on Scientific Personnel and Education to help develop national policies in this field. The members include Joel H. Hildebrand, Frank J. Welch, Douglas Whitaker, Katherine McBride, and Harry A. Winne.

The private collection of marine barnacle specimens and data belonging to the late J. Paul Visscher, former professor and chairman of the Biology Department of Western Reserve University, has been given to the U. S. National Museum, Washington, D. C. Believed to be the largest and finest of its kind, the collection includes microscopic slides, bottled and dried specimens, manuscript notes, and the barnacle portion of Dr. Visscher's library. Dr. Visscher died Feb. 11, 1950.