sult of their ultimate dependence on the sun's position, both of these components were found to undergo marked changes during the course of the day. The polarization arising within the water would seem to be largely accountable on the basis of Rayleigh scattering of light in the water. If this is so, the deep water pattern of polarization would most likely be similar to that near the surface on a heavily overcast day. Since a number of aquatic animals are known to be visually sensitive to polarized light, the possible relationship of the patterns described to the orientation and migration of zooplankton offers a promising area for future research.

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News and Notes

Advances in Calorimetry

Approximately 130 scientists representing more than 80 government, academic, and industrial laboratories in the United States, Canada, and Europe attended the 9th annual Calorimetry Conference, held at the General Electric Research Laboratory, Schenectady, N.Y., 17–18 Sept. The meeting included four sessions with a total of 36 papers delivered by leading calorimetrists from various branches of science. The final session consisted of informal discussions on new products and techniques in calorimetry in which the entire memberhip participated.

The conference program was arranged by the writer under the chairmanship of E. J. Prosen (National Bureau of Standards). Vincent J. Schaefer, director of research for the Munitalp Foundation, spoke on "Jet stream, thunderstorms and project sky-fire" before the conference dinner. David Turnbull (G.E. Research Laboratory), delivered the welcoming address and reviewed the several regions of calorimetric research in which G.E. is actively interested. Guy Waddington (Bureau of Mines, Bartlesville) delivered the first of a series of lectures that will hereafter be given annually and will be known as the Hugh M. Huffman memorial lectures in honor of the late Dr. Huffman, organizer and first chairman of the conference. Dr. Huffman's work, his contributions, and their significance to the field of thermochemistry were summarized. Some of this work has formed the "basis of master tables" of thermodynamic properties. Other features of the lecture referred to technical advances in thermochemistry, such as the "rotating bomb," and to the problems and accomplishments in the thermochemistry of compounds containing sulfur, halogens, and fluorocarbons.

The latest developments and modifications in high-precision bomb calorimetry were reported in a series of three papers that were a part of the first session. A. K. Meetham (National Physical Laboratory, England) described N. P. L. No. 1 bomb calorimeter. Some of the special features reported were (i) a simple method of ignition, (ii) complete sealing of the calorimeter, and (iii) a numerical method of correction for heat transfer. The second rotating bomb calo-

rimeter designed and built at the Bureau of Mines (Bartlesville) was discussed in a paper by D. W. Scott, W. D. Good, and W. N. Hubbard. Some of the improvements that were emphasized were a direct line of the rotating mechanism for revolving the bomb directly, the use of a standard calorimetric-type resistance thermometer, and modification in the design of the jacket lid.

The technique used for determining the combustion heats of some organic metallic compounds was described by P. Waszeciak, R. E. Miller, and H. Stange (Mathieson Chemical Corp.). Results were reported for several borane compounds.

The latest developments in cryostat designs for measuring heat capacities from below 1°K to room temperature were discussed in four papers. D. H. Andrews (Johns Hopkins University) described a unit designed for measuring thermal capacities of liquids and liquid mixtures. The calorimeter heating is continuous and the adiabatic control is automatic. The specific heats of sodium, potassium, and rubidium have been measured in the temperature range of 13° to 325°K. According to H. Preston-Thomas (National Research Laboratories, Ottawa), the data were obtained from an adiabatic calorimeter where the heat input to each specimen was continuous; all results were recorded graphically. Accuracy of 0.1 percent can be attained when the temperature difference between the shield and the sample is kept within 3×10^{-4} deg. Specific heat curves of sodium and rubidium appear with anomalies of the order of ½ and 2 percent. An adiabatic calorimeter for measuring specific heats in the temperature range of 2.5° to 20°K has been used by J. S. Dugdale, J. A. Morrison, and D. Patterson (National Research Laboratories, Ottawa) on studies concerning the effect of particle size on specific heat. The Simon expansion method of producing liquid helium has been adapted. Adiabatic control is manual. The "difference" thermocouple consists of Ag-Au versus Au-Co.

Calorimetry below 1°K was discussed by J. G. Daunt and G. deVries (Ohio State University). Measurements on the specific heat of liquid helium 3 in this temperature range have been made. Among the several unique features reported were the design (and operation) of a superconducting thermal valve.

Microcalorimetric methods applied to the study of stored energy, recrystallization energies, and lattice imperfections were presented to the conference in three papers. A. W. Overhauser (Cornell University) has designed and constructed two microcalorimeters. The first unit has a fast adiabatic jacket, making it adaptable for measuring the release of stored energies for fast annealing. The second unit measures energies of annealing due to radiation damage. Approximately 0.01 cal energy release over a temperature range of −140°C to room temperature can be measured to an accuracy of 10 percent. The sensitivity of the apparatus is about 10^{-5} cal/deg.

The measurement of energy of recrystallization of copper, using a Borelius-type isothermal-jacketed microcalorimeter, was presented by Paul Gordon (University of Chicago). The apparatus has been used to study the isothermal annealing of high-purity copper after room temperature deformation. The limit of detection is a heat flow of 0.003 cal/hr. It is claimed that the absolute accuracy of the determinations is usually in the vicinity of from 2 to 5 percent. A twin adiabatic microcalorimeter for measuring stored energy in metals has been designed and operated by F. B. Riggs, Jr. (Harvard University). The instrument compares the temperatures of a "passive" thermal mass and an "active" thermal mass when both are supplied with the same power. Temperature difference between the two specimens is detected by means of a 30-junction thermopile; 10 μcal suddenly released in 25 g of material can be detected.

The application of calorimetric methods to the study of ordering in magnetic systems was the subject of three papers. J. W. Stout and E. Catalano (University of Chicago) presented thermal capacity data showing the thermal anomalies associated with the antiferromagnetic ordering in the difluorides of manganese, iron, cobalt, and nickel. By utilizing data on the isomorphous compound ZnF_2, the contribution of the lattice was estimated by a "corresponding states" argument, and the entropy change and the heat capacity arising from the antiferromagnetic ordering in the paramagnetic salts were calculated. L. D. Roberts and R. Murray (Oak Ridge National Laboratory) reported measurements in the temperature range of 1° to 4°K of the thermal capacity and magnetic properties of UI_3 and $MnCl_2$. Both of these salts exhibit maxima in thermal capacity and anomailes in magnetic properties near 2°K, but the data are not explainable in terms of existing theories of antiferromagnetism. In UI_3 there is a large magnetic contribution to the thermal capacity at temperatures well above the maximum, and in $MnCl_2$ two thermal capacity peaks are found. Data on thermal effects in nickel-zinc ferrites were presented by E. F. Westrum, Jr. (University of Michigan). Thermal capacity measurements between 5°K and room temperature showed nothing anomalous in a ferrite where the ratio of zinc to nickel was 1.5. But, as this ratio was increased, thermal anomalies accompanied by a slowness in attaining thermal equilibrium became evident at the lower end of the temperature range (presumably associated with a magnetic contribution to the heat capacity).

