

But that factor presents only a problem of intensity. The basic factor involved on the disadvantage side of concentration of ownership is its effect on the rate of investment. Here we return to the y and v , and E and k of the equations derived from the relations of species. In this case y would refer to total invested capital, v to the capacity of the economy to utilize capital, and E and k to the growth exponentials of those two quantities.³ E is then the rate of net investment, as a fraction of total invested capital; and k is the rate of growth in the capacity of the economy to utilize capital, as a fraction of that capacity. Such capacity depends upon manpower, natural resources, and, as a dimension of both manpower and natural resources, the level of technology.

E is in fact distinct from k and, without regard to the fluctuations of the business cycle, may not be taken for granted. The rate of investment is in part a function of the supply of investment funds, and that supply is made up in large part of earnings. The extent to which earnings form a source of investment funds depends geometrically upon the level of individual incomes; for investment funds are not merely proportionate to income, but come more readily out of the higher brackets. The level of individual incomes, in turn, depends not only on total income; it depends in part also upon the distribution of earnings, and the distribution of earnings depends to a considerable extent upon the distribution of owner-

³ The y and v thus used are the same precisely as the C and C_0 , respectively, previously used in the same connection in *Invisible Barrier*, by George T. Altman (Los Angeles: DeVorss & Co., Chap. 7 [1949]).

ship. In summary, the higher the inequality of ownership, and the higher the level of total production, the greater is the supply of investment funds, as a *percentage of total production*, and the higher therefore is the value of E .

There is one additional point. Over a short period the inequality of earnings is a function, not only of the inequality of ownership, but of the level of total production. Although there is no evidence that on a secular basis there is any relation between the inequality of income and the level of total production, there is some evidence of such a relation in the short run, and it is an element of aggravation that must be considered.

At least this factor of the distribution of income, over both the long and the short periods, is a factor directly influencing E without corresponding effect on k . True, if there is a greater supply of investment funds, and investors as a result will take less compensation for its use, more capital can be used, so that indirectly k is also affected. But actual capital is in the main physical, and the efficiency of its use slopes rapidly either way from an optimum total of capital in use. As a result k is a delicate instrument. If there were no time gap between E and k , a continuous balance between them would no doubt obtain. But there is such a time gap—the length of the supply process, which separates investment from its fruition. We have, then, precisely the same situation here as we have in the relation of interdependent species above described. The cyclical character of production is not merely a result. It is a mathematically necessary result.

News and Notes

Scientists in the News

Robert J. Anderson has left the Light Metals Division of the National Production Authority, Washington, and has joined the Southwest Research Institute, San Antonio.

E. Dwight Barnett, director of Harper Hospital in Detroit since 1946, has been appointed first director of Columbia University's Institute of Administrative Medicine, which will begin active operation this month.

Otto A. Bessey has accepted appointment as professor of biochemistry and nutrition, and chairman of the department at the University of Texas Medical Branch, Galveston. Professor Bessey is serving in a similar position at the University of Illinois Medical Center, Chicago.

Francis G. Blake, wartime adviser to the President on problems of epidemic disease and former dean of the Yale Medical School, has been named civilian technical director of medical research in the Office of the Army Surgeon General. Dr. Blake will serve as expert consultant to **John R. Wood**, chairman of the

Army Medical Research and Development Board, in the evaluation of current and proposed research projects conducted by Army medical installations and 81 cooperating civilian institutions. He will be responsible for ensuring close coordination between the Army's present \$10,079,000 medical research effort and similar programs sponsored by the other armed forces and civilian federal agencies. Now on leave of absence from Yale, Dr. Blake retired in 1951 as chairman of the Committee on Medical Sciences of the RDB.

William F. Cassidy, Jr., has been elected president of Aircraft Radio Corporation succeeding **Lewis M. Hull**, who has become chairman of the board and remains as treasurer. Mr. Cassidy was previously vice president and general manager of Kearfott Manufacturing Co., of Newark, N. J. **Richard W. Seabury**, who has been chairman of the board of Aircraft Radio, is now chairman of the finance committee.

