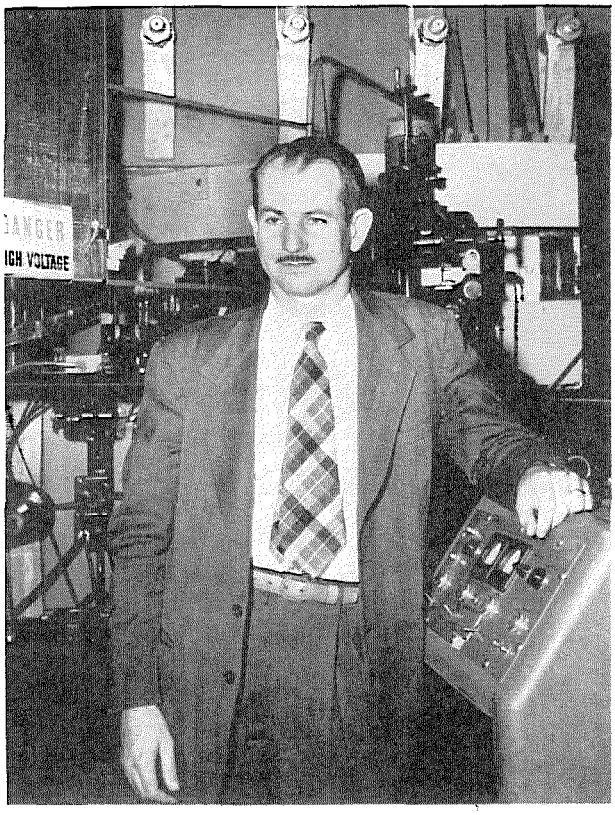

Edwin M. McMillan

THE MONTH AT CALTECH

Nobel Prizewinner

EDWIN M. MCMILLAN, co-winner of the 1951 Nobel Prize for Chemistry, is the fourth Caltech scientist to be awarded this highest of all scientific honors. The others: R. A. Millikan, who received the award in physics in 1923; Thomas Hunt Morgan, honored in 1933 for his research in heredity; and Carl Anderson, whose discovery of the positron won him a physics award in 1936.

Dr. McMillan graduated from Caltech in 1928, received his M.S. here in 1929, and his Ph.D. from Princeton in 1932. In that same year he went to the University of California at Berkeley as a National Research Fellow. He has been on the faculty at Cal ever since, and has been Professor of Physics there since 1946.

Dr. McMillan shares this year's Nobel Chemistry Award with his colleague at the University of California, Dr. Glenn T. Seaborg, Professor of Chemistry—for their joint discoveries of six new radioactive elements used in the development of atomic energy.

There were 92 basic elements when the physicist McMillan and the chemist Seaborg began their work. McMillan then produced a 93rd element, the first one heavier than uranium, which he christened neptunium (Neptune being the planet immediately beyond Uranus in the heavens). He was working toward the creation of element 94, plutonium, when he was called to the Massachusetts Institute of Technology as one of the organizers of the work on radar in 1940.

Seaborg went ahead with McMillan's research project and within a few months he and his associates produced plutonium, which proved to be a vital element in the construction of the atomic bomb. While working on the atom bomb project during the war, and after his return to the University of California, Seaborg produced, one after another, elements 95 (americium), 96 (curium), 97 (berkelium) and 98 (californium).

During the war Dr. McMillan not only worked on microwave radar, but assisted in the development of sonar at the Navy Radio and Sound Laboratory in San Diego, California, and later joined the Los Alamos Scientific Laboratory. McMillan helped Prof. J. Robert Oppenheimer organize the lab for the development of the atomic bomb. He was in charge of early development of the Hiroshima bomb and later worked on the Nagasaki type bomb. He returned to Berkeley in 1945.

In addition to the work which won him the Nobel award, Dr. McMillan is also responsible for the theory of phase-stability, which has made possible the construction of powerful new types of particle accelerators to create matter out of energy—the synchrotron, synchrocyclotron, cosmotron and bevatron.