Two papers dealt with calorimetric investigations and superconductivity. The results of measurements on lanthanum in the temperature range of 1.6° to 6.3°K were presented by A. Berman, M. W. Zemansky, and H. A. Boorse (Columbia University). Data indicated that the samples used were a mixture of hexagonal and cubic modifications that have different transition temperatures. In a magnetic field of 600 oersteds, the thermal capacity is a smooth function of the temperature, coinciding with the zero field data at temperatures above the upper transition. On a plot of

C/T vs. T^2, the data are not linear and cannot be interpreted as a linear electronic term plus a T^3 lattice term with a constant Debye θ. An investigation of the specific heat of superconducting vanadium by W. S. Corak, B. B. Goodman, C. B. Satterthwaite, and A. Wexler (Westinghouse Research Laboratories) showed that the electronic contribution to the specific heat is better represented by an exponential function than by the T^3 dependence previously deduced.

A precision calorimeter for measuring small differences in heats of alloy solutions in molten tin was described by J. S. L. Leach (Massachusetts Institute of Technology). The calorimeter has been intended primarily for measuring energy retained in metals and alloys after cold working. The unit has been used to measure the heats of formation and the heats of solution in tin. A new reaction calorimeter, quasi-isothermal in design, has been designed and constructed by O. J. Kleppa (University of Chicago). Certain features of the calorimeter make it particularly suitable for studies up to 500°C involving heats of mixing and heats of solution in alloy systems.

Michael Hoch and H. L. Johnston (The Ohio State University) have obtained heat content data on Ta, W, Al_2O_3, ThO_2, and TaC between 1000° and 3000°K. Although there is agreement with previous work in the overlapping regions (300° to 1700°K), the extrapolation of this earlier work in the temperature range of 2000° to 3000°K gives much higher figures than the measured values. Based on the new values in the high temperature region, reliable extrapolation has now been made. R. A. Oriani and W. DeSorbo (G.E. Research Laboratory) reported on the thermal capacity of a single-solution alloy $Au_{.52}$ $Ni_{.48}$ in the temperature regions 13° to 1190°K by means of a low-temperature isothermal calorimeter (Giauque-Johnston type) and a Bunsen drop calorimeter. The change in thermal capacity that accompanies the formation of the solid solution from pure gold and nonmagnetic nickel has been evaluated, and it has been shown to be positive over the entire temperature range.

If one considers interactions between the nearest and next-to-the-nearest neighbors only, the Born-von Karman theory of specific heats requires only two constants to characterize the contribution of the lattice to the atomic heat. J. R. Clement (Naval Research Laboratory) described a simple method for determining empirically the values of these constants from calorimetric data alone. The theoretical procedure was outlined, and a comparison was made between theory and experimental data for fcc and bcc lattices.

Low-temperature calorimeters (both isothermal Nernst-Giauque and adiabetic) play a leading role in the study of surface phenomenon on solids. E. L. Pace (Western Reserve University) has used them in making measurements on adsorption isotherms, heats of adsorption, and thermal capacity of simple gases adsorbed on finely divided nonporous surfaces. The calorimetric data have been used to determine the energy distribution at the adsorption sites and the zero-point entropy. A calorimetric method for the measurement of heat transfer by radiation and gas conduction between room temperature and 77°K was described by F. J. Zimmerman (Arthur D. Little, Inc.). It was found that buffing or polishing plated surfaces increases the heat transfer by radiation. The best surface for minimizing radiation heat transfer was found to be silver lume.

Energetics of high-polymer solutions and polymerization problems were the topics of two papers. Marcel Rinfret (University of Montreal) described a conduction microcalorimeter for the determination of heats of solution of high-polymers; and B. R. Thompson described an isothermal calorimeter that utilizes the heat-flow method and is used for the study of heats of polymerization for systems under pressure. Thompson also described a simple adiabatic calorimeter that is used to follow the course of the polymerization in sealed glass tubes where conventional techniques are not applicable. Edward Wickers (National Bureau of Standards) reviewed briefly (i) three types of reference materials prepared by NBS at the request of the Calorimetry Conference for the precise intercomparison of thermal capacity calorimeters; (ii) materials available for standardizing combustion calorimeters; (iii) thermometric standards. The conference committee for handling requests for the various calorimeter standards available from the NBS consists of E. J. Prosen (NBS) and W. DeSorbo.

The final session of the conference was devoted for the most part to an informal "experience discussion" and presentation of new products and techniques. J. R. Clement presented data on the thermal capacity of a 1-w carbon resistor (Allen Bradley Co.) and also on a simple method for deducing temperature values from resistance data utilizing a two-constant formula. According to Clement, this method affords the best means yet found for making the interpolation in calibration data between 4.2° and 10° K. He also announced the resistance temperature characteristic and reproducibility of a new 0.1-w resistor of smaller physical size than was heretofore available, and that is now commercially available (Allen Bradley Co.). Utilizing the results of a series of recent investigations that have brought the temperature scale closer to the true thermodynamic scale, Clement also reported changes in calorimetric data previously based on earlier scales. Vapor "oscillations" have been found to affect the vapor pressure of low-temperature liquids. Their influence on the accuracy of the temperature scale was also pointed out by Clement.

