J. Marvin Weller, Professor of Invertebrate Paleontology Emeritus of the University of Chicago, died July 21, 1976, in Greenbrae, California, at the age of seventy-six. His death ended an outstanding father-and-son career. Marvin's father, Stuart Weller, was a prominent paleontologist in the Department of Geology at the University of Chicago during the first quarter of the twentieth century, when the department was considered by many to be pre-eminent in this country. They were perhaps unique in the close parallelism of their careers. Both were outstanding field geologists with a major interest in the Mississippian paleontology and stratigraphy of the Midwest. Both served on the Illinois Geological Survey, where in 1907 Stuart Weller produced the first geologic map of Illinois for the recently established Survey, and Marvin was principal author of the third edition in 1945. Both occupied the chair in invertebrate paleontology at the University of Chicago, where they also served as associate editors of the Journal of Geology.

Marvin was devoted to his father and inspired by his accomplishments. He accompanied his father in field work from the time he was ten years old until he was sixteen, at which age he became the youngest geological employee of the Illinois Geological Survey. By 1927, when Stuart Weller died suddenly of a heart attack while engaged in field in Kentucky, Marvin was the head of paleontology and stratigraphy at the Survey and was already launched in major studies of Pennsylvanian stratigraphy. Later Marvin completed and published much of Stuart Weller's extensive geologic mapping in western Kentucky and southern Illinois.

Both Wellers corresponded with geologists all over the world. Much of their correspondence is preserved in the archives of the Illinois Geological Survey. It shows their wide interests during a period of rapid development of geological science—nearly sixty-five years.

Marvin Weller will be particularly remembered for his contributions to Mississippian and Pennsylvanian stratigraphy and paleontology. He was a contributor to the geological profession in many ways—as chairman of national committees, as long-time editor of two national geological journals, as leader and organizer of many field conferences and symposiums, and as a dedicated teacher.

Marvin was an unusually versatile stratigrapher with the talent, desire, and energy to make important contributions in paleontology, paleoecology, evolution, sedimentation, and stratigraphic principles and practice. He wrote economic reports on the geology of coal, oil and gas, fluorspar, rock asphalt, and lead resources. Marvin made the transition from those early geologists, whose broad interests were based on years of field experience, to the modern specialists, many of whom have limited field experience but are proficient in laboratory technology and mathematical analysis.
He was particularly skilled as a reconnaissance geologist, as shown by the success of his foreign explorations. A necessary complement was the ability to generalize, frequently described as “painting with a broad brush,” at which he was a master.

Marvin was very direct and totally lacking in anything ostentatious. He never “beat around the bush.” He was forceful and candid when defending his ideas. His short, concise answers seemed abrupt, or even brusque, but this timesaving device did not mask his friendly and helpful nature. With those he knew well, he was a most interesting conversationalist with a subtle sense of humor and with many anecdotes about famous geologists and his own adventures in foreign lands.

James Marvin Weller was born on August 1, 1899, in Chicago, Illinois, the son of Stuart and Harriet Marvin Weller. He attended Chicago public schools and graduated from Hyde Park High School in 1917. He was in the United States Army officer’s training school briefly in 1918. From the University of Chicago he received a B.S. degree with honors in 1923 and a Ph.D. in 1927.

Marvin was a member of Phi Beta Kappa, Sigma Xi, Kappa Epsilon Pi, Phi Gamma Delta, the Paleontological Society, the Geological Society of America, the American Association for the Advancement of Science, the American Association of Petroleum Geologists, and the Society of Economic Paleontologists and Mineralogists. He was president of the latter society from 1964 to 1965 and was made an Honorary Member in 1970.

Marvin was a field assistant for the Illinois Geological Survey from 1916 to 1918 and an assistant geologist in charge of mapping the Campbell Hill quadrangle in southwestern Illinois in 1919. From 1920 to 1922 he was employed by the Whitehall Petroleum Corporation of London for work in the Punjab area in India, now part of Pakistan, where he mapped geologic structures and described Tertiary stratigraphy, the subject of one of his earliest publications. In 1923 he worked for the Chanute Spelter Company, a subsidiary of American Metals Company, investigating the possibilities for lead mining in Ste. Genevieve County, Missouri.

