dered subsequence of DNA that two DNA molecules have in common. If the two DNA molecules consist of \( m \) nucleotides and \( n \) nucleotides, respectively, an algorithm can find their longest common ordered subsequence in \( m \) times \( n \) steps. However, Peter Wiener of the Rand Corporation in Santa Monica, California, has now found an algorithm that can perform this operation in \( m + n \) steps, a considerable saving if \( m \) and \( n \) are large.

Wiener made two assumptions that enabled him to find an algorithm consisting of \( m + n \) steps. Neither assumption was included in the algorithm that requires \( mn \) steps. First, Wiener assumed that the algorithm must find only contiguous subsequences of DNA. (Because the genetic code is translated from contiguous sequences, it is not acceptable to choose a subsequence consisting of DNA nucleotides that are separated from each other on the DNA strand.) Second, Wiener assumed that the algorithm would be run on a random access computer—a computer with a large core memory that enables it to quickly recall information that is asked for by name. Computers with auxiliary memories, such as tape or drum memories, recall information much more slowly. Wiener's solution is thus extremely helpful to those who need this special case of the algorithm for research on molecular evolution and who have random access computers. It does not aid those who need the more general algorithm or who have more restricted computers. Although research on special cases usually precedes the development of unifying theories, unifying theories have not as yet been proposed for problems involving computer algorithms.

Ronald Graham of Bell Laboratories in Murray Hill, New Jersey, believes that the lack of combinatorial theories is due in part to the fact that combinatorics has traditionally not been considered a subject unto itself. Only recently, he says, have researchers emphasized the unity of combinatorics. Moreover, the large number of as yet unsolved problems makes it difficult to build theories. However, the recent rapid development of combinatorics is encouraging to those who, like Rota, believe that combinatorial theories are necessary to the future of the mathematical, physical, and life sciences.

—GINA BARI KOLATA

RESEARCH NEWS

(Continued from page 840)

PERSONNEL PLACEMENT

It is requested that only those employers who will not discriminate on the basis of race, sex, religion, color, or national origin submit positions.

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POSITIONS WANTED

Biochemist, Ph.D. Experienced in heart and cancer research. With background in transport, nucleic acid metabolism, oxidative phosphorylation, microsomal drug-metabolizing enzymes, cyclic nucleotides, teaching research, or both. Box 107, SCIENCE.


Biochemist-Microbiologist, Ph.D. (biochemistry). Six years of teaching (graduate and medical), research, guidance, administrative experience, publications in biochemical pharmacology, microbial pathobiology, antibiotics, nucleic acids, carbohydrates, microorganisms. Teaching, or research- teaching- administration. Box 90, SCIENCE.

Electron Microscopist, M.S., with E.M. research, teaching, and experience. Seeks position in research laboratory. Desires position in these areas and laboratory management. Donald Bechtel, Department of Botany and Plant Pathology, Iowa State University, Ames, Iowa 50010.

Experimental Pathologist, Ph.D. 1969; 3½ years in pharmacology department. Experience in immunology, cell culture, electron microscopy, toxicology, seeks challenging industrial position. Box 109, SCIENCE.

Fermentation Biochemist, Ph.D. 1967; 3 years of pilot plant research, 4 years' selling experience of investment properties. Seeks pharmaceutical or medical research. Seeking present residence, multilingual. Box 689, Huntington Beach, California 92648.

Geneticist Biostatistician, Ph.D. Experienced, effective versatile teacher with research and administrative experience; presently associate professor at major university in small, liberal arts college. Box 110, SCIENCE.

Genetically trained Biostatistician, Ph.D. 1965. Two years of postdoctoral training; 38. Outstanding record in teaching. Seeking a position in the University of Vermont, Burlington, Vermont. Box 111, SCIENCE.

BROADLY TRAINED GENETICIST, Ph.D. 1961. Basic knowledge of molecular biology, biochemistry, and genetics. Experience teaching and research in the area. Seeking an assistant professor position in a university of the southeast. Box 112, SCIENCE.

Biostatistician, Ph.D. 1972. Expert in design and implementation of experiments, statistical analysis of data, and formulation of policy. Desires research and teaching position. Box 113, SCIENCE.