An automatic bath temperature-control unit operable in the temperature region 1.5° to 20°K was discussed by M. D. Fiske (G.E. Research Laboratory). In the liquid helium region the vapor pressure of the refrigerant can be controlled to a constancy of ± 0.0005°K. In the hydrogen region the control is even better. J. N. Ratti (Engineering and Research Corp., Riverdale) spoke on both shield and temperature-control units with a servomechanism for higher-temperature refrigerant liquids. C. V. Heer, C. B. Barnes, and J. G. Daunt (Ohio State University) described

the extension of isothermal calorimetry techniques to temperatures as low as 0.2°K by the use of the magnetic refrigerator. Copper wire-inserted glass tape (Atlas Asbestos Co.) is finding its use in the construction of low-temperature calorimeters, according to G. T. Furukawa (NBS). J. M. Berry (G.E. Research Laboratory) discussed the thermoelectric stability of different thermocouple materials for use in high-temperature calorimetry as well as the thermoelectric effects of strain, both elastic and plastic, on the thermal emf. F. B. Riggs (Harvard University) told the group about gold thermopile leads for high-temperature microcalorimetric investigations. C. R. Droms (G.E. General Engineering Laboratory) demonstrated a simple circuit that converts the nonlinear thermistor characteristics to essentially linear dial readings on a bridge. R. A. Oriani mentioned details of a high-temperature differential solution calorimeter now under constrnction.

The conference unanimously adopted the following recommendation to the National Bureau of Standards concerning the extension of the international temperature scale to liquid helium temperatures.

The use of temperatures below the boiling point of oxygen in pure and applied research has increased several fold within the past decade. The development of the Collins Helium Cryostat has played a major role in making this temperature range available. Most of these cryostats are now in service in the United States, but several are also in service in foreign countries. The measurement of temperature in this range is of primary importance to the value of the work accomplished and is international in scope.

The need for fixed temperature points and mathematical relationships between resistance and temperature below the boiling point of oxygen is a growing one. The establishment of an accurate temperature scale in this temperature region should be investigated by a standardizing laboratory of international standing. The National Bureau of Standards has as one of its functions the establishment and maintenance of thermometric standards and is uniquely fitted to undertake the investigations required to provide an accurate scale of temperature in the region below the oxygen point. It is recognized that the temperature region below 10°K may require the utilization of temperature-sensing devices that will differ in nature from the instrument used in the range 10°K to the oxygen point. The members of the Calorimetry Conference therefore recommend that the National Bureau of Standards undertake investigations aimed at providing the following urgent needs of American scientists: (i) An accurate temperature scale from 10°K to the oxygen point. (ii) A provisional temperature scale and standard thermometers to cover the range 0.1° to 20°K.

At the business meeting held at the beginning of the last session, E. F. Westrum, Jr., became chairman-elect and D. R. Stull was reelected director for a 2-yr period. Other members of the board of directors for 1954–55 are Warren DeSorbo as chairman, J. W. Stout, E. J. Prosen, and Guy Waddington.

WARREN DESORBO
General Electric Research Laboratory, Schenectady, New York

Science News

The skullcap of **Saldanha man** was discovered by K. Jolly and R. Singer in 1953 at Hopefield, South Africa. In a recent number of the *American Anthropologist* [**56**, 879 (Oct. 1954)], M. R. Drennan reports on Saldanha man and his archeological and paleontological associations. The site of discovery has yielded hand axes characteristic of the South African Earlier Stone Age, as well as other stone implements typical of the Middle Stone Age. Drennan regards Saldanha man as the maker of the hand axes, particularly since the associated fossil assemblage suggests great paleontological age. These fossils include the extinct Cape horse, giant bush pig, African mammoth, and primitive giraffe, and also existing rhinoceros, hippopotamus, and antelopes. The fluorine content of the Saldanha skull agrees with that of the older extinct mammals and is comparable to that of European Acheulian bones.

The thick human skullcap has an estimated cranial capacity of 1200–1250 ml. Although somewhat resembling those of European Neanderthal skulls, it bears a greater likeness to the brain-case of Rhodesian man. The nuchal plane is inclined backward as in Neanderthal skulls, a feature which Drennan regards as indicating a crouching posture; in this respect it differs from the Rhodesian skull, in which the nuchal plane is disposed horizontally as in *Homo sapiens*. The Saldanha brain-case especially resembles the Rhodesian in its massive and shelving brow ridges, skull breadth, and coronal contour. Drennan, although recognizing that the incompleteness of the skull forbids taxonomic dogmatism, regards the Saldanha specimen as a primitive proto-Australoid type whose closest affinities are with the Rhodesian skull, from which it seems to differ to the extent of being a regional variety, and as possibly a more primitive forerunner of the Rhodesian race. In the absence of the facial skeleton, however, one can accept any suggested special relationship to Rhodesian man only with great reservation; for there is ample evidence of a rather low degree of correlation between facial and brain-case morphology in Pleistocene man. It is to be hoped that the industry and perseverance of Prof. Drennan and his associates will be further rewarded by additional and more complete human material.—W. L. S., JR.

Each American citizen contributes slightly more than 2 ct/yr toward support of the **World Health Organization.**

A survey to learn **public reaction to science news** reporting is being launched by the National Association of Science Writers. It will be directed by Hillier Krieghbaum, associate professor of journalism at New York University. Financed by a $10,000 grant from the Rockefeller Foundation, the study is designed to help make science news meaningful to the public.

The NASW plans to engage a professional fact-finding organization to poll the attitudes of a nation-

wide cross section of the public toward science reporting by newspapers, magazines, television, radio, and motion pictures. Previously, the NASW and NYU have surveyed the attitudes of editors and scientists.

A 6-wk oceanographic **cruise in the Gulf of Alaska** was made in August and September aboard the R. V. *Brown Bear* by a group of investigators from the department of oceanography of the University of Washington, Seattle. Nine scientists and technicians under the leadership of Robert G. Paquette participated in the expedition, for which Richard G. Bader and Herbert F. Frolander, respectively, were in charge of the geologic and biological work. This survey cruise, sponsored by the Office of Naval Research, was the first to cover the entire gulf and should give a good general picture of the oceanographic conditions during summer.

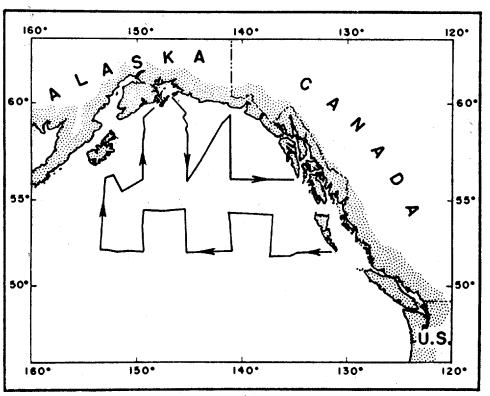

Fig. 1

Sixty stations were occupied in the area bounded by the coordinates 52°N, 154°W, and the coasts of Alaska and British Columbia (Fig. 1). Measurements were made of salinity, temperature, dissolved oxygen, and inorganic phosphate to depths as great as 5000 m. In addition, currents were measured with the geomagnetic electrokinetograph, the entire area was systematically sampled for plankton, and—with a gravity-type corer—a number of sediment samples were taken from the shelf, and from the tops of sea mounts in the deep oceanic areas. A continuous echo-sounding record was kept over the entire cruise track.