In 1924 and 1925, Marvin worked for the Kentucky Geological Survey, mapping and describing the general geology of Edmonson County, Kentucky, as his Ph.D. thesis. The area includes Mammoth Cave, then the most famous cave in the world. He described it and other caves and made the first major attempt to work out the principles that govern formation of the caves in that region. In this publication he also described the Kentucky rock asphalt deposits, which were then becoming the source of a large industry.

When Marvin accepted the appointment as paleontologist for the Illinois Geological Survey in 1925, his first assignment was to study the paleontology and stratigraphy of the Pennsylvanian rocks. He spent much of the first three field seasons studying exposures and collecting fossils all over the state (375 collections). In this work he became aware of the regular order of repetition of the faunas and lithologic units and the wide distribution of the individual units throughout the state. The repetition of many lithologic types in the Pennsylvanian succession had been noted by the middle 1800s. In 1912 J. A. Udden described cyclical units in the Peoria region in Illinois. However, the regular order and wide extent had not been generally recognized.

At the same time, Harold R. Wanless was studying the Pennsylvanian stratigraphy of western Illinois, and he also recognized the cyclical arrangement and persistence of many units. Both Weller and Wanless soon became convinced that these units were important for correlations, for geologic mapping, and for understanding the origin of the sediments, and that they needed recognition as formal units. In 1932 they jointly introduced the term "cyclothem" for the cyclical units.
As part of the Quarter Centennial Celebration of the Survey in 1930, Marvin organized a symposium on cyclical sedimentation during the Pennsylvanian Period, at which nine stratigraphers and paleontologists presented papers with differing concepts on regions from Pennsylvania to Texas.

In a 1953 paper in paleoecology (GSA Memoir 67, 1957), Marvin summarized his ideas on ecological factors and their importance in controlling the composition and distribution of the biota and described the characteristics and peculiarities of each of the generally recognized members of the Pennsylvanian cyclothem as developed in Illinois. Weller and Wanless considered the cause for the cyclothems to be largely tectonic. Later, Wanless and F. P. Shepard suggested eustatic changes in sea level, possibly caused by repeated glaciations in the southern hemisphere, as the major cause for the cyclothems. Others have suggested modifications or new theories, some placing major emphasis on climatic control in the source areas. Marvin steadfastly supported the tectonic theory (although he noted its problems and the strong points of other concepts) in a major paper in 1956. His final publication on cyclothems, in the *Encyclopedia Britannica* (1974), is an excellent summary of the physical characters of the cyclothems and the theories of origin.

The reports of Weller and Wanless stimulated interest in Pennsylvanian stratigraphy and cyclical sedimentation, and a large amount of literature on regional variations in the cyclothems has resulted. Although the characteristics of cyclothems and many aspects of their origin are still debated, cyclothems are firmly entrenched in Pennsylvanian stratigraphy.

During the years of intensive field studies, Marvin used the winter seasons to study the fauna, and he published ten papers on Pennsylvanian gastropods, crinoids, brachiopods, sponges, and ophiuroids.

In 1937 and 1938, Marvin was on leave from the Survey to conduct a geological investigation for a Chinese syndicate that had a concession on the mineral rights in a large area in Kansu, Chinghai, and Sinkiang Provinces of northwestern China. He fortunately arrived just ahead of the Japanese invasion of China, he witnessed Japanese air raids on Lanchow and Sian, and he was less than 100 miles from the battle front when the Japanese advanced to the Yellow River. Rather miraculously he completed two long traverses through the mountains and plateaus of northern Tibet and along the southern edge of the Gobi Desert supported by one American geologist, Fred Sutton, and a party of nine Chinese. After weeks of delays and many exciting experiences, he left China by the “side door,” through Chungking and by steamer down the Yangtze River to Hankow (then the capital), narrowly missing a severe air raid that destroyed the ship ahead. From there he flew to Hong Kong and sailed for home by way of Europe. His recommendations resulted in the discovery of the oil field at Shihyuhuo, which was for the Chinese the only domestic source of oil during the war. On returning, he published several papers on the oil prospects of the region and an outline of Chinese geology.

Marvin returned to Mississippian stratigraphy and, with A. H. Sutton, published several papers on Chesterian correlations in Kentucky and Illinois. Their studies culminated in 1940 in a major report on the Mississippian border of the Eastern interior region. This report contains geologic maps of southeastern Missouri, southern Illinois, western Kentucky, and southern Indiana, compiled from the work of several geologists, including unpublished maps by Stuart Weller.

Mostly from his father's early mapping, Marvin compiled the geologic maps for seven quadrangles in southern Illinois, and they were published with summaries of the stratigraphy in three reports.

