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# Memorial of William Thomas Pecora
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*One of our white hats is missing,—*
*One of the large ten-gallon size—*
*And we have so few!*
*We shall miss him in the arena*
*Where he bulwarked our defenses*
*And rallied our charges;*
*And we shall miss him in*
*The councils of the wise,*
*Where he sat no lower than*
*The highest. And most of all*
*We shall miss him in the real things.*
*Ever ready with a smile*
*Ever ready with laugh or needed frown,*
*Big enough to humble the tall,*
*Too big to cast down the small,*
*He leaves our midst too soon.*
*One of our white hats is missing—*
*We remember and go on.*

This bit of blank verse was written a few days after Bill Pecora's death. It is not the work of a great poet; it is not polished; it was never intended for publication. It was written spontaneously by a close friend and colleague, and I quote it here because it expresses so well what many of us felt when Bill Pecora left us. He was indeed one of our "white hats"—a scientist, a leader, and a statesman whose career was nipped at its peak. The voices of reason and humanity are sometimes all too few in our hectic world, and Bill Pecora was a stalwart on both counts. In a memorial to Bill Pecora at the Geological Society of Washington, of which Bill was a former president, Monte Klepper described him as "a man of many facets, all of them brilliant cut." I cannot improve on those words.

Most geologists are acquainted with the Pick and Hammer Society, more specifically with its annual shows, in which the Geological Survey pokes fun at itself, and especially at any of "the brass" who may have become a little too pompous or overbearing. Bill was an inveterate performer in Pick and Hammer in his early days on the Survey; and finally, when he rose to positions which banned him from the stage because of "conflict of interest," he was an equally inverterate member of the audience. In these later days the actor chosen to emulate Pecora on the stage was usually advised as follows: "Bill has so many mannerisms, including the well-known 'heh-heh', that he seems to be easy to mimic, but he is a complex and many-sided individual and to play his part you must study Pecora the scientist, Pecora the politician, Pecora the statesman, Pecora the clown, and Pecora the man." He was all of these in the best sense of each.

William Thomas Pecora was born in Belleville, New Jersey, on February 1, 1913, the son of Cono and Anna (Amabile) Pecora. His early schooling was all in New Jersey; he completed his high school education in 1929, and received a scholarship to enter Princeton. There he took the elementary course

in geology and his future was decided. The great Princeton faculty of those days consisted of names that included, among others, Sampson, Howell, Phillips, Thiel, and Buddington, and Pecora soon fell under their spell. But while Bill was an excellent student, he found time to engage in many other undergraduate activities, most notably fencing, a sport in which he became so proficient that he was a member of the American Olympic Team.

Upon receiving his Bachelor of Science degree from Princeton in 1933, Pecora accepted a fellowship and entered graduate school at Harvard where he encountered an illustrious faculty that included men like Billings, Bryan, Berman, Graton, Larsen, McKinstry, and a young tyro named Francis Birch. As a budding petrologist of course Bill Pecora's main inspiration was Esper Larsen.

Upon completion of his formal work at Harvard in 1939 (his PhD was awarded in 1940), Bill joined the United States Geological Survey, starting what was to become a lifetime of service to science and the public. From here on his career can be conveniently divided into three parts—scientist, leader, and politician-statesman.

Bill's later eminence and brilliance as a scientific leader and statesman tend to make us overlook the really outstanding scientific contributions of his early days on the Survey. Although he considered himself primarily a petrologist, he earned a well-deserved reputation as a geologist whose interests were broad and who made substantial contributions to the study of pegmatites, lateritic nickel deposits, phosphates, and alkalic igneous rocks. Especially notable was his work on the nickel deposits and pegmatities of Brazil. But of course it was in the Bearpaw Mountains of Montana that he found his real love and made his biggest contributions in the study of the intrusive rocks, the associated sediments, fractured cobbles, and, finally, in the study and review of the carbonatite problem. His searching thoughts on this topic led not only to a new understanding of these unusual rocks, but also to the establishment of a framework to guide the search for the rare earth elements.

Indicative of Bill's ability to get to the heart of the problem was an incident that occurred while he was leading a field trip through the Bearpaws. The trip included stops at outcrops of fractured cobbles in the Eocene conglomerate around the margins of the mountains, and there was a great deal of discussion on how these cobbles could have been fractured *in situ* without any more regional deformation than about a 15°–20° tilting of beds. One of the eminent structural geologists present pronounced it the result of "differential stress," and many of the participants were duly impressed until Bill gently remarked, "Well, I think perhaps that's right, but what does that tell us that we didn't know already?"