Preliminary indications are that the existence of a counterclockwise circulation of surface water in the Gulf of Alaska will be confirmed and established in greater detail than previously. The zooplankton concentrations were relatively high, and show a distinct correlation with the water properties and probably with the depth of the deep scattering layer. The microfauna and composition of the sediments should supplement existing information on paleoecology, climate, and sediment distribution. The results of the survey will be published in the appropriate scientific journals.

The **American Nurses Association** recently disclosed that its Georgia affiliate is the only one that still bars Negroes from membership.

Successful **transplantation of the thyroid gland** from the neck of a dead infant to the groin of a 29-yr-old woman was reported by Julian A. Sterling and Ralph Goldsmith of the Albert Einstein Medical Center, Philadelphia, at the recent meeting of the American College of Surgeons. The operation to remove the gland from the 21-day-old baby started 1 hr after the child's death; 5½ hr later the major blood vessels of the stem of the gland had been stitched to the blood vessels in the young woman's groin and the final dressing had been bandaged on her wound.

The patient had had her own overactive thyroid gland removed 10 yr previously. Immediately after this, symptoms of tetany with spasms, trembling, and muscular pains developed. She had to take vitamins and thyroid extract one to five times a day and calcium salts by injection into veins as often as four times a day. Apparently the parathyroid glands had been removed along with the thyroid. Attempts to correct this by transplanting parathyroid glands failed. The grafting of the baby's thyroid was done 2 yr ago. Since then the young woman has been well and happy and able to do her own housework. The only medicine she takes is an occasional oral dose of calcium.

The urgency of a national program for the development and conservation of "our most **precious resource**, the limited number of young people with high ability," was recently stressed by Alan T. Waterman, director of the National Science Foundation, before the House Subcommittee on Educational Activities. Waterman indicated that, in the long run, improvement in the quality of scientific and technical training is as important as a sufficient increase in the number of those trained. A serious problem exists in the lack of sufficient scientific manpower, and the year 1954 represents the low point in college graduations, reflecting the low birth rate at the depth of the depression. From now on the number of graduations will increase so that by the 1960's, when the children born in the 40's graduate from college, a doubling in the output of college graduates is expected. The need then will be even greater. Waterman stated:

> The task before us in maintaining the quality of training of this great increase in enrollments is one of the most serious problems facing us in maintaining economic and defensive strength.

Waterman called attention to the all-out effort by the Russians to increase their supply of scientists and engineers and outlined in broad strokes efforts underway by the National Science Foundation to develop a U.S. program for producing an adequate supply of scientists and engineers. In particular, he pointed to the necessity for assuring a sufficient number of teachers and for improving science instruction in the secondary schools and in many of our colleges and universities.

As an indication of our present manpower potential, Waterman quoted recent statistics showing that less than half of the top quarter of high school graduates

now complete college. Although economic factors may play a part in this situation, he stated that lack of adequate motivation to continue advanced training is also a major factor. The foundation is currently attempting to determine what other factors are at work and how to meet them.

The U.S. Atomic Energy Commission has presented the Japanese Government with a complete technical library of unclassified and declassified **literature on atomic energy.** The Ministry of International Trade and Industry is the governmental agency responsible for atomic energy matters in Japan.

The gift library consists of 10,000 AEC research and development reports, 3000 of which are on microcards; 28 bound volumes of the commission's National Nuclear Energy Series; nine bound volumes of abstracts of some 50,000 technical reports and articles from this country and abroad; and 25,000 sets of index cards and other material. The collection is a duplicate of the material now available in 42 repository libraries in the United States. The Japanese Government will receive the same additions that are made from time to time to the American libraries.

A survey conducted by the Agronomic Manpower Resources Committee of the American Society of Agronomy reveals that this country's **crop and soil scientists** have many special skills that are useful to the nation in wartime. Information was obtained from questionnaires answered by those scientists who had received their college degrees after 1941. The greatest number listed themselves as trained to supervise the production of food. Other categories checked most frequently were supervision of the establishment of suitable vegetation at military airports, development and production of chemurgic and textile plants, participation in wartime chemical research and wartime chemical industry, advising on efficient utilization and distribution of basic fertilizer materials, and soil mapping for trouble areas.

The questionnaire also revealed that 95 percent of the scientists with master's degrees served at least 3 yr in the armed forces during World War II; the percentage was 77 for those with doctor's degrees. In the report on the survey it was made clear that crop and soil scientists are not asking for special privileges. However, they do ask that their talents be used in jobs for which they are especially trained, either in a military or a civilian capacity, and not be indiscriminately wasted, as was so often the case during the last war.

In the October *Journal of Chemical Education* Martin Levey of Pennsylvania State University traces the **origin of the manufacture of soap** back more than 5000 yr. He points out that the earliest soaps "were made for medical purposes and for the washing of wool but not for general detersive use." Soda and potash from plant ash were the most common washing agents from early antiquity until the middle of the 19th century.

President Eisenhower reaffirmed his opposition to socialized medicine as he accepted the Frank H. Lahey memorial award for "outstanding leadership in medical education." The President said that he was interested in raising private funds to help medical schools "because this is one profession we don't want to get under the dead hand of bureaucracy." The award is sponsored jointly by the National Fund for Medical Education, the American Medical Association, and the Association of American Medical Colleges.

Two facts about the **nation's dental health** were made clear at the recent annual meeting of the American Dental Association. First, despite steady advances in dental science and availability of dental services, there is still a tremendous backlog of dental neglect. More than 90 percent of children have one or more decayed teeth by the time they reach school age. At the age of 15 yr, more than 95 percent have decayed permanent teeth, and the average child has lost two teeth because of lack of treatment. The average adult has lost half his teeth by the time he reaches 40. Less than one-third of the American people, it is estimated, received adequate dental services.