The discovery in 1937 of many new oil fields in the deep part of the Illinois Basin
stimulated interest in the oil possibilities of extreme southern Illinois. Already familiar with much of the Mississippian and Pennsylvanian stratigraphy, Marvin restudied the entire Paleozoic, Mesozoic, and Cenozoic succession and made numerous new interpretations of the geology of the region. Twenty years later, his conclusion that the prospects for commercial oil and gas in extreme southern Illinois are, on the whole, not particularly favorable has not been disproven.

In 1940 Marvin organized a symposium on Devonian stratigraphy of the Mississippi Valley as part of a program dedicating the State Natural Resources Building, which houses the State Geological Survey. The papers by eleven stratigraphers from seven states were published in 1944 in a Survey bulletin. In summarizing papers, G. Arthur Cooper and Marvin outlined and suggested answers to the major problems in Devonian correlations.

Marvin was made editor of the *Journal of Paleontology* for the Society of Economic Paleontologists and Mineralogists in 1942 and, after moving to the University of Chicago, he continued in that position until 1952. During these years he published many short articles and notes discussing current problems in paleontology and stratigraphy. He wrote more than forty reviews, which also gave him an opportunity to express his views. The experience added greatly to his stature in the profession. One geologist wrote, "Your shorter papers in the *Journal of Paleontology* are the best reading that the journal affords." A zoologist wrote, "Your paper on 'Fatuous species and hybrid populations' should have been the lead article in the *Journal of Paleontology*, rather than buried in the notes. The admonitions should be heeded by all young paleontologists and zoologists as well."

One of his shorter articles (1947), emphasizing the close relationship of paleontology to geology, touched a sensitive spot and elicited strong dissents from those favoring closer ties with zoology and those favoring an essentially independent paleontology. Marvin said that the paper received more favorable comments than anything he ever wrote, and one professor stated that the article was a must for every student in paleontology. On the other hand, a Russian paleontologist was so incensed that he expressed his very low opinion of the author. Marvin commented that "It is interesting that my little paper should give additional evidence of capitalistic degeneracy." This was the exception to years of friendly correspondence with other Russian geologists.

In 1933 Marvin was appointed a member of the Committee on Stratigraphy of the National Research Council, which was organized to prepare the correlation charts of the various stratigraphic systems, published by the Geological Society of America. After ten years of study, the Pennsylvanian Subcommittee, with R. C. Moore as chairman, published in 1944 an excellent chart in which H. R. Wanless, J. Marvin Weller, and J. Steele Williams were listed as chief assistants to the chairman.

In 1944 Marvin was appointed chairman of the Mississippian Subcommittee. In eleven years this committee had made only a little progress toward preparation of a correlation chart and was lagging behind others. Marvin believed that committee members would not contribute original material for the chart in acceptable time but would be quick to criticize a preliminary draft. Therefore, he wrote for information directly to over 400 geologists who had experience in the Mississippian stratigraphy of North America. He received enough support to merit listing 125 of them in acknowledgments in the final report. From these contributions he prepared correlation charts of each region. He received excellent support from his fifteen-member committee and many others in revising and correlating the columns, and by 1948 the final chart and report, the largest in the series, was published.
From 1942 to 1945, as part of the war effort of the Survey, Marvin with Robert M. Grogan and Frank E. Tippie, in cooperation with several Federal agencies, studied the fluorspar deposits of southern Illinois. The primary objective, which was accomplished, was to maintain the production of much-needed fluorspar. This resulted in a bulletin, published in 1952, describing the types of deposits, exploration methods, mining and milling, and the geology of the various mining districts.

Marvin made many other contributions to the geology of Illinois, including (with the help of others of the Survey staff) a new state geologic map. He organized and led numerous field conferences. He led the first Tri-State (Illinois, Iowa, Wisconsin) Field Conference in 1933, which was organized by M. M. Leighton, A. C. Trowbridge, and W. H. Twenhofel. He led several other Tri-State conferences. He was a contributor to the guidebooks of the 9th (1935), 12th (1938), 13th (1939), and 15th (1941) field conferences of the Kansas Geological Society. He organized and led field conferences held in conjunction with meetings of the American Association of Petroleum Geologists and the Geological Society of America in Chicago and St. Louis and several field trips for high school teachers of geology. He was frequently consulted on stratigraphic aspects of economic and engineering problems in Illinois.