ASSISTANT PROFESSOR OF MEDICINE

A position will be available 1 July 1974 in Wayne State University's School of Medicine for M.D., and/or Ph.D., and/or M.S. in medicine or related sciences. Applicants should have a good background in one of the biomedical sciences and experience in research in the area of pharmacology. Responsibilities include clinical teaching and research. Applications should be submitted to: Dr. V. K. Vailikievicius, Professor of Pharmacology, Grace Hospital, 4100 John R Street, Detroit, Michigan 48202.
MEMORIAL UNIVERSITY OF NEWFOUNDLAND

ASSISTANT PROFESSOR IN BIOCHEMISTRY

Applications are invited for the post of Assistant Professor in the Department of Biochemistry (Head Designate, Dr. C. C. Bigelow), to take effect from 1 September 1974 or as soon thereafter as possible. The Department teaches undergraduates in the Faculty of Science, and has an active postgraduate research and teaching program. The successful applicant will be required to take part in the teaching duties of the Department, and to develop his own research program. The salary is negotiable, depending on experience.

Applications, including a curriculum vitae and the names of three referees, should be sent to Dr. E. A. Barnsley, Department of Biochemistry, Memorial University of Newfoundland, St. John's, Newfoundland, Canada, to reach him not later than 31 March.

ASSISTANT PROFESSOR OF ONCOLOGY

Three 1-year positions will be available 1 July 1974 in the School of Medicine of Wayne State University, for holders of the M.D. degree, Board certified in Internal Medicine, qualified or certified in the subspecialty of oncology. Specialists are required in the following areas:

1) Breast cancer management and experience in estrogen metabolism studies.
2) Experience in leukopheresis in conjunction with IBM Cell Separator, white cell typing, and leukoagglutinins.
3) Tumor immunologist with laboratory experience in blocking antibody determination.

Responsibilities will include teaching, research, and related clinical care. Applications with curriculum vitae, bibliography, and any other pertinent information, should be sent to: Dr. V. K. Valtiner, Chairman, Department of Oncology, Wayne State University School of Medicine, 540 East Canfield, Detroit, Michigan 48201.

ASSISTANT PROFESSOR—PLANT ECOLOGY

Applications are invited for a new position in Plant Ecology, Ph.D. required. Duties to begin in September 1974. Primary teaching responsibilities will be to develop an integrated course in ecology and to teach an advanced course in field of special interest. People with a strong interest in research are especially invited to apply. Send curriculum vitae and three letters of reference by 1 April 1974 to Dr. C. F. Herriott, Department of Biology, State University of New York at Buffalo, Buffalo, New York 14214.

An Equal Opportunity Employer/Affirmative Action Employer

ASSISTANT PROFESSOR/PULMONARY

University of California, San Diego. Appointment at the Assistant Professor level for a physician who has been actively trained in pulmonary physiology and medicine and who has published fundamental research in areas relating immunology to pulmonary disease. Will have responsibilities in teaching clinical pulmonary medicine and general internal medicine patient care in these areas; independent research in pulmonary immunology. Please forward curriculum vitae and three letters of reference by 1 March 1974. Respond to Dr. Howard B. Ranney, Chairman, Department of Medicine, University Hospital, 252 West Dickinson Street, San Diego, Calif. 92163.

An Equal Opportunity/Affirmative Action Employer

ASSOCIATE CHIEF OF STAFF FOR RESEARCH, San Diego Veterans Administration Hospital, and Faculty Member, University of California, San Diego School of Medicine, La Jolla, Calif. Applications are sought for a physician with the necessary scientific and administrative background to coordinate the further development of the research program of this hospital. The candidate should be eligible for a senior academic appointment at the University of California, San Diego School of Medicine, and will be encouraged to participate in all of the affairs of his particular department in the medical school and its hospitals.

The DEPARTMENT OF BIOLOGY at Hampden-Sydney College has an opening for either an Invertebrate Biologist or a Microbiologist. Experience in Histology and/or Parasitology is desirable. Candidates should have the Ph.D. degree and preferably a few years of teaching behind them. Hampden-Sydney College is a small (700 students), liberal arts college for men in southside Virginia. The emphasis is on undergraduate teaching. The sciences are housed in a new building with excellent teaching and research facilities. Interested candidates should contact Dr. T. H. Turner, Box 197, Hampden-Sydney, Virginia 23943.