The second and equally signficant fact is that there seems to be little possibility of substantially remedying this situation in the near future. Today there are about 85,000 active dentists in civilian life, approximately half the national total of physicians. Some 6300 are in the armed forces, and 900 are employed by the Veterans Administration, 300 by the Public Health Service, and 200 by health departments.

Because enrollment in dental schools was low in the depression years, a disproportionately small number of dentists are in the 30- to 40-yr age group. More than 45 percent of our dentists are 50 yr old or older, as compared with 38 percent of the physicians. Although the total supply of dentists has increased considerably since 1941, the gain has not kept pace with population growth.

On 12 Nov. a **coelacanth** was captured alive in the Comoro Islands, off northern Madagascar. Several specimens of this primitive "fish," an important link in the evolution of mammals, have been caught previously, all off the Comoro Islands, but this is the first one to survive capture.

Following Lodge's report to the United Nations that the United States will allocate **220 lb of fissionable material** to the international agency that the President has suggested to carry out his atoms-for-peace proposal, Britain announced a contribution of 44 lb. An editorial in the 17 Nov. issue of the *New York Times* points out that although 264 lb is not really very much, especially when it is to be distributed among a considerable number of small experimental reactors in different countries, nevertheless, "the outright gift of fissionable material probably worth several millions shows that the President is willing to support a program with deeds that will surely be received with enthusiasm. . . ."

Scientists in the News

Enrico Fermi, 1938 Nobel prize winner and professor of physics at the Institute for Nuclear Studies, University of Chicago, has been named recipient of the first special award by the U.S. Atomic Energy Commission. The Atomic Energy Act of 1954 authorizes such awards for "especially meritorious contributions for the development, use, or control of atomic energy." The award to Fermi, which was recommended by the AEC General Advisory Committee and approved by President Eisenhower, is $25,000. It will be accompanied by a citation noting Fermi's contributions to basic neutron physics and the achievement of the controlled nuclear chain reaction.

Fermi's accomplishments in physics, and in particular his contributions to the development of atomic energy, have been of tremendous importance. The Fermi-Dirac particle statistics, the theory of beta-decay, the Fermi-Thomas model of the atom, neutron-induced radioactivity, and a theory of the origin of cosmic rays, are included among his experimental and theoretical works.

An Italian-born pioneer in nuclear studies, Fermi designed and directed construction of the first atomic reactor. It was built on a squash court at the university's stadium, where on 2 Dec. 1942 the first nuclear chain reaction took place.

Fermi directed the advanced physics division of the Los Alamos laboratory during World War II. After the war he was for several years a member of the AEC General Advisory Committee. He was a wartime colleague of J. Robert Oppenheimer at Los Alamos and testified for Oppenheimer at AEC hearings earlier this year.

Dr. Fermi, 53, died of cancer on 28 Nov. In a statement to the press Lewis L. Strauss, chairman of the AEC described him as "one of the world's greatest atomic physicists."

Ernest H. Volwiler, president and general manager of Abbott Laboratories, Chicago, is to receive the Industrial Research Institute medal for 1955. The medal is awarded annually to honor "outstanding accomplishment in leadership in or management of industrial research which contributes broadly to the development of industry or the public welfare."

G. T. Anderson, president of La Sierra College, Riverside, Calif., has become the ninth president of the College of Medical Evangelists, Loma Linda and Los Angeles, Calif. He succeeds **W. E. Macpherson,** who has been appointed to the deanship of the School of Medicine that was left vacant when Harold Shryock resigned in August.

Joel E. Hildebrand of the University of California delivered the 1954 Treat B. Johnson lectures in the department of chemistry of Yale University during the period 26 Oct. through 5 Nov. His subject was the "Theory of liquids and solutions."

Paul M. Doty has been named Wallace H. Carothers research professor of chemistry at Harvard University for 1955–56. During the year Doty will devote full time to his continuing research on large molecules, particularly the relation of the structure of nucleic acids and polypeptides to their biological function. **Peter J. W. Debye,** emeritus professor of chemistry at Cornell University and winner of the Nobel prize in chemistry in 1936, will take over Doty's teaching duties for the year.

The Carothers research professorship was founded by the Du Pont Co. in 1951 in honor of Wallace Hume Carothers, inventor of nylon. Dr. Carothers served as instructor in chemistry at Harvard from 1926 to 1928. He died in 1937.

Alfred E. Livingston, formerly of the College of Pharmacy, Philadelphia, has been appointed professor of pharmacology in the College of Pharmacy at St. John's University, Brooklyn. Livingston, who has devoted more than 40 yr to teaching in medical schools, served from 1929 until 1950 as chairman of the department of pharmacology at Temple University.

Vernon M. Setterholm, who has been associated with Vitro Corp. of America since 1947, has been appointed associate director of the company's Silver Spring (Md.) Laboratory.

Jean Redman Oliver, pathologist, and **Arnold Eggerth,** microbiologist, both of whom retired on 1 Sept. from the State University of New York College of Medicine in Brooklyn, have been named professors emeriti "in recognition of their outstanding professional endeavors and many years of loyal service to the College." Having completed 25 and 35 yr of service, respectively, the two men joined the college when it was still the Medical College of the Long Island College Hospital. During their service they witnessed two major changes in the college's status—one in 1930 when it became separately incorporated as the Long Island College of Medicine, and the other in 1950 when it became one of the constituent units of the State University of New York.

Oliver, who was appointed the first Distinguished Service Professor in the State University last fall, is internationally known for kidney research. In 1939 he published his "Architecture of the kidney in chronic Bright's disease," and 2 yr later he developed a technique of microdissection that made possible the application of Richard's puncture procedures to the mammalian kidney. His experiments comprise the fundamental direct observations on which the mammalian renal physiological theory is based. Last October he received the 1953 Borden award for "outstanding research in medicine" at the Atlantic City convention of the Association of American Medical Colleges.

Eggerth, who has the longest record of service on the college faculty, has endeared himself to thousands of students. As guest of honor at the annual alumni dinner in May, he was presented with a scroll testi-

fying to the admiration and affection that his former students feel for him. Although retired from the faculty, Eggerth will continue in active association with the college, assisting **Jean A. Curran,** recently appointed professor of the history of medicine, in the organization of a new department of historical and cultural medicine. At present Eggerth is writing a history of the Hoagland Laboratory, the college's oldest building and the first privately endowed laboratory for research in bacteriology in the United States.

