

Placement Personnel

POSITIONS WANTED

Aquatic Ecologist. Ph.D., 11 years' experience in team and individual ecological and radioecological research. Publications. Desires research or research/academic position. Western United States. Box 287, SCIENCE. X

Bioengineer. M.S., extensive life science instrumentation experience, desires creative senior research/development position. Box 273, SCIENCE. X

Endocrinologist. Ph.D. Biochemistry and physiology, postdoctoral experience, 5 years in institutional research: steroids, growth hormone, developmental biology. Seeks teaching-research in university. Box 281, SCIENCE. 7/17

Infectious Diseases. M.D. Twenty years' experience. Desires new horizon in academic environment. Numerous publications, teaching award, extensive experience with administration and patient care. Box 288, SCIENCE. X

Immunologist. Ph.D. Veterinary graduate. Teaching and research experience in microbiology and immunology. Available Fall 1970. Box 289, SCIENCE. X

M.S. experienced in life and environmental sciences seeks association with small production enterprise to share development of timely instrumentation. Box 291, SCIENCE. 7/31

POSITIONS OPEN

BIOCHEMIST-MICROBIOLOGIST, Ph.D.

An immediate opening is available in a special viral oncology program seeking to establish novel model systems for the evaluation of antitumor drugs. Previous research experience with oncogenic viruses is desirable. Submit résumé and reprints of relevant publications to **Dr. J. F. Niblack, Virology Department, Pfizer Inc., Groton, Connecticut 06340.**

BIOCHEMIST OR BIOLOGIST

Recent Ph.D. or equivalent, with background and interest in metabolism and enzymes. Grant position. Apply to:

Dr. E. Van Handel
Entomological Research Center
Florida State Division of Health
Post Office Box 308
Vero Beach, Florida 32960

BIOLOGICAL OCEANOGRAPHER: Teaching and research, with major responsibility for ongoing oceanic sampling programs. Ph.D., rank assistant professor, salary according to qualifications. Preference for individual with interests in ecology and distribution of oceanic zooplankton and/or midwater crustaceans or cephalopods. Apply to **Dr. Bernard C. Abbott, Department of Biological Sciences, University of Southern California, Los Angeles, California 90007.**

COLLEGE TEACHERS WANTED M.S. or Ph.D. NATIONWIDE SEPT. POSITIONS

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ENGINEERING	PSYCHOLOGY
GEOLOGY	OTHER DISCIPLINES

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POSITIONS OPEN

CHAIRMAN, DEPARTMENT OF BIOLOGY THE UNIVERSITY OF NEW BRUNSWICK FREDERICTON, N.B., CANADA

Applications are invited for the position of Chairman of the department which will be a renewable term appointment. At present the department consists of a faculty of 15 and 35 graduate students. Candidates should have demonstrated research competence in a field of biology and should have experience and an active interest in undergraduate and graduate teaching with appropriate administrative experience. Deadline for receipt of applications is 1 October 1970. The University reserves the right to make an appointment at any time. The appointment will become effective not later than 1 July 1971. Salary negotiable.

Send applications, curriculum vitae and names of three referees to **Dr. Mervyn Franklin, Office of the Dean, Faculty of Science, The University of New Brunswick, Fredericton, New Brunswick, Canada.**

TERRESTRIAL ECOLOGIST

Faculty position involving undergraduate and graduate teaching and research in the realm of terrestrial ecology. Applicant must have the ability to communicate with students from all faculties who are concerned with the role of ecology in society; with specific reference to central Canada. Initial appointment will be made at the Associate Professor level (1970-71 minimum of \$14,400) for an applicant with a record of at least 5 years of appropriate experience beyond the doctorate. Curriculum vitae and the names of three referees should be sent to:

H. B. N. Hynes, Chairman, Department of Biology, University of Waterloo, Waterloo, Ontario, Canada.

HEAD LITERATURE SECTION

Head Literature Section created due to departmental expansion. To supervise a group responsible for indexing and searching the biomedical literature, preparation of bibliographies, production of current awareness bulletins, and related responsibilities. Ph.D. chemist or biologist with related experience required. Please send résumé of training, experience and salary expectations to: **Professional Employment, BRISTOL LABORATORIES, Division of Bristol-Meyers Company, P. O. Box 657, Syracuse, New York 13201.**

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Ph. D. Microbiologist

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POSITIONS OPEN

PLANT BIOLOGIST

Challenging position, with opportunity to designate key assistants, available for a senior person with Ph.D. in a botanical science, preferably plant physiology, to conduct and supervise interdisciplinary research in agricultural biology and environmental biology. Strong experience in either area required; administrative experience and promotional ability highly desirable. Position is located in our new modern facility at Irvine, adjacent to Newport Beach, Calif. Please submit résumé to:

Mr. H. E. Snider

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PROTEIN CHEMIST

For Basic Research on Structure. Should be fully trained. Salary dependent upon qualifications. Position available immediately. Please send résumé.