The National Research Council has appointed two new members to the Building Research Advisory Board: **Edmund Claxton**, director of research, Armstrong Cork Company; and **Mason C. Prichard**, special assistant, Office Chief of Engineers for Military Con-

struction, Department of the Army, and chairman, Building Research Activities Committee of the American Society of Civil Engineers.

Benjamin M. Duggar, of Lederle Laboratories, Pearl River, N. Y., who discovered aureomycin in 1948, was recently elected president of the Society of Industrial Microbiology.

Oscar Felsenfeld is on a six months' leave of absence from the Hektoen Institute for Medical Research, Chicago, to lead a party of six conducting research in salmonellosis and amebiasis in Jamaica, Mexico, Costa Rica, Colombia, Peru, and the Guianas. Two salmonella typing centers will be established during the survey. The expedition is sponsored by the Tropical Research Foundation.

T. H. Goodspeed, professor of botany and director of the Botanical Garden on the Berkeley campus of the University of California, is continuing his research on the character and distribution of the vegetation of western South America. This sixth South American expedition is being financed by the Rockefeller Foundation and by donations of funds to the university by a number of private individuals. On invitation from the Chilean government, Dr. Goodspeed will assist in the construction of a National Botanical Garden and Botanical Research Institute on a 450-acre tract near Valparaiso, Chile. **Paul C. Hutchison**, botanist of the university's Botanical Garden, and local collectors in South America will assist Dr. Goodspeed. Dr. Hutchison's participation is being financed by the Kendrick Fund for South American Botanical Investigation.

At the Cuban Academy of Sciences, **A. Edward A. Hudson**, of North Carolina State College, was recently decorated by Carlos Prio Socarras, President of the Republic of Cuba, with the National Order of Merit "Carlos J. Finlay" in the grade of Commander. **Henry Turkel**, of Detroit, and Dr. Hudson were also made honorary members of the Cuban Society of Public Health. Dr. Turkel was also made a corresponding member of the Cuban Society of Biology and Tropical Medicine.

An award of \$1,000 has been presented to **T. S. Jobson** by the Employees Suggestion Program of United Air Lines for his proposal to change the routing of DC-6 Mainliners leaving Portland, Ore., southbound under instrument conditions. Captain Jobson has been a United pilot for more than 18 years. His award was the largest made by the Employees Suggestion Program in 1951.

Eugene H. Kone, associate director of the Yale University News Bureau, has resigned to become vice president of Martin Wright and Associates, of New Haven, a New England firm specializing in employee, community, and public relations.

George R. La Rue, professor of zoology, University of Michigan, who will shortly be retired, is a visiting

investigator in the Zoological Division, Bureau of Animal Industry, Beltsville, Md.

George T. Lodge has been appointed chief clinical psychologist at the Veterans Administration Hospital, Lebanon, Pa. Dr. Lodge has been chief of the Psychology Section at Letterman Army Hospital in San Francisco for the past two years.

S. E. Luria, of the University of Illinois Bacteriology Department, has been invited by the Society of General Microbiology of England to speak at the annual meeting to be held next April in Oxford. His topic will be a report on "The Mechanism of Virus Multiplication." Professor Luria will also give a lecture at Oxford University, reporting on the work at Illinois on the mechanism and intermediate products of virus synthesis.

James H. Means, of MIT, was the only scientist among the four recipients of the prize awards of the Sidney Hillman Foundation, presented for newspaper and magazine reporting and for authorship of an outstanding novel. Dr. Means' articles supporting the British Labor Government's national health program and attacking the AMA's attitude on socialized medicine were judged prizeworthy by the award committee, consisting of Lewis Gannett, N. Y. *Herald Tribune* book editor; William L. Shirer; and Thomas L. Stokes.

W. E. K. Middleton, head, photometry and colorimetry section, Division of Physics, National Research Council of Canada, has been elected for a four-year term as a member of the Board of Directors of the Optical Society of America.