McMillan and Seaborg are to receive their $32,000 award from King Gustav Adolf in Stockholm on December 10, the anniversary of the death of Alfred E. Nobel. It's the first time that a single American institution has produced two Nobel prizewinners in one year, and it

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means that the University of California's Berkeley campus now has six Nobel winners. The four others: E. O. Lawrence, William F. Giaque, Wendell M. Stanley, and John H. Northrup.

Geochemist

PROFESSOR HARRISON S. BROWN of the Institute for Nuclear Studies at the University of Chicago will join the Caltech faculty about December 1 as Professor of Geochemistry in the Division of the Geological Sciences.

Professor Brown's contributions to scientific progress won him the $1,000 Prize of the American Association for the Advancement of Science in 1947 for his work on meteorites. At the American Chemical Society Diamond Jubilee meeting this fall he was announced as recipient of the $1,000 ACS Award in Pure Chemistry to be presented next spring.

His scientific contributions are all the more remarkable because many of the results of his work from 1942 to 1946 have not yet been published—and may not be for some time. During that period he worked first as a Research Associate on the University of Chicago Plutonium Project and then as Assistant Director of Chemistry at the Clinton Laboratories, Oak Ridge, Tennessee. His contributions here were fundamental to the plutonium process developed for the Hanford, Washington, atomic project.

Brown's main interests have been in problems of the chemical composition of the universe and the planets—which involves work in the fields of chemistry, astronomy and geology. His war duties, however, caused him to suspend this research until 1946, when he went to the Institute for Nuclear Studies and the Department of Chemistry at Chicago as an Assistant Professor. He became an Associate Professor in 1948.

A native of Sheridan, Wyoming, where he was born September 26, 1917, he moved to San Francisco at the age of ten. In 1938 he received the Bachelor of Science degree in chemistry at the University of California. He was awarded the Ph.D. degree in chemistry at the Johns Hopkins University in 1941, after serving his last year in graduate work there as a DuPont Predoctoral Fellow. He then spent a year at Johns Hopkins as an Instructor of Chemistry before taking up his war work. His research at Johns Hopkins concerned the chemistry of the fluorine compounds which were to become important in manufacture of the atomic bomb.

His war work gave him a vital interest in the social problems created by the bomb. Since 1947 he has been Executive Vice Chairman and Trustee of the Emergency Committee of the Atomic Scientists. His book, *Must Destruction Be Our Destiny?* was published the year before. He was co-author of *Years of the Moderns*, published in 1949, and is editing, for the Rockefeller Foundation, the *International Compilation of Meteorites and Their Properties*, to be published in three volumes in 1953.

Harrison Brown

He also has published some 30 scientific papers in the fields of mass spectroscopy, thermal diffusion, fluorine and plutonium chemistry, meteorites, geochemistry and planet structure.

He is a member of the American Chemical Society, American Physical Society, American Meteoritical Association, American Astronomical Society, American Association for the Advancement of Science, Sigma Xi and Phi Beta Kappa.

Postwar research

In the comparatively brief span since Professor Brown returned from his war endeavors to basic scientific research he has laid a theoretical background for relating the composition of meteorites to the earth, other planets and the sun. He has found that the planets of our solar system were formed by condensation at relatively low temperatures from a medium chemically similar to the sun and other stars. A single cosmic catastrophe millions of years ago accounts for all the meteorites which have struck the earth, he believes. In this research Professor Brown has contributed fundamental facts for consideration in any theory attempting to explain the origin of the earth—perhaps our most fundamental geologic problem—and of the entire solar system as well.

"Professor Brown is one of the most brilliant young workers in the field of geochemistry in this country," says Dr. DuBridge. "We feel that his high qualifications as a physical chemist coupled with his keen interest in the geological aspects of this field will bring about a more intimate tie between the earth sciences and the work of our physics and chemistry divisions. This is in keeping with the Caltech tradition that cooperation

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between the various fields of science and engineering provides the most fruitful atmosphere for productive research."

Lewis Medal

PROF. LINUS PAULING has been selected as the first recipient of the Gilbert Newton Lewis Medal of the California Section of the American Chemical Society.

The award commemorates the late Professor Lewis of the University of California, one of America's noted theoretical scientists. It is to be presented to American chemists who have made significant contributions to the theoretical aspects of chemistry.