Box 290, SCIENCE

REPRODUCTIVE PHYSIOLOGIST. Applicants are invited for this position of staff scientist in the Department of Reproductive Physiology of the Institute of Hormone Biology, Syntex Research. Position requires Ph.D. with 1 to 5 years' broad experience in reproductive physiology, preferably with a special interest in neuroendocrinology. Radioimmunoassay techniques desirable. The successful candidate should be suited to working within an existing research team and to taking advantage of the multidisciplinary research support available in extensively equipped research facilities. Résumés may be submitted in confidence to **L. Koval, 3401 Hillview Avenue, Palo Alto, Calif. 94304.** An equal opportunity employer.

VETERINARY PATHOLOGIST

Faculty position: Teaching and Service Responsibilities. Board certification or equivalent. Rank and salary negotiable. Inquire to: **Dr. John McGrath, Laboratory of Pathology, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, 19104.**

GRADUATE STUDY

Postdoctoral Traineeships (biochemical background) available July 1970. Starting Fall acceptable. Send curriculum vitae to

Milton R. Okun, M.D.
Department of Dermatology
Tufts-New England Medical Center
185 Harrison Ave.
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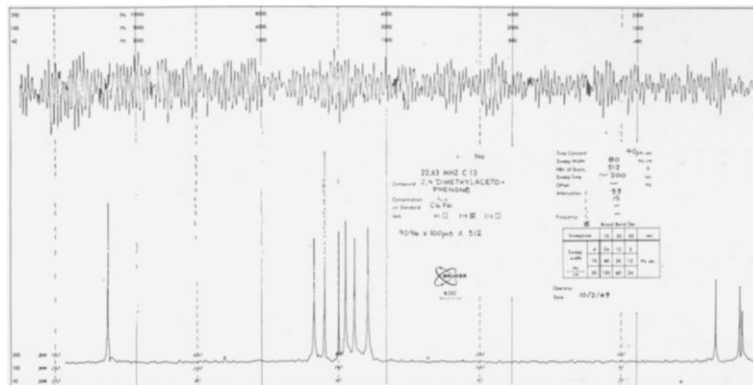
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Signal Averaging... Principles and Practices *NMR Fourier Spectroscopy*

Number 7 of a Series

In Number 3 of this series we discussed how and why Fourier transform techniques are used in infrared spectroscopy and said that the same principles could be extended to Nuclear Magnetic Resonance (NMR) spectroscopy. We recently applied our 1070 System to a Bruker Scientific, Inc. (Elmsford, N.Y.) spec-



trometer and the above ^{13}C interferogram and spectrum are early results of this joint effort. The interferogram is only the first 1024 data points of a 4096 point free induction signal and is the average of 512 sweeps taking a total of approximately 200 seconds to accumulate. The Fourier transformed high resolution spectrum is shown below it. The equivalent sweep width is 5 KHz.

The significance of this technique lies in the time savings that can be achieved and the fact that this time savings can be put to good use in improving sensitivity or signal-to-noise ratio. The above spectrum of naturally low abundance ^{13}C , if recorded by conventional (CW) NMR techniques, would have taken 10 to 12 hours instead of 3 to 4 minutes.

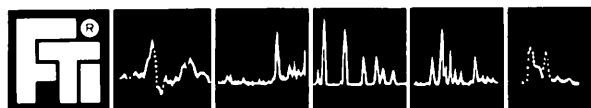
While these data demonstrate approximately a 200:1 time savings, much longer savings are theoretically possible. Ernst and Anderson¹ have shown that the theoretical time reduction increases in proportion to the spectral resolution. The relaxation times (T_1) of the nuclear spin systems have been considered a limiting factor in approaching these theoretical values. However, recent experiments² indicate that the T_1 limitation can be overcome by newly developed techniques and that savings in the order of 10,000:1 may soon be practical. If part of these time savings were used for sensitivity improvement through signal averaging, signal-to-noise ratio improvements of one to two orders of magnitude could be achieved.

Interested? Why not call or write to arrange to see a Fabri-Tek 1070 System.

References:

1. R. R. Ernst and W. A. Anderson, *Rev. Sci. Instr.*, Vol. 37, 93 (1966).
2. E. D. Becker, J. A. Ferretti, and T. C. Farrar, *J. Am. Chem. Soc.* Vol. 91, 27 (1969).

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