Another measure of his scientific stature was his tour of duty as a member of the Advisory Panel for Earth Sciences of the then young National Science Foundation. So highly were his services on that panel valued that, when Harold Urey was forced to miss a couple of meetings, the general reaction was "well it's too bad Harold can't be here, but we have Bill Pecora."

It was during these years also that Bill established himself firmly as performer *par excellance* in the Pick and Hammer shows. Who can fail to remember with a chuckle his role as "Claribel" with her mop wig and soft shoe dancing?

In 1957 Bill entered what we can call the second phase of his career when he became chief of the former Branch of Geochemistry and Petrology. By this time Bill had come to realize that, eminent as the Geological Survey was, its well-deserved reputation was based primarily on its outstanding ability in classical geology, and the winds of change were blowing. He therefore used his new position as an opportunity to strengthen some activities and launch new ones in areas where he felt the Survey needed to move ahead. The Survey's currently strong programs in Geochronology and Experimental Petrology and Mineralogy owe not only their vitality but perhaps their very existence to Bill's efforts in his early years of science administration. But more important was the fact that Bill did not go overboard on either side. He always realized that the name of the game was to solve geologic problems using all available tools, and he never ceased to encourage projects that combined the use of both field and laboratory in the solution of these problems.

Bill's demonstrated ability for leadership and direction of scientific programs seemed to have pointed him permanently toward a career of even increasing administrative responsibilities, but fate was to intervene. While on a visit to Princeton (he was already a member of his Alma Mater's departmental advisory council) he was stricken with an acute attack of diverticulitis, a functional disease of the intestines. Oddly enough, until this time Bill had had no inkling that his digestive tract had a problem, but the first

attack was so severe that he ended in the hospital with an acute abdominal infection. Recuperation took the better part of a year, and he was advised to forsake administrative burdens, for diverticulitis, like many another alimentary ailment, is aggravated by tension. In 1961, therefore, Bill moved back down to the ground floor of the old Survey building and resumed work on the rocks of his beloved Bearpaws.

In 1964 I offered Bill Pecora a job. In view of subsequent events that seems humorous and even presumptuous; but the real twist is that he very nearly accepted it. I saw a good deal of Bill those days and he felt at a crossroads. He did not intend to get back into administration; and, as devoted as he was to the Survey, he was seriously considering a try at life in the Halls of Ivy. Therefore, when we had a sudden vacancy in the Earth Sciences Section at the National Science Foundation I lost no time in inviting Bill to take a leave of absence from the Survey and become our "Mr. Geochemistry." While serving at NSF he could explore the possibilities of the university position at leisure. About three weeks later Tom Nolan asked him to become the new Chief Geologist of the Survey. The offer had been quite unexpected and the decision to accept it involved a lot of soul-searching. And if I ever came close to repaying the many acts of kindness and friendship that Bill did for me it was by acting as a listening post and a foil during this time of decision. Although we were all concerned about his health, I rather hoped he would accept the job because I did not believe that the sorts of tensions involved at that level would be as hard on him as were those of being a branch chief. For Bill was really a big softee inside. Intellectual battles or struggles with "the bad guys" —the types of problems that are more common in higher administrative levels—didn't bother him. As a matter of fact, he enjoyed the rough and tumble of a real controversial issue. What really cut Bill up inside were the human problems—having to tell nice guys "No."

So began in 1964 the third and probably most significant phase of Pecora's career, that of scientist-politician-statesman. He had been Chief Geologist only one year when Tom Nolan stepped down as Director of the Survey and Bill was just about everybody's first choice to succeed him. Nor did he step in at an easy time. Washington is always stirring with reorganizations or potential reorganizations, and Bill was hardly in Director's chair before it became apparent that a strong move was underfoot to fragment the Survey. Although many considered this almost a foregone conclusion, it was characteristic of Bill that he jumped in with both feet and, largely due to his vigorous efforts, the organization of the U. S. Geological Survey was preserved intact. It was during his years as Director and his all too short term as Undersecretary of the Interior that Bill's truly great stature began to emerge. He faced controversy squarely, seeking out relevant facts among all of the smoke screens and side issues, and he made his decisions invariably on the basis of what he considered to be in the public itnerest. In the early days of the Alaska pipeline controversy, he quickly took the stand that the oil of Alaska's north slope was vital to the nation and was needed as soon as possiible. On the other hand, early attempts at design of the pipeline were inadequate, and he strongly opposed approval of construction until the technical problems were resolved so that the resource could be developed without undue harm to the environment. For Bill was a conservationist in the true sense of the word. His own words, recorded in the *Congressional Record* of March 21, 1972, state his philosophy better than I or anyone else could.