Marvin had always wanted eventually to follow in his father's footsteps as Professor of Invertebrate Paleontology at the University of Chicago, and when the call came in 1945, he could not pass it by. Nevertheless, he left the Survey with considerable regrets, partially because of his long friendship and high regard for M. M. Leighton, the Chief of the Survey. Shortly before leaving he wrote to a friend, "I am proud of our Survey and of my part in it."

The change from the concentrated efforts on research at the Survey to the life of a professor was not an easy one, and he stated that the first two years at Chicago were the hardest of his life. He was stimulated, however, by association with outstanding scientists at the university, many of whom he had known for years—a few even in his college days. The thorough and systematic review of the various fields of stratigraphy needed for his courses continued through the years and eventually led to his writing two books.

In addition to teaching, Marvin continued editing the Journal of Paleontology through 1951, added an associate editorship of the Journal of Geology (1945 to 1957), and continued his projects for the National Research Council, including chairmanship of the Commission of Stratigraphic Paleontology in 1951.

After the Mississippian correlation chart was completed, Marvin organized a symposium on problems of Mississippian stratigraphy and correlation for the meeting of Section E of the American Association for the Advancement of Science in Chicago in 1947. The papers by thirteen prominent stratigraphers were published together in the Journal of Geology and have been widely used.

Marvin's interest in trilobites reached a point where he felt that the need for improved organization was essential to further progress. Consequently, he undertook the task of compiling a bibliography of all trilobite generic names. By 1950, with the help of correspondents all over the world, he had a bibliographic catalog of about 2,500 names, and he had studied and redescribed the types of all the Carboniferous trilobites known in the United States. His desire to complete a monograph on the Carboniferous and Permian trilobites was not realized, but he wrote seven papers on trilobites, ranging from descriptions of genera and classification problems to an analysis of trilobite generic nomenclature and its implications regarding progress in paleontology. In the latter article, he emphasized the need to shift emphasis from taxonomy to three overlapping
fields: (1) the investigation of fossil populations with regard to their geographic and stratigraphic distribution and variations, (2) the investigation of the environmental relations of fossil populations with regard to their biological and physical associations, and (3) the investigation of evolutionary trends in closely related sequent populations from precisely determined stratigraphic zones. He concluded that a new generation of students might have to be trained before such fundamental problems could be investigated effectively.

Marvin was a contributor to the *Treatise of Invertebrate Paleontology, Arthropoda*, volume 1, published in 1959. His part dealt largely with Mississippian to Permian trilobites.

In 1958 Marvin reviewed the complex problem of facies nomenclature and proposed a simplified classification that has been widely used. He discussed twenty-one facies names and concludes that the only important names applied to sedimentary rocks are "facies" and "lithofacies" and to environments "lithotope" and "biotope." Six other terms might be considered for special situations, but they had little practical value and should be avoided. All other terms could be rejected without loss.

His interest in sedimentation led Marvin to a lengthy study of the theoretical relations between compaction of sediments and depth of burial. In 1959 he published a critical analysis of all the data he could obtain from the literature and from extensive correspondence. He gave a new porosity-depth curve for mud and shale but concluded that for sandstones no consistent relation exists between porosity and depth of burial; that the consolidation of limestone is not understood; and that the compaction of organic material, such as coal, is a complex process involving both elimination of pore space and loss of substance by chemical decay and metamorphism.

Marvin was chairman of the Glossary Review Committee that added 4,000 additional terms and some revisions of definitions for the second edition of the *Glossary of Geology and Related Sciences*, which was published in 1961 by the American Geological Institute. This edition served the profession until the current, greatly expanded glossary was brought out in 1972. Marvin was a contributor to all three editions.

From 1952 to 1954 Marvin was on leave from the university to conduct a survey of coal resources in the Philippines for the Mutual Security Agency and Foreign Operations Administration of the U.S. Geological Survey. He took an active part with Philippine geologists in five projects; reports on these were published by the Philippine Bureau of Mines. He also supervised five other projects. This study gave him a firsthand knowledge of Tertiary coal basins, a renewed enthusiasm for applied stratigraphy, and another excursion into little known areas.

Marvin was on leave again briefly in 1956 to serve as a visiting professor at the University of Texas.

