Why a Coulachron Analyzer?

SPEED: 30 seconds or less for each analysis
SAMPLES: in microliters
ANALYSES: more than 120 different ions and compounds
STANDARDS: seldom required
READOUT: digital, in microequivalents
ACCURACY: for most analyses, better than 0.5%

a new instrument that provides fast, easy, economical analysis ... automatically

With a remarkable new instrument, the Coulachron, you can now titrate for more than 120 different ions and compounds—in seconds—without standard solutions—using micro samples—automatically! The Coulachron generates its own titrants, titrates to any selected potentiometric or amperometric end point, and reads out directly in microequivalents on a digital counter.

The basic Coulachron features the simplicity of plug-in programming for specific analyses. In addition, the separate Research Panel substitutes for the program plugs to let you adjust each variable independently. With the Panel, you can develop your own analyses, modify standard procedures, follow titrations on indicating meters and measure electrode voltages.

You can do all kinds of oxidation-reduction, precipitation and complex-formation titrations with the Coulachron and Research Panel. Generate titrants or add them from external burets, as you choose. Most analyses take less than 30 seconds, require only microliters of sample, need no calibration standards, and are accuracy-limited only by your sample pipetting technique.

Get the full facts on automating your analytical procedures with the Coulachron. Write:

ANALCO

CANAL INDUSTRIAL CORPORATION
Dept. E-23 4935 Cordell Avenue
Bethesda, Maryland 20014 / (301) 656-2333

Sales and Service Offices in: • Boston • Houston • New York • Seattle • Chicago • Los Angeles • Pittsburgh • Washington, D. C. • Cincinnati • Memphis • St. Louis • Toronto • Cleveland • Minneapolis • San Francisco

26 FEBRUARY 1965
MECHANISMS OF HARD TISSUE DESTRUCTION

Editor: Reidar F. Sognnaes, Dean, School of Dentistry, Center for the Health Sciences, University of California at Los Angeles

AAAS Symposium Volume No. 75, 1963. 776 pages, 430 illus., one color plate, references, indexes. $13. AAAS members' cash orders, $11.

Contents

C. M. Yonge: Rock-Boring Organisms
T. F. Goreau and W. D. Hartman: Boring Sponges as Controlling Factors in the Formation and Maintenance of Coral Reefs
M. R. Carriker, D. B. Scott and G. N. Martin, Jr.: Demineralization Mechanism of Boring Gastropods
R. F. Sognnaes: Dental Hard Tissue Destruction with Special Reference to Idiopathic Erosions
C. R. Barnicoat: Attrition of the Hypsodont Tooth
A. I. Darling: Microstructural Changes in Early Dental Caries
E. Johansen: Ultrastructural and Chemical Observations on Dental Caries
J. A. Gray and M. D. Francis: Physical Chemistry of Enamel Dissolution
P. H. Keyes and H. V. Jordan: Factors Influencing the Initiation, Transmission, and Inhibition of Dental Caries
W. V. Mayer and S. Bernick: Effect of Hibernation on Tooth Structure and Dental Caries
I. Reichborn-Kjennerud: Dento-Alveolar Resorption in Periodontal Disorders
S. N. Bhaskar: Bone Remodeling during Dental Eruption and Shedding
R. J. Goss: The Deciduous Nature of Deer Antlers
F. C. McLean and R. E. Rowland: Internal Remodeling of Compact Bone
M. R. Urist, N. S. MacDonald, M. J. Moss and W. A. Skoog: Rarefying Disease of the Skeleton: Observations Dealing with Aged and Dead Bone in Patients with Osteoporosis
J. Jowsey: Microradiography of Bone Resorption
W. V. Young: Histophysical Studies on Bone Cells and Bone Resorption
N. M. Hancox and B. Boothroyd: Structure-Function Relationships in the Osteoclast
J. T. Irving and C. S. Handelman: Bone Destruction by Multinucleated Giant Cells
G. Nichols, Jr.: In vitro Studies of Bone Resorptive Mechanisms
B. K. Forscher and D. V. Cohn: In vitro Carbohydrate Metabolism of Bone: Effect of Treatment of Intact Animal with Parathyroid Extract
C. M. Dowse, M. W. Newman, K. Lane and W. F. Neuman: Metabolic Action of Parathyroid Hormone on Rat Calvaria
P. Goldhaber: Some Chemical Factors Influencing Bone Resorption in Tissue Culture
G. N. Jenkins and C. Dawes: The Possible Role of Chelation in Decalcification of Biological Systems
C. M. Lapiere and J. Gross: Animal Collagenase and Collagen Metabolism