Selman A. Waksman, microbiologist of Rutgers University who earned a Nobel prize in 1952 for his discovery of streptomycin, has received the Award of Honor from the American Jewish Congress for his "epochal contribution to medical science and his dedicated and continuing service to the advancement of human welfare."

John T. Goodwin, formerly of the General Electric Co., has been appointed manager of the chemistry research division of the Midwest Research Institute. Goodwin has been closely associated with the development of silicones, the group of synthetic materials widely used in lubricants, synthetic rubbers, polishes, and many similar products.

On 1 Oct. **Mario Stefanini,** formerly of the New England Center Hospital, Boston, joined the department of medicine, University of Louisville School of Medicine.

Andrew E. Buchanan, Jr., has been promoted from assistant general manager to general manager of the Du Pont Co.'s textile fibers department. He succeeds **Robert L. Richards,** who will become a member of the board of directors, a vice-president, and a member of the executive committee.

The following appointments to the scientific staff of the medical department at Brookhaven National Laboratory, Upton, N.Y., have been announced.

John L. MacIver, Jr., until recently a flight surgeon in the U.S. Navy, division of industrial medicine.

Richard I. Weller, division of medical physics. He was formerly on the physics faculty of Brooklyn College and the Maritime College at Fort Schuyler, N.Y.

Herschel Sandberg, formerly a resident in medicine at Albert Einstein Medical Center, Philadelphia, division of physiology and assistant physician to the hospital.

Walton W. Shreeve, who has completed a tour of duty as head of the Isotope Laboratory at the U.S. Naval Hospital, Oakland, Calif., division of biochemistry and physician to the hospital.

William H. Perkins, formerly instructor in medicine at the University of Arkansas, division of physiology and assistant physician to the hospital.

Eugene P. Cronkite, who was head of the hematology division of the Naval Medical Research Institute at Bethesda, Md., division of pathology.

The Penrose medal, the highest honor conferred by the Geological Society of America "in recognition of outstanding original contributions and achievements," has been awarded to **Arthur F. Buddington** of Princeton University's department of geology. He was chairman of the department from 1936 to 1950, when he resigned to devote more time to research and teaching. In World War II, Buddington served with the National Defense Research Commission and later as the principal geologist in charge of the study of iron ore potentials in New York, New Jersey, and Pennsylvania.

William T. Nichols, previously at the Monsanto Chemical Co., and a past president of the American Institute of Chemical Engineers, has recently joined the staff of Arthur D. Little, Inc.

K. C. Black, formerly of the Polytechnic Research and Development Co., Brooklyn, N.Y., has been made head of Raytheon Manufacturing Co.'s communications engineering department.

Carl F. J. Overhage, Jr., assistant director of the color technology division at the Eastman Kodak Co., Rochester, N.Y., has been appointed a technical division head at the Lincoln Laboratory, Massachusetts Institute of Technology.

Frank J. Orland, who has been associated with the University of Chicago since 1935, has been appointed director of the university's Walter G. Zoller Memorial Dental Clinic. He succeeds **J. Roy Blayney,** the clinic's head since its founding in 1936. Orland is also an assistant professor of microbiology whose research work has been concerned with dental caries and with oral microbiology. The Zoller Clinic has been carrying on several major research projects, including the Evanston fluoridation study and the collaborative study with the Lobund Institute of the University of Notre Dame on basic mechanisms in dental caries.

King D. Bird of the Cornell Aeronautical Laboratory, Inc., has been promoted to head of the newly formed Operations Branch of the laboratory's 12-ft, variable density wind tunnel. He will be responsible for all phases of engineering, planning, and testing of models in the tunnel. The new branch will provide a tie between project engineering, operations, model set-up, and design.

Among recent appointments to the staff of the Argonne National Laboratory, Lemont, Ill., are **Marcel W. Nathan,** chemical engineering; **Robert J. Epstein,** electronics; **Ambrose D. Barton, Anna K. Barton,** and **Edward W. Daniels,** biological and medical research.

Norman Applezweig Associates, consulting biochemists of New York City, have appointed **Marvin Cook,** former chief chemist of June Dairy Products Co., Inc., as director of their Food and Flavor Laboratories.

Necrology

Charles F. Batchelder, 98, naturalist, author, editor, and associate in mammalogy and ornithology at Harvard University Museum of Comparative Zoology, Cambridge Mass., 7 Nov.; **Albert F. Blakeslee,** 80, research botanist and geneticist, former president of the AAAS, visiting professor of botany and director of the Smith College Genetics Experiment Station, Northampton, Mass., 16 Nov.; **Ambrose G. Bricks,** 56, chemist with the United States Metals Refining Co., Carteret, N.J., 10 Nov.; **George A. Campbell,** 83, mathematical physicist, inventor, and pioneer in electric communications research with Bell Telephone Laboratories, Upper Montclair, N.J., 10 Nov.; **Edward S. Cowles,** 75, psychiatrist, neurologist, author, and former head of the department of psychopathology at the Polyclinic Medical School and Hospital, New York, 16 Nov.

Joshua D'Esposito, 76, chief engineer of the Chicago Union Station project, former state engineer for the Public Works Administration, and federal project engineer on the Chicago subway, 16 Nov.; **Leslie E. Dills,** 54, associate professor of economic entomology at Pennsylvania State University, State College, 5 Oct.; **George C. Dunham,** 67, retired director of the health and sanitation division of the Inter-American Affiairs Organization, San Francisco, 4 Oct.; **Louise H. Gregory,** 74, professor emeritus of zoology and former acting dean of Barnard College, New York, 1 Nov.; **Morris E. Gross,** 57, dentist, author, and lecturer, Brooklyn, N.Y., 5 Nov.; **William P. Healy,** 76, cancer specialist, past president of the American Gynecology Society, and former dean of the Fordham University medical faculty, New York, 7 Nov.; **Walter J. Jebens,** 49, chemical engineer for the Bakelite Co., Bound Brook, N.J., 13 Nov.