After several years of teaching, Marvin became convinced of the need in stratigraphy for a book not emphasizing sedimentary petrology, but one that recognizes stratigraphy as the heart of the geologic sciences and its broad consideration of the scientific and philosophic aspects of geology—"the common meeting ground of all geologists." His book *Stratigraphic Principles and Practice* was published by Harper and Brothers in 1960. Except for a historical introduction and an appendix covering graphic representation and field work, the text concerns the nature and interpretation of the materials of stratigraphy and the relations, classification, and nomenclature of stratigraphic bodies. The book emphasizes the practical considerations that dominated the philosophy of its author. Perhaps not all will consider as entirely practical his list of special qualities required of a successful field geologist—a strong physique, knowledge
and love of nature and the outdoor life, adaptability, basic training and experience, planning and executive ability, and diplomacy and tact.

Shortly before his death, Marvin essentially completed a manuscript for a book on paleontologic principles and practice, a companion volume for his *Stratigraphic Principles and Practice*. This manuscript is in the rare books and manuscripts collections of the University of Illinois Library, and a copy is in the files of the Illinois State Geological Survey.

Marvin’s second book, *The Course of Evolution*, McGraw-Hill, 1969, expressed his belief that there was need for a greater emphasis on evolution in the teaching of paleontology. The book was designed to show the way that plants and animals have changed during half a billion years. It is on the intermediate level between the popular books on evolution and the highly specialized treatises on the subject. Much morphologic information is given in numerous illustrations. This book was Marvin’s last major contribution to geology, and it is fitting that his concluding remarks on human evolution and the future should express so clearly, and regretfully, the implications of a lifetime of research.

If population increase is not checked in time, the high plateau of accomplishment may be only a brief episode to be looked back upon perhaps as the golden age of human attainment. . . . If worse comes to worst, the human race is likely to begin a long spiral, reproducing in reverse the history of its rise from barbarism. . . . Natural selection will again direct his evolution in older adaptive ways, but the rebirth of an advanced culture comparable to the present one will be impossible, because the necessary, easily obtained natural resources will have been thoroughly depleted.

If all goes well, however, and man uses his wisdom and abilities in constructive ways, the human race has a long future to look forward to.

Marvin’s thesis is not a message of doom, but it is a clear warning of danger ahead if the human race fails to heed soon the lessons taught by the trends of evolution.

As a teacher Marvin was dedicated to developing a sound knowledge of basic information, a critical understanding, and the ability to write. Conciseness and clarity in scientific writing was required. His students admired and respected him for the high standards that he sought, and many of them remained close friends long after their university days. Matthew N. Nitecki has expressed the high regard of one former student in his 1977 memorial to Weller (American Association of Petroleum Geologists Bulletin, v. 61, p. 279–284).

On September 28, 1923, Marvin married Phyllis Vincent Gothwaite, his sweetheart since the seventh grade. It was a happy relationship that continued undiminished throughout his life. With Phyllis and their daughter Harriet, he enjoyed a happy and inspiring companionship. The excellent illustrations in both of his books were prepared by his daughter. Many friends and colleagues enjoyed the social life of their home.

Marvin found time for many activities. He was a master of all trades—carpenter, plumber, electrician, and artisan. After their table silverware, a wedding present, was stolen, he made a beautiful hand-hammered set to replace it. For his daughter he built an accurate model of the home they had built in Urbana. He continued to make additions to a stamp collection started by his father, and he worked occasionally on a coin collection. He was interested in investment as a hobby and closely followed the markets. In his early days at the University of Illinois, he belonged to a theatre guild and performed in faculty plays.

Marvin retired from the University of Chicago in 1965, moving his office to the
Field Museum of Natural History where he was a research associate. His activities were restricted by failing health, and in 1966 he and his wife left for California to live near Harriet. He is survived by his wife, daughter, and a brother, Allen S. Weller, Professor of Art Emeritus and former Director of the Krannert Art Museum at the University of Illinois, Urbana.

Marvin will be missed by many geologists and friends throughout the world. It can best be said of Marvin what T. C. Chamberlin and R. C. Moore said of Marvin's father, "The loss that we all feel does not dim—rather it makes clearly revealed—the enrichment of geologic science and the added joy of companionship in research that have come through the life of Stuart Weller."

Like his father and brother, Marvin was tall and broad shouldered. Those of us who enjoyed field work with him will not soon forget the long strides that carried him across the fields ahead of us, nor the ease with which he stepped over fences we had to climb. But, most of all, we will remember his unfailing skill and enthusiasm in dealing with the problems presented by every outcrop.

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