British Agents: Bailey Bros. & Swinfen, Ltd., Warner House, 48 Upper Thames Street, London E.C.4

American Association for the Advancement of Science
1515 Massachusetts Avenue, NW
Washington, D.C. 20005

CHIEF CLINICAL MICROBIOLOGIST

* Philadelphia General Hospital

SALARY OPEN

Requires a doctorate in microbiology and five years postdoctorate experience in medical microbiology, including three years in a supervisory capacity.

CHIEF CLINICAL CHEMIST

* Philadelphia General Hospital

SALARY $13,156–$14,374

Requires a doctor's degree in biochemistry or physiological chemistry and five years postdoctorate experience in clinical chemistry involving clinical chemical analysis, interpretation and research, including three years supervising such activities.

Philadelphia General Hospital, the nation's 6th largest hospital, is closely affiliated with five area medical schools and has over 30,000 admissions and newborns and over 350,000 out-patients and emergency visits each year. A total of over $5,000,000 has been committed for research at P.G.H. during the next five years. Opportunities for research will be available for both these laboratory directors.

TOXICOLOGIST

* Philadelphia Medical Examiner's Office

SALARY $9,672–$11,526

Requires a doctor's degree in the physical, medical or biological sciences including courses or experience in toxicology or pharmacology and three years recent experience in chemical analysis utilizing advanced techniques, performance of analysis and interpretation of results.

The Medical Examiner's Office is responsible for investigating all deaths of an indeterminable nature which occur in a city of 2 million. The toxicologist will assist the chief toxicologist and supervise the laboratory which receives about 6,000 toxicology requests a year.

All applicants must be United States Citizens. Excellent Fringe Benefits. Send detailed resume to

JOSEPH GOLDBERGER
Director of Recruiting

500 Municipal Services Bldg.
Philadelphia, Pa. 19107
Classified: Positions Wanted, 25c per word, minimum 25. Use of Box Number counts as 10 additional words. Payment in advance is required. For additional copies, see box number.

Display: Positions Open. Rates listed below. Use box number. Rates net. No agency commission allowed for ads under 4 inches. No cash discount. Minimum ad: 1 inch. Ad size over 1 inch will be billed to the nearest quarter inch. Ads must reach SCIENCE 2 weeks before issue date (Friday of each week).

For proofs on display ads, copy must reach SCIENCE 4 weeks before date of issue (Friday of each week).

10c per word. Replies to blind ads should be addressed as follows:

Box (give number)

SCIENCE

1515 Massachusetts Ave., N.W.

Washington, D.C. 20005

Positions Wanted

Air Hygiene-Physiologist. Teaching/research position desired. Box 75, SCIENCE.

Anatomist. Associate professor, medical school, long experience all branches, seeks short-term teaching position beginning September. Box 36, SCIENCE.

Electrical Engineering summer position desired. M.I.T. junior. Instrumentation, circuits, high-speed power systems; strain improvement; fer- mentations. Research institute/university. Box 66, SCIENCE.

Microbiologist, Ph.D. University of Illinois, 1963, seeks research and/or teaching in microbiology or sanitary engineering on the West Coast. Box 76, SCIENCE.