After 17 years of service, **Walter Mulford**, dean emeritus of the School of Forestry, University of California, has resigned as consulting editor for the "American Forestry" series, published by McGraw-Hill. Professor Mulford's duties have been assumed by his colleague **Henry J. Vaux**, associate professor of forestry at the University of California.

The National Farmers Union has announced that **Lord Boyd Orr**, recipient of the Nobel peace prize in 1949, has been named the winner of its annual award for outstanding service to agriculture. Lord Orr, first director-general of the Food and Agriculture Organization of the United Nations, will come to this country to receive the award at the union's golden anniversary convention in Dallas on Mar. 12.

The board of trustees of the New York School of Social Work, Columbia University, has announced the election of **Dwight R. G. Palmer**, board chairman and chief executive officer of the General Cable Corporation, as a school trustee.

Edwin G. Ramsdell, chief of staff and director of surgery at White Plains Hospital, has been given Columbia University's Lion Award in recognition of his "outstanding service to his country, community,

and to his university." He is a diplomate of the American Board of Surgery, a chevalier of the Legion d'Honneur, and holds the Croix de Guerre for his Army medical service in France in World War I.

Oscar S. Reeder, USAF (MC), has been named chief of the Medical Consultants Division for the Office of Air Force Surgeon General. He has directed orthopedic surgery at Valley Forge General Hospital, Pa.

D. G. Sopwith has been appointed director of mechanical engineering research in the Department of Scientific and Industrial Research (London), succeeding the late **G. A. Hankins**. Dr. Sopwith, who was made superintendent of the Engineering Division, National Physical Laboratory, DSIR, in 1948, has been acting director since Dr. Hankins' death in November 1950.

Francis J. Weiss has been appointed scientific consultant to the National Farmers Union. He was formerly special research consultant to the Sugar Research Foundation.

Two new life members have been elected to the Board of Trustees of the National Geographic Society—**William E. Wrather**, director of the U. S. Geological Survey and treasurer of the AAAS, and **H. Randolph Maddox**, president of the Chesapeake and Potomac Telephone Company, of the Bell System. Dr. Wrather fills the vacancy on the society's 24-man board created by the death last April of **Charles G. Dawes**, and Mr. Maddox fills the vacancy occasioned by the death in September of **Jesse R. Hildebrand**, senior assistant editor of the *National Geographic Magazine*.

Education

Adelphi College, Garden City, N. Y., in expanding its Chemistry Department to award the M.S. degree, has organized a seminar to extend throughout the first year of enrollment. Divided into two parts, the first half is devoted to outside speakers who will discuss the various social science issues in the natural sciences. The second half will be devoted to student participation in a central topic. James Beckerly, AEC director of classification, addressed the last meeting of the first seminar Jan. 17, on "Secrecy Problems in the Atomic Energy Project."

The **American College of Physicians** will sponsor the following postgraduate courses this spring at: Stanford University and the University of California (San Francisco), Feb. 25-29, Gastroenterology; Washington University, Mar. 3-7, Current Concepts of Allergy and Associated Disorders; Mar. 10-15, Cornell University and the New York Hospital, New York City, Diseases of the Blood Vessels; Mar. 17-22, Ohio State University, Clinical Medicine from the Hematologic Viewpoint; Apr. 14-18, University of Michigan, Internal Medicine; May 12-17, Massachusetts General Hospital, Boston, Electrocardiography; May 12-16, Hahnemann Medical College and Hospital

of Philadelphia, Trends and Newer Developments in Internal Medicine; June 2-7, University of Toronto, Physiological Basis for Internal Medicine. Where facilities are available, the courses will be open to nonmembers with adequate preliminary training, who should file applications in advance in order to be put on the waiting list.

Nassau Hospital, Mineola, N. Y., will develop new methods for the medical use of atomic energy in a pilot operation in collaboration with Brookhaven National Laboratory. Brookhaven will furnish radioactive material to the hospital and exchange information; later, temporary personnel exchanges for training in radioactive medicine techniques will be made.