Mack C. Lake, 64, mining engineer, geologist, and retired president of the Orinoco Mining Co., San Francisco, 9 Nov.; **John A. Linder,** 61, illumination engineer and inventor with the Westinghouse Electric Co., New York, 6 Nov.; **Emma O. Lundberg,** 73, first director of the social service division of the Children's Bureau, U.S. Dept. of Health, Education, and Welfare, Washington, D.C., 17 Nov.; **John McCall,** 31, University of Alaska glacier specialist, Fairbanks, 5 Nov.; **James H. McGregor,** 82, anthropologist, professor emeritus of zoology at Columbia University, and associate in human anatomy at the Museum of Natural History, New York, 14 Nov.; **James L. Morrison,** 41, associate professor of pharmacology at Emory University, Atlanta, Ga., 3 Nov.; **Harris P. Mosher,** 87, throat and nose specialist, former president of the American Otological Society, and inventor of surgical instruments, Marblehead, Mass., 4 Nov.

Howard W. Odum, 70, sociologist, psychologist, founder and former director of the Institute for Research in Social Science, former president of the American Sociological Society, author, founder and editor of *Social Forces,* and retired professor of sociology at the University of North Carolina, Raleigh, 8 Nov.; **Arthur W. Pence,** 56, commanding general of the Army Crops of Engineers Center at Fort Belvoir, Va., 8 Nov.; **Charles S. Prest,** 79, pioneer in public health work and tuberculosis control measures, lecturer, and managing director of the Brooklyn Tuberculosis and Health Assoc., N.Y., 11 Nov.; **Francis S. Schwentker,** 50, pioneer in sulfa therapy, president of the Society for Pediatric Research, professor of pediatrics and director of the Harriet Lane Home at Johns Hopkins Hospital, Baltimore, 8 Nov.; **Leslie B. Seely,** 77, instructor in physics at Pennsylvania State College of Optometry, Philadelphia, 6, Nov.

Orpha M. Thomas, 48, former associate professor of home economics at Teachers College, Columbia University, New York, 6 Nov.; **Lewis R. Thompson,** 71, former assistant surgeon general of the U.S. Public Health Service, scientific director of the Rockefeller Foundation's international health division, and retired director of the National Institutes of Health, Bethesda, Md., 12 Nov.; **Timothy Leary,** 84, investigator in malaria and yellow fever and professor emeritus of pathology at Tufts Medical School, Medford, Mass., 16 Nov.; **A. Hyatt Verrill,** 83, author, naturalist, and explorer, Chiefland, Fla., 14 Nov.; **Harold Weintraub,** 31, assistant professor of mathematics at Tufts College, Medford, Mass., 7 Nov.; **John B. Whitehead,** 82, pioneer in electrical research, electronics investigator, former president of the American Institute of Electrical Engineers, professor emeritus of electrical engineering and a founder and former dean of the School of Enginering at Johns Hopkins University, Baltimore, 16 Nov.; **Robert B. Wolf,** 77, engineer, author, and former director of the National Bureau of Economic Research, New Canaan, Conn., 11 Nov.

Meetings

The department of mechanical engineering of the Technological Institute, Northwestern University, has announced the first in a series of symposiums to be conducted under the leadership of the institute's research group in gas dynamics. The theme of the 1955 **Gas Dynamics Symposium,** which is scheduled for 22–24 Aug. 1955, will be *Aerothermochemistry.* The field is so broad, however, that in this conference emphasis will be placed on problems concerned with combustion instability, turbulent combustion, and the modern aspects of laminar flame propagation. Scientific papers, either of an analytic or of an experimental nature, are now being invited for consideration. It is planned to publish all the papers and their discussions in a volume of proceedings that will appear shortly after the completion of the symposium.

Prospective authors are asked to send abstracts of their research papers giving in approximately 300 words a summary of the material they wish to present. *These abstracts should be in the hands of the symposium committee by 31 Dec.* Authors will be informed of

tentative acceptance by mid-January 1955, and complete papers should be submitted by 15 June 1955. Abstracts and correspondence concerning the symposium should be sent to the Gas Dynamics Symposium, Department of Mechanical Engineering, Northwestern Technological Institute, Evanston, Ill.

On 29 Dec. during the AAAS annual meetings in Berkeley, Calif., a 3-D color motion picture with sound, called **"A third dimension for oil,"** will be presented as part of the symposium *Earth Sciences from the Air, Part II* that is to take place in a joint session of Section E-Geology and Geography and the Geological Society of America, cosponsored by the American Geophysical Union. The film will illustrate a paper on the "Status of photo interpretation in petroleum geology" by Robert L. Anderson of Geophoto Services, Denver, Colo. It presents geologic interpretation of air photographs so that for the first time it is possible to see in a movie what a photogeologist sees as he looks through a stereoscope. The film shows many different examples of stratigraphic and structural types.

A joint meeting of archeologists and classical scholars will be held in Boston 28–30 Dec. to celebrate the 75th anniversary of the **Archeological Institute of America,** founded in Boston in 1879. This meeting of the Institute and the American Philological Association will have George M. A. Hanfmann and Cedric H. Whitman of Harvard University as cochairmen of the local committee. Sessions of the meeting, at which recent archeological discoveries will be discussed, will take place at both the Sheraton Plaza Hotel and Harvard University. Nathan M. Pusey, president of the university, will deliver a welcoming address.

Several distinguished authorities will take part in a discussion on the deciphering of ancient Greek writing of 1400 B.C. In a symposium open to the public Rhys Carpenter of Bryn Mawr College, Carl Roebuck of Northwestern University, James A. Notopoulos of Trinity College, Emmett L. Bennett of Yale University and Carl Blegen of the University of Cincinnati will discuss the achievement in the field and its impact on our knowledge of Homer and early Greece.

In addition to reports on recent excavations, a showing of outstanding archeological films has been arranged. William Chapman's views of the prehistoric cave paintings at Lascaux, France, Ray Garner's short film on the cliff dwellings of ancient Indians in Arizona, and the latter's feature film on Egypt will be shown.

The National Science Foundation will award individual grants to defray partial travel expenses for a limited number of scientists who will attend the **International Union and Congress of Pure and Applied Chemistry,** to be held in Zurich, Switzerland, 21–27 July 1955. Application blanks may be obtained from the National Science Foundation, Washington 25, D.C. *Completed forms must be submitted by 1 Feb. 1955.*

The council of the **Oak Ridge Institute of Nuclear Studies** held its annual meeting in Oak Ridge on 19 Oct. 1954. The council, consisting of one representative from each of the institute's 32 sponsoring universities, reviewed the year's activities and discussed the future course of development of the institute. Five members were elected to the board of directors, which manages the institute's affairs. They are Paul M. Gross, vice president of Duke University and president of the institute; George L. Cross, president of the University of Oklahoma; George T. Harrell, dean of the School of Medicine, University of Florida; Edward Mack, chairman of the department of chemistry, Ohio State University; and J. Harris Purks, Jr., provost of the University of North Carolina.