Ph.D. Soil Science (fertility), 1953, seeks academic or post-doctoral position in U.S. or Canada. Box 78, SCIENCE.

Physiological Psychologist, Ph.D. Research and teaching. Box 77, SCIENCE.

Physiologist-Zoologist, Ph.D. Interests in mammalian, endocrine, general physiology, radio- biology; university-college teaching, research. Experienced. Box 63, SCIENCE.

Physiologist, Ph.D., comparative electrophysiology, postdoctoral fellowship; available for research appointment. (b) Organic Chemist Ph.D., directed research and synthesis of new drug products; seeks administrative industrial position. Write Woodward Medical Personnel Bureau, 185 North Wabash Ave., Chicago 2, Ill. 60601.

Research Assistant, half-time, New York. Experience includes scientific editing, translation, drafting. Box 69, SCIENCE.

Rheologist-Biologist, with heat transfer experience. Active in analytical chemistry, cell physiology, and rheology. Seeking new position. Box 46, SCIENCE.

Translactor, B.S. Chem. German-English. Prompt service. Box 74, SCIENCE. 3/5

Virologist Ph.D., expects to graduate in August 1965. Experience in biochemical alterations in tissue culture due to virus infection. Seeks teaching and/or research position. Box 68, SCIENCE.
PHARMACOLOGY

Applications are invited for US citizens for fellowships in Steroid Research. Postdoctoral, $6000 plus dependent allowance. Predoctoral, $3600. Write Dr. D. S. Layne, Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts, or Dr. K. B. Eik-Nes, Department of Biochemistry, College of Medicine, University of Utah, Salt Lake City.

The Market Place

BIOMEDICAL ENGINEERING

B.S. in electrical engineering or physics with M.S. in biomedical engineering or equivalent. Experience in the acquisition, development, and use of electronic instrumentation to facilitate clinical laboratory procedure. A record of technical assistance in the acquisition, development, and use of electronic instrumentation to facilitate clinical laboratory procedure. Proficiency in the use of computers is desirable. Please send complete résumé to:

TECHNICAL EMPLOYMENT COORDINATOR
Kalamazoo, Michigan

PHARMACOL-OGY

Applications are invited for PREDOCTORAL TRAINEES IN BIOCHEMISTRY. The trainees will be awarded stipends for one year. Normal 3-year Ph.D. degree is required. Applications will be accepted until March 31, 1965.

Physiologist—Ph.D.

Applications will be accepted from US citizens for fellowships in Steroid Research. Predoctoral, $6000 plus dependent allowance. Predoctoral, $3600. Write to:

Box 59, SCIENCE

FELLOWSHIPS

Applications are invited for US citizens for fellowships in Steroid Research. Postdoctoral, $6000 plus dependent allowance. Predoctoral, $3600. Write Dr. D. S. Layne, Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts, or Dr. K. B. Eik-Nes, Department of Biochemistry, College of Medicine, University of Utah, Salt Lake City.

TRAINEESHIPS FOR GRADUATE WORK IN PHARMACOLOGY

A 4-year program of course work and research training leading to the Ph.D. degree is offered. US citizens only. Research in fundamental mechanisms of drug action. Starting annual stipend $2400 plus $500 per dependent. Early application for September 1965 strongly recommended. Write to:

Department of Pharmacology, School of Medicine, State Univ. of New York at Buffalo, 122 Canep Halil, Buffalo, N.Y. 14214.