> *A conservation ethic requires a better understanding of the natural base line before rigorous actions are taken out of apprehension and ignorance. Science and research are needed more than ever to provide guidance to courses of national action aimed at fulfilling human needs. As the most intelligent species on earth, man can certainly provide for himself and yet prudently protect the total ecosystem from unnecessary and unacceptable degradation.*

This was Bill's basic philosophy and it colored not only his decisions but his recommendations to three Secretaries of the Interior under whom he served. He played an important part in decisions on the problems of offshore oil development, including not only the Santa Barbara spill but also later problems in the Gulf of Mexico. While Director of the Survey he pressed vigorously and successfully for far-reaching programs to meet forthcoming national needs. He foresaw the impending energy problem many years before it arrived, and he never ceased to push strongly for measures that would help alleviate the crisis when it would come. The fact that he was less than a hundred percent successful in this area is due not to his failure but rather to the failure of others to listen.

Overriding the objections of skeptics, he realized the potential of remote sensings from satellites to acquire data about the earth and its resources more rapidly and economically than by conventional means. It is due largely to his support and encouragement that the Earth Resources Observation Program was finally launched. In a way it is tragic that Bill Pecora did not live to see the first resources satellite in orbit, and yet it is fitting that this first bird was flown the day after his funeral.

The measure of Bill Pecora's ability and his importance and value to the nation were readily apparent in his dealings with Secretaries Hickel and Morton of the Interior Department and with various legislators on Capitol Hill. Anyone who has read Wally Hickel's book *Who Owns America* will sense immediately the affection and esteem that Secretary Hickel had for Pecora; and it is therefore significant that soon after Rogers Morton became Secretary he nominated Bill, a "Hickel man," to be Undersecretary of Interior, the first career scientist to be in that position.

Although Bill's life and career were based primarily in the Geological Survey and the Department of Interior, his activities spanned a broad spectrum of interests and organizations. As Monte Klepper has noted, Bill was not generally regarded as an educator, but was in truth an educator in a very real sense, bringing awareness of problems about the earth, its resources and environment, to a broad and influential cross section of the American public. He made many addresses and statements before scientific and technical committees, Congress, and in other public forums; and he presented forcefully his enlightened conservation ethic as a method of dealing with vital issues of land and resource development. He was a member of numerous scientific societies but none was closer to his heart than the Geological Society of Washington. He received honorary degrees from Franklin and Marshall College and from the Colorado School of Mines. He was a past president of the Cosmos Club and a member of the National Academy of Sciences.

But in all of Bill's affairs, professional and personal, the thing that constantly surfaced was his ebullient and buoyant personality, his never failing sense of humor, and his propensity for using that humor to relieve tensions, accomplish the seemingly impossible, and just make people feel good. The antics and jokes of Pecora were sure to liven up an otherwise austere gathering. One of our favorite Pecora stories has already been cited by Vince McKelvey but is worth repeating. Shortly after he became Director of the Geological Survey, Bill was a speaker at a conference whose other participants included two presidential science advisors and the President of the National Academy of Sciences. Bill began his term by addressing these august personages as Your Highness, Your Excellency, and Your Worship. The meeting never recovered any artificial dignity after that.

I remember another incident, not so well known, which occurred during one of the numerous crises surrounding the offshore oil spill at Santa Barbara. Bill was Undersecretary at the time and the Geological Survey was in effect on a twenty-four hour alert. It was a Saturday and Bruce Hanshaw had "the duty" at Survey headquarters. Early in the afternoon Bruce received a call, the sum total of which was "get your butt over to Secretary Morton's office on the double." Amid great agitation, Bruce assembled all of the papers and maps that he thought might be pertinent and hastened through the tunnel that connected the General Services Building to the Department of Interior, timidly entered the Secretary's office to find Mr. Morton and Bill Pecora, the latter smoking a large cigar, feet up on the desk watching television. "You just made it," said Bill, "It's the eighth inning and the score is tied."

Bill is survived by his wife and helpmate Ethelwyn ("Wynn") Carter Pecora, a son William C. and a daughter Ann S. He is sorely missed by them and many more. A wise man once stated: "It is not *how long* a man lives but *how* he lives that is important." And Bill Pecora lived life to its fullest.

So to William Thomas Pecora, scientist, statesman, and friend, *Salve atque vale.*

Author's Note: A number of other memorials to W. T. Pecora will be published at or about the time this is printed. Some of these will give a more detailed chronolgy of the facts of Bill's life. I have tried, albeit poorly, to interject a little more of the personal note and concentrate more on Pecora the Man. I have therefore not included a complete bibliography, and for this the reader is referred to the memorial by V. E. McKelvey to be published in 1974 by the Geological Society of America.