Retiring members of the board of directors are Jesse W. Beams, professor of physics, University of Virginia, and William V. Houston, president of Rice Institute. Under a system set up by the council last year, the board is being expanded to 15 members by adding two members yearly through 1955.

T. W. Bonner, professor of physics at Rice Institute, was elected vice chairman of the council. George H. Boyd, dean of the Graduate School of the University of Georgia, is the council chairman. At a meeting of the board of directors following the council meeting, Dr. Gross was reelected president of the institute and Clifford K. Beck, professor of physics at North Carolina State College, was reelected vice president.

Seventeen nations sent representatives to London 4–8 Oct. for a conference on the support of medical research. The meeting was sponsored by the **Council for International Organizations of Medical Sciences.** Members of the U.S. delegation were Ernest M. Allen, chief, Division of Research Grants, National Institutes of Health; R. Keith Cannan, National Research Council; H. Burr Steinbach, National Science Foundation; and R. F. Loeb, Columbia University. In a report on the meeting that has been submitted to NSF, which financed American participation, Allen observes that agreement was reached by the conferees on these principles: (i) The most favorable environment for research is the university; central or independent research institutes should never be established at the expense of university programs. (ii) To make rigid compartments of "basic," "preclinical," and "clinical" research is unrealistic and harmful. (iii) Research support for nonteaching hospitals is justified provided they maintain a high standard of work. (iv) The investigator should work untrammeled, with freedom to alter course and without an obligation to make reports at too-frequent intervals.

In addition, the conference looked with favor upon part-time research fellowships for medical students and also recommended the establishment of a central research body to serve as a clearinghouse for medical research, to set biological and reference standards, to determine neglected areas requiring particular attention, and to perform other functions.

Education

St. Francis Hospital of Ohio State University, the oldest combined medical college–hospital building in continuous operation in the United States, will close in June 1955. Constructed during the years 1849–1851, it has served as an integral component of the College of Medicine for the training of upper class medical students and interns. Originally occupied by the Starling Medical College, forerunner of the present college, the venerable institution is succumbing to the combined factors of rising costs, restricted location, and the burden of its charity work.

Four broad movements of revolutionary magnitude have substantially altered the basic framework of **engineering education** during the last 25 yr, according to an article in the November issue of *Mechanical Engineering* by Arthur Bronwell, secretary of the American Society for Engineering Education and professor of electrical engineering at Northwestern University. These changes are (i) a substantial strengthening of the mathematics and basic sciences underlying engineering education; (ii) a response to the rapid development of new areas of technology with large-scale commercial application; (iii) increased emphasis upon the development of a balanced educational program; and (iv) a substantial reduction of the time devoted to the teaching of practical skills and techniques.

Bronwell tries to outline the conflicting views that exist among engineering educators on the best methods of coping with the new fields of science in the engineering curriculums, and in conclusion he discusses the difference between acquisition and mastery of knowledge; the intellectual development of engineering students; and the problems of teaching creative thinking to young engineers and of developing leadership qualities in them.

The Institute of Statistics at North Carolina State College is sponsoring a 9-day intensive **training program in statistical methods** for research workers in industry and the physical sciences starting 22 Jan. 1955 and running daily (including Sundays) through 30 Jan. 1955. The course is designed to make available to research workers in industry and the physical sciences the new statistical techniques of data analysis and experimental design. Guest lecturers will include W. J. Youden, Statistical Engineering Laboratory, National Bureau of Standards; Carl A. Bennett, Hanford Works, General Electric Co.; and Cuthbert Daniel, Statistical Consultant, New York. A registration fee of $100 will be charged and enrollment will be limited to the first 50 qualified applicants. For further information write to the Institute of Statistics, North Carolina State College, Box 5457, Raleigh.

The School of Dentistry of St. Louis University announces the introduction of a new graduate course, **"Conservation of the human dentition,"** under the direction of Victor H. Dietz.

Available Grants and Fellowships

Grants from the Permanent Science Fund of the **American Academy of Arts and Sciences** are made in support of research in any field of science whatsoever in amounts normally not exceeding $1500. Applications for grants to be made next March should be *filed by 1 Feb.* on forms available from the Chairman, Permanent Science Fund Committee, American Academy of Arts and Sciences, 28 Newbury St., Boston 16, Mass. Special consideration will be given to projects on new frontiers of science, those which lie between or include two or more of the classical fields, those proposed by investigators who may be on the threshold of investigational careers or who are handicapped by inadequate resources and facilities. The committee does not ordinarily approve grants for research the results of which constitute partial fulfillment of requirements for an academic degree.

Special medical research equipment has been placed in the department of medicine of the **Tulane University Medical School** in memory of the late John E. Monroe, former traffic manager of Pan-Am Southern Corp. The equipment, a large centrifuge and a special microscope, is valued at nearly $2000. It was purchased with money in the John E. Monroe Memorial Fund, which was contributed by 216 friends and associates of the late Mr. Monroe. Both the centrifuge and the microscope will be used in the study of biological fluids of man.

The **Institute of Industrial Health** of the University of Cincinnati will accept applications for a limited number of fellowships offered to qualified candidates who wish to pursue a graduate course of instruction in preparation for the practice of industrial medicine. Any registered physician who is a graduate of a Class A medical school and who has completed satisfactorily at least 2 yr of training in a hospital accredited by the American Medical Association may apply. Experience in private practice or service in the Armed Forces may be substituted for 1 yr of training.

The course of instruction consists of a 2-yr period of intensive training in industrial medicine, followed by 1 yr of practical experience in industry. Candidates who satisfactorily complete the course will be awarded the degree of Doctor of Science in Industrial Medicine.

During the first 2 yr stipends vary, in accordance with the marital status of the individual from $3000 to $3600 in the first year and $3400 to $4000 in the second year. In the third year the candidate will be compensated for his service by the industry in which he is completing his training.

A 1-yr course, without stipend, is also offered to qualified applicants. Requests for additional information should be addressed to the Institute of Industrial Health, College of Medicine, Eden and Bethesda, Cincinnati 19, Ohio.