The Lewis Medal was presented to Professor Pauling at the formal dinner meeting of the California Section in Berkeley, November 27.

The first California Section Medal was also awarded at that time to Professor C. H. Li of the University of California. This medal is to be presented annually to a scientist under 40 years of age who has made a major contribution to chemistry while a resident of one of the eleven Western states.

Dr. Li received the award for his contributions to the knowledge of the chemistry of living matter. He is credited with isolating ACTH, the anti-arthritis hormone, and four other hormones of the anterior pituitary gland.

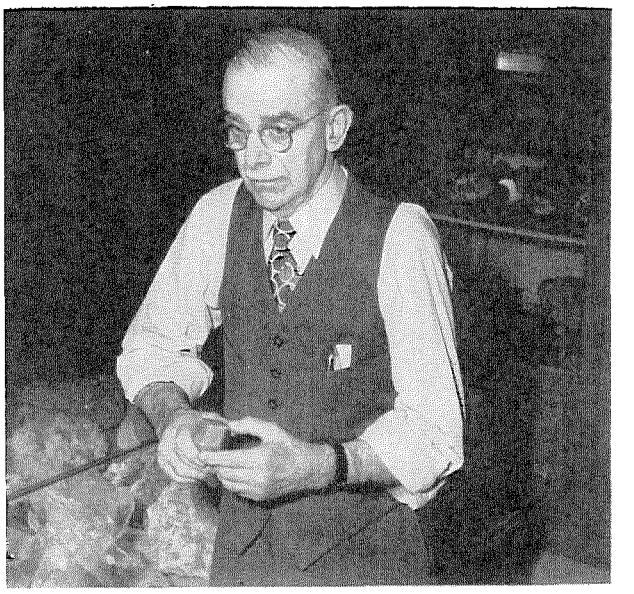
The two awards were established by the Section in celebration of its Golden Anniversary. With a membership exceeding 2,000 it is the fifth largest section of the A.C.S., which has more than 65,000 members and is the world's largest scientific organization. This year is both the Diamond Jubilee year for the Society and the Golden Anniversary year for the California Section.

Geology Collections

THE INSTITUTE'S Geology Division last month acquired the personal library of the late Dr. Chester Stock, who headed the Division until his death last year. The collection consists of about 950 books and some 6,000 reprints of articles on vertebrate paleontology and related fields, including a bound collection of Dr. Stock's 172 published papers.

Dr. Stock started his library when he was a student in 1913. It includes a number of volumes which belonged to the late Prof. John C. Merriam, who taught Dr. Stock at the University of California. The Merriam library was a gift from Prof. Merriam's sons—one of whom, Charles, is Associate Professor of Invertebrate Paleontology at Caltech.

At the same time William C. Oke presented the Geology Division with his extensive mineral collection, consisting of more than 3,000 carefully labeled and catalogued specimens.



William C. Oke, Curator of Mineralogy

Mr. Oke began his mineral collection only 18 years ago, at the age of 50. A typewriter repairman for the Union Oil Company in Los Angeles, he became interested in mineralogy and went to night school to learn more about the subject. He has twice been elected president of the Mineralogical Society of Southern California. Since his retirement from Union Oil three years ago, at the age of 65, Mr. Oke has assisted the Geology Division in caring for its mineral collections, and last summer was named Curator of Mineralogy at the Institute.

The unique Oke collection, which includes many rare minerals from all over the world, will provide the Geology Division with a long-needed reference tool. Mr. Oke intends to add species and varieties to the collection as he acquires them.

Rain and Radar

DR. E. G. BOWEN, physicist member of the Australian Commonwealth Scientific and Research Organization, in a series of lectures delivered at the Institute last month, revealed that Australian scientists had developed a revolutionary new method of rain-making.

Though, in this country, we have concentrated on producing rain by seeding clouds with dry ice or silver iodide, the Australians have been more successful by spraying low clouds with water.

In small-scale experiments, using only a few hundred pounds of water at a time, sprayed from DC-3's, the Australians managed to start rain falling in 15 or 20 minutes which would not otherwise have reached the ground. These experiments have indicated that a single ton of water would yield at least 1,000,000 tons of rain.