NEW ZEALAND

DEPARTMENT OF AGRICULTURE

SENIOR RESEARCH FELLOWSHIPS

Applications are invited for awards to be taken up in 1965 for research at various departmental research centers at the direction of the Director, Agricultural Research. Facilities and equipment are available for all scientific disciplines applicable to soil science, plant and animal nutrition, agriculture, dairying, horticulture, forestry, entomology, parasitology, genetics, biochemistry, animal physiology, dairy science and veterinary science. Laboratories and research stations are in various parts of the country and are capable of being used as a base for research. Applicants should be prepared to supply their own funds in order to meet the cost of travel to New Zealand. The stipend will be $6000 a year. Applications are invited from all citizens of countries where English is the normal language. A knowledge of the principles of statistical evaluation of biological data is highly desirable.

biomedical engineering

Expanding R&D activities have made several research openings available for Ph.D. or M.S. engineers trained in biomedical engineering. Experience in the planning, initiating and supervising of research is desirable. Please send résumé to:


The Department of Psychiatry in the Yale University School of Medicine is offering a predoctoral fellowship under a USPHS grant to provide intensive experience in developing research competence in areas where psychiatric research could lead to investigative careers in mental health. The candidate may choose research in any one of the areas (pharmacology, physiology, neurology) plus specific areas in psychology, and so forth; training in clinical psychiatry is provided when requested. Applicant will be accepted from candidates with the M.D. or Ph.D. degree. Non-medical students (from psychology, education, etc.) will be accepted from candidates with interest in psychotherapy (Ph.D.) or physician assistant (M.D.). Fellowship is for one or two years, with renewal for a second year possible. Further questions may be addressed to:

Dr. M. E. Olin, Assistant Director, Biological Science Program, Department of Psychology, Yale University, 333 Cedar Street, New Haven, Connecticut.

university of the west indies

Lecturer or Assistant Lecturer in Pharmacology

Applications are invited for the post of Lecturer or Assistant Lecturer in Pharmacology. The duties of the post will be to instruct students in pharmacology, conduct research at degree level of the University of the West Indies, and to do research in pharmacology. Duties to be assumed 1 October 1965.

Salary: Assistant Lecturer (medically qualified) £2290 plus £200 for research or £2050 plus £150 allowance; Lecturer (medically qualified) £2150 to £2300 plus £200 for research or £2000 plus £150 allowance. Child allowance (limited to three children) £150 for the first, £100 for the second, and £50 for the third child. F.S.S.U. housing allowance of 10 percent of salary, or, if available, unemployment benefit to cover University at 10 percent of salary. Up to five full passages of leave for medical purposes and study leave (once every three years). Appointment for 3 years is the first instance.

Detailed applications (10 copies) giving full particulars of qualifications and experience, date of birth, etc., should be sent to:

The Registrar, University of the West Indies, Kingston 7, Jamaica, and by all other persons to the Secretary to the Senate Committee on Higher Education Overseas, University of London, Senate House, London W.C. 1. Further particulars may be obtained similarly.
THE SCIENCE OF PRODUCTION. When producing advanced, complex communications equipment on a vast scale to exact standards, science is needed on the production line as well as in the laboratory. That's why Western Electric engineers took the scientific approach in developing a new production planning and control system in several of its multi-product plants. A computerized file contains details of all equipment and materials used by a plant. Requirements for a product are put on punched tape or cards and fed into the computer which converts them into efficient control information: it predicts the time needed for every aspect of manufacture, schedules equipment, allocates manpower, and processes all documents. By continually improving manufacturing methods, Western Electric engineers and production people help the Bell telephone companies, coast-to-coast, bring America the finest in communications at low cost.
when two persons can see the same magnified image simultaneously through a Dual Viewing Microstar. Each viewer enjoys the same superb flat field, high-quality image that is available only with the AO Series 10 Microstar. An illuminated, transparent arrow is superimposed on the field of view. It can be freely positioned to pinpoint any minute detail for both observers. Applications are limitless. It's specially suited for consultations, training and advanced teaching because it offers simultaneous viewing and critical resolution that is impossible to achieve by projection methods. The Dual Viewing Microstar gives you a new method of effective communication.

two heads really are better than one...

AMERICAN OPTICAL COMPANY
INSTRUMENT DIVISION • BUFFALO, NEW YORK 14215

Dept. N4
Gentlemen: Please send complete information on the AO Dual Viewing Microstar.
Name
Address
City State Zip Code