The **National Geographic Society**, the Navy, and the **Air Force** will participate in an expedition to Khartoum, in the Anglo-Egyptian Sudan, to study the total eclipse of the sun occurring Feb. 25. George Van Biesbroeck, astronomer and physicist, of Yerkes Observatory, will direct the society's part of the project, Edward O. Hulburt, director of research of the Naval Research Laboratory, will make spectral studies for the Navy, and optical and radio measurements of the temperature of the sun's corona and chromosphere will be made for NRL under the direction of John P. Hagen. Scientists from the University of Colorado's High Altitude Observatory will also observe the eclipse.

Trustees of the **New York Zoological Society** have made an initial appropriation of \$5,000 to start a program of aid to European scientists working in the biological sciences. First supplies of American technical journals, specimens, and laboratory equipment will be sent abroad early this year, on the basis of a report made by Jocelyn Crane, zoologist, of the Department of Tropical Research, who visited 19 laboratories in Europe while attending the International Entomological Congress last fall. In April Fairfield Osborn, president of the society, will go to Europe for further investigation of the actual needs and work being done. Ross F. Nigrellie, aquarium pathologist, is chairman of the group that will handle the European contacts.

Applications for admission to the 1952-53 session of the **Oak Ridge School of Reactor Technology** must be filed by *Mar. 1*, after which the AEC's Committee of Admission will select approximately 70 students from two categories: A, recent graduates from universities, and, B, representatives from industry and government agencies, all of whom must have a B.S. or higher degree. For additional information write to the school at Box P, Oak Ridge, Tenn.

The first Meyer Bodansky Lectures at the **University of Texas Medical Branch**, Galveston, will be given Feb. 13 by Carl F. and Gerty T. Cori, 1947 Nobel prize winners. The lectureship was established by a group of Galveston businessmen in memory of the late professor of pathological chemistry.

Grants and Fellowships

Grants totaling \$1,200,000 have been made by the **Carnegie Foundation for the Advancement of Teaching** to various influential and strategically located Southern institutions for the development of high-quality graduate and research programs, in an effort to solve the critical problem of personnel. Among the universities are Duke, Emory, North Carolina, Tulane, and Vanderbilt. Funds for the five-year program will be used to supplement professional salaries and stipends to selected graduate students.

The **University of Illinois** will award 10 graduate fellowships in the medical and allied health sciences, with stipends ranging from \$1,200 to \$2,400. Applicants need not have completed clinical internships. Application forms, which must be returned before *Feb. 15*, may be obtained from the Associate Dean, Graduate College, 808 S. Wood St., Chicago 12, Ill.

In addition to the summer fellowships at Woods Hole (*SCIENCE*, 114, 564 [1951]), the **Lalor Foundation** is underwriting a series of predoctoral fellowships in the natural sciences, with emphasis upon their biochemical and biophysical aspects, at Harvard, Johns Hopkins, and the universities of Delaware and Pennsylvania. Selections Committees at the respective universities will furnish further information.

The **National Council to Combat Blindness** will consider applications for grants-in-aid in support of ophthalmological research up to *Apr. 15*, awards to be made in June. The Committee on Research, consisting of Phillips Thygeson, Alson E. Braley, Dan M. Gordon, Stuart Mudd, Charles A. Perera, and Samuel L. Saltzman, awarded grants-in-aid totaling \$20,700 in 1951. For application blanks and further information, address the secretary of the council at 1186 Broadway, New York 1.

The **New York Zoological Society** is offering its annual grants-in-aid for summer research at the Jackson Hole Research Station. The program will include studies in ecology, animal behavior, and land management. For application blanks and further information, address the director, Jackson Hole Research Station, Moran, Wyo.