The experiments have been on low-hanging clouds—and in Australia 50% of the country's rain comes from

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low clouds. Silver iodide and dry ice proved to be more effective than water in high cumulus clouds, where freezing occurs. In the low clouds, the effect of the sprayed water was to introduce droplets larger than those already suspended in the cloud. The small drops of water attach themselves to the larger ones, which soon become so heavy that they drop to the earth.

The Australians don't plan to go into large-scale rain-making operations until they're positive it is a safe procedure—which means about two more years of basic research.

In all, Dr. Bowen delivered five lectures at the Institute last month. Though two of these were devoted to natural and artificial rain, the others were on "Radio Frequency Radiation from the Sun," "Radio Frequency Radiation from the Galaxy," and "Moon Echoes and Moon Radiation."

Reporting on Australian studies of the radio waves produced by the moon and received continuously on earth, Dr. Bowen revealed that these have given us accurate estimates of the temperatures on the moon. The range is from a high of 158° F. to 145.4° F. below zero, with a mean temperature of 86° below zero.

These temperatures are in line with those obtained in a different way by Dr. Seth B. Nicholson and other researchers at the Mt. Wilson Observatory. These were obtained optically by studying infrared light from the moon.

Australian scientists have also launched a project to bombard the moon with radar waves. In less than a year the researchers hit the moon and received echoes about 25 times. Signals took 2.5 seconds to make the 480,000-mile round trip, which means they went at about the speed of light.

The experiment leaves some doubt as to the possibility of using the moon to reflect messages being sent, say, from Australia to the United States. The echoes received from the moon, in nearly all cases, were extremely blurred. But the technique of bouncing radar waves off of celestial objects might provide an accurate check on our measurements of distance from many of these.

THE BEAVER

A Midautumn Night's Dream

THE WEEK OF OCTOBER 29 to November 2 was filled with more than the usual bustle around the student houses. It was mid-term week, and there was no football game the following weekend. All signs unmistakably pointed toward the coming of the annual Interhouse Dance—even including the traditional rumors about the photographers of *Life* Magazine showing up.

The Interhouse Dance is really five simultaneous dances, one in each of the four houses and one in Throop Club. Every year each house plans its share of the Interhouse Dance around some particular theme or motif. Each has its own decoration, orchestra, dance floor, and refreshments. Couples move around from one house to another, impartially sampling the music and refreshments at each. After this the young lady agrees that the decorations of her escort's house are by far the most original.

A couple beginning at the spot which less than a week before marked the Dabney House courtyard would have found a spectacle rivaling the Grand Canyon in concentrated grandeur and Disney's "Fantasia" in color.

The moonless night hid almost everything but the green luminescent fountain, continuously disgorging itself fifteen feet into the air. A luminescent river without beginning or end flowed along one side of the court, which was filled with pine wood carefully arranged and especially imported for the occasion. The inside of the lounge was peopled with surrealistic creatures peering at the dancers who, in turn, were peering back at them. The mood was heightened by a miniature waterfall on one wall. Intrepid explorers found, by reaching far enough, that the water was real.

Upon leaving the "Black Magic" theme of Dabney, the couple might go to neighboring Blacker House for "A Night in Old Albion." An old English castle was suggested by a moat, drawbridge, and battlement. The court also included "Ye Olde Boar's Head Tavern" (indicating that the boys take their third-year English literature course seriously), and "Ye Olde Kissing Well" (indicating that the boys take their dances seriously). In the lounge, a life-size king in full regalia looked down from his balcony, with the aid of special torch lighting, upon a hall of tapestries and knights in armor.

Ricketts under water

Ricketts House was "Twenty Thousand Leagues Under the Sea." Ricketts court, very often dry in real life, became a part of the ocean floor. A large bathysphere sat in the center of the court, along with a dummy clothed in a diving suit. The effect was embellished, as in all the other courts, by expert lighting. The inside of the lounge was covered with extravagantly colored murals depicting imaginative undersea scenes.

By now the wandering couple must have been almost overwhelmed by grandeur, just as this writer is running