Fourteen **Sloan Fellowships** entitling recipients to participate in the MIT executive development program will be awarded to outstanding young executives in 1952. The program covers a year of advanced study in economics and business administration at the new School of Industrial Management, under the direction of Gerald B. Tallman, associate professor of marketing. Candidates must be between 30 and 35, and nomination by an employer is a prerequisite to application. Deadline for the receipt of applications is *Feb. 23*.

Smith College is offering approximately 20 graduate fellowships in botany and genetics, chemistry, geology, bacteriology, physics, and zoology. Full-time, teaching,

and research (in chemistry, genetics, and physics only) fellowships are available. The Arthur D. Little Fellowship, the first industrial fellowship in a woman's college, permits full-time graduate study for three years. For application blanks (returnable by *Mar. 1*), address Florence E. Young, Graduate Office, Smith College.

Closing date for receipt of applications for the **Waksman-Merck Postdoctoral Fellowship in the Natural Sciences** at Rutgers is *Feb. 15*, and the award will be made about a month later. U. S. and Canadian citizens about to receive the Ph.D. or equivalent degree, and interested in research in basic or applied phases of biology, chemistry, or physics, are eligible for the \$4,000, one-year award. Application forms may be obtained from the executive secretary of the Graduate Faculty.

In the Laboratories

Aluminum Company of America's director of research, Francis C. Frary, retired Jan. 1 and has been succeeded by Kent R. Van Horn, research metallurgist. Dr. Van Horn has been with Alcoa for 22 years, and Dr. Frary 32 years. Another veteran employee, John W. Schreiber, who has been with the company 42 years, retired as chief construction engineer, but will serve until July 1 as a special consultant on construction. He is being succeeded by L. B. Kuhns, a civil engineer who has been 27 years with Alcoa.

The **Johns Hopkins Applied Physics Laboratory** in Silver Spring, Md., has added one chemist, eight engineers, four mathematicians, one experimental psychologist, and five physicists to its staff recently.

The firm of **Bode-Lowry and Associates** has been organized by Harold E. Bode and Charles D. Lowry, Jr., to act as consultants in chemical market research and sales development. Mr. Bode has been head of chemical market research and assistant director of chemical patents for Corn Products Refining, and Dr. Lowry has been engaged in technical sales of antioxidants for petroleum and food products for the Universal Oil Products Company. Offices of the new firm are located in Chicago.

General Motors Research Laboratories has named Alfred L. Boegehold, mechanical engineer and former head of the Research Metallurgy Department, assistant to the general manager, succeeding E. V. Rippingille, Sr., who will retire Feb. 1, although he will be retained in a consultative capacity. Robert F. Thomson will succeed Mr. Boegehold. Cleveland F. Nixon, chemical engineer and director of process development for the GM Ternstedt Division, has become head of the Research Electro-Chemistry Department, succeeding William M. Phillips, who will continue on the Research Laboratories executive staff until his retirement next September.

Sterling-Winthrop Research Institute has appointed 12 new staff members: In organic chemistry, Robert

G. Christiansen, Mayo Karng, Samuel Schalit, Richard J. Stenger, and Frank C. McKay; in the Chemical Development Laboratory, Donald F. Page, Helmut C. Neumann, William J. Kammerer, and Theodore F. Mayr; in the Pharmacy Division, Horace P. Maietta. Ruth Holzapfel has been named research assistant on the staff of Oliver H. Buchanan, secretary. This staff coordinates the research of the various divisions.

Meetings and Elections

The Executive Board of the **International Council of Scientific Unions** held its annual meeting for the first time outside Europe when it met in the rooms of the National Academy of Sciences in Washington on Oct. 16-17. It was welcomed by Detlev W. Bronk, Academy president, in an address in which reference was made to Benjamin Franklin, a great scientific ambassador. Professor von Muralt, of Bern, president of the council, had referred in his opening remarks to Louis Agassiz, first foreign secretary of the Academy and one of the first to found an international research institute, in Switzerland. In addition to the members of the board, who came from ten different countries, a number of representative American scientists attended some of the meetings of the board; they came from the Department of State, the Academy of Sciences, the National Research Council, the National Science Foundation, and a number of national scientific committees. They supported von Muralt's statement that the center of gravity of science is moving from Europe to this side of the Atlantic. In addition to the routine annual business of the board, the following items were discussed: The allocation to the council and the various Unions of the grant-in-aid for 1952 of \$180,000 made by Unesco. The total allotted for the different categories (organizational expenses, publications, expenses for meetings of committees and congresses, symposia, permanent scientific services, international laboratories, administrative expenses) was fixed by Unesco. The internal allocation within these categories was made for the first time this year by the board. A new Joint Commission on Electron Microscopy was approved, its members being drawn from the Unions of Physics, Biological Sciences, and Chemistry. A special committee was authorized to consider arrangements for a Polar Year in 1957. A revised agreement with Unesco was approved. Reports from unions, joint commissions, permanent services, and international laboratories were reviewed. An international science abstracting service was started, with physics as its first subject, building on existing abstracting journals.

The business meetings of the board were followed by a "Symposium on Development of International Cooperation in Science." The speakers were F. J. M. Stratton, W. A. Noyes, Jr., J. N. Mukherjee, C. J. Mackenzie, Joseph B. Koepfli, and A. von Muralt. Visits were arranged to various scientific institutions in Washington. Generous hospitality was offered to the delegates by James E. Webb, Under Secretary

of State, the National Academy of Sciences, and by Dr. and Mrs. Wallace W. Atwood, Jr. It is hoped that one result of the visit of the board will be to make the activities of ICSU and the Unions more widely known among scientists in the United States.

The Section of Biology of the **New York Academy of Sciences** is holding a conference on the "Use of Antibiotics in Tropical Diseases" at the Barbizon-Plaza Hotel, New York, Jan. 17-19, following its conference on "Virus and Rickettsial Classification and Nomenclature," which was held Jan. 11-12. A third conference, on the "Biology of the Testes," will be held Jan. 25-26. All three conferences are international in scope.

Miscellaneous

The annual **Collier Trophy**, for outstanding achievement in American aviation, was awarded to the helicopter industry, the armed services, and the Coast Guard in a White House ceremony Dec. 17. The National Aeronautic Association is custodian of the trophy.

Atomic physicists from 12 European countries met at Unesco headquarters in Paris in December to draft plans for the setting up of a **European atomic research center**. Despite the need for speed, it is not expected that such a center can be set up before 1957 or 1958. Study groups will work for the next year perfecting plans for the construction, cost of which is estimated at 15-18 million dollars. George Thomson, of Britain, offered a \$700,000 synchrocyclotron being constructed by the University of Liverpool, which will be ready this year, and France, Belgium, Switzerland, and Italy have made offers of various sums of money. No decision has been taken as to the site of the center, but Geneva has been offered by the Swiss.

The French chemist **Antoine Laurent Lavoisier** (1743-94) will be honored by an exhibition of printed works and manuscripts at The Grolier Club, 47 E. 60th St., New York, Feb. 19-Mar. 18. A printed catalogue will be available at the club.

Among **new journals** recently received are: *Acta Geologica Polonica*, Vol. 1, No. 4, October 1950. Quarterly, published by the Muzeum Ziemi, Warsaw (in Polish). . . . *Acta Gerontologica*, Vol. 1, No. 1, January-February 1951. Published in Milan. Clinical editor, C. Vallecorsi; editor for morphology, C. Cavallo. 3,600 lire per year. . . . *Air Repair*, Vol. 1, No. 2, November 1951. A quarterly magazine devoted to air purification, published by the Air Pollution and Smoke Prevention Association of America. Editor: Robert T. Griebing. . . . *Bulletin of the Research Council of Israel*, Vol. 1, No. 3, August 1951. Quarterly. Published in Jerusalem in English. . . . *Chemical Engineering Science*, Vol. 1, No. 1, October 1951. Bimonthly. Articles in English, French, or German, preceded by a summary in English and one other language. £4 10s per year. Academic Press is U. S. distributor.