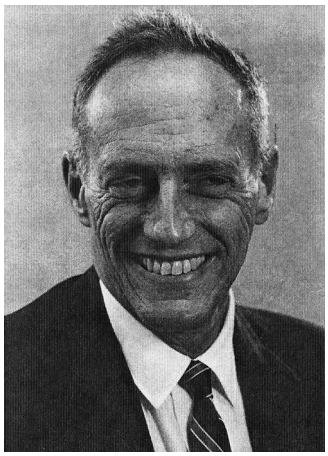
Ben Eiseman, MD (1917–2012)

James G. Chandler, MD, Ernest E. Moore, MD, Bruce C. Paton, MD, W. Gerald Rainer, MD, John Q. Gallagher, MD, Marvin Pomerantz, MD, *and* **Lawrence W. Norton, MD**



"For unto whomsoever much is given, of him shall be much required; and to whom men have committed much, of him they will ask the more." –Luke 12:48; King James Version

Ben Eiseman was born in St. Louis, Missouri, on November 2, 1917, as one of eventually five children of parents, whose marriage merged the northern mercantile interests of *Rice-Stix Dry Goods* with those of Godchaux's Louisiana cane sugar farms, local rail lines, and deep water shipping. John F. Kennedy was almost 6 months old, and America had entered the European War on April 6, changing the balance of back-and-forth trench warfare to achieve the World War I armistice 9 days after Ben's first birthday.

His parents organized both primary and secondary private schooling for their children and those of their friends and neighbors with similar means and goals. They also fostered dinner table conversations emphasizing intellectual curiosity; lifetime learning; a work-hard, play-hard ethos; and responsibilities that come with privilege. Ben followed his father's and many of his mother's family's footsteps into Yale, graduating in 1939 after summer vacations pitching Wyoming hay, deck handing on seagoing ships, or working in Louisiana and Central American cane fields (Fig. 1). He came close to detouring to one of these avocations at the end of one summer and seriously considered foreign service before deciding to become a tropical medicine physician.

His choice of Harvard rather than Yale for Medical School was attributable to a personal interview with its dean that focused primarily on Ben's Central American adventures but curiously omitted inquiry into why he wanted to become a physician. The dean must have had advance knowledge, as 10 days later, Ben was admitted to the class of 1943. [N.M. Rich, W.H. Pearce, W.G. Rainer for the Society for Vascular Surgery (SVS), "Interviews with Pioneers of Vascular Surgery." unpublished Eiseman interview, May 2012, courtesy of James S. T. Yao]. The infamy of December 7, 1941, made Ben and nearly all of his first-clinical-year classmates eager to use their new knowledge in

From the Department of Surgery (J.G.C., E.E.M., B.C.P., W.G.R., J.Q.G., M.P., L.W.N.), School of Medicine, University of Colorado; and Denver Health Medical Center (E.E.M.), Denver, CO.

Address for reprints: James G. Chandler, MD, University of Colorado Denver, Division of Cardiothoracic Surgery, Mail Stop C310, Academic Office 1, 12631 E 17th Ave, Aurora, CO 80045; email: jasgchandler@comcast.net.

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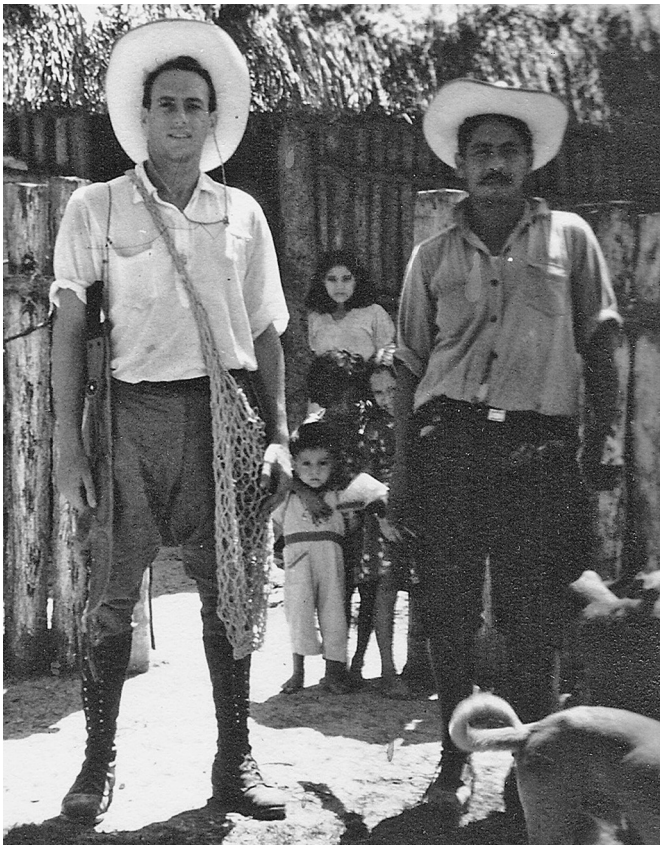

Figure 1. On a summer break ready to cut Central American cane and sampling subtropical living.

the war. Ben picked the Navy based on his summer seamanship and began a whirlwind, event-laden transition. His Massachusetts General Hospital internship and time for deciding to be a surgeon were cut from 12 to 9 months. Six days later, in April 1944, he was on a ship sailing to England and, shortly after his arrival, met Mary Harding on a blind date. Whatever dalliance they might have enjoyed was brief because Lt Jg Eiseman landed on a Normandy beach on June 7, equipped with just bandages and sulfa powder. "We had no surgical capability or training and were essentially morale officers, there to comfort and bandage the wounded to get them back on the landing crafts to England" (SVS, unpublished Eiseman interview).

When the Normandy beaches were secured, Eiseman's amphibious unit received orders to ride their shallow-draft, flat-bottomed landing crafts across the Atlantic, through the Panama Canal and across the Pacific to participate in the invasion of "Bloody" Peleliu in the Palau islands, which had the highest casualty rate of any amphibious invasion in the entire Pacific War. MacArthur believed driving the enemy out of Peleliu was strategically essential to his retaking the Philippines, which was the next stop for Ben's amphibious unit before going to Okinawa.

Japan's surrender on September 2, 1945, brought visions of a seaworthy troopship cruising through the "Big Ditch," with a well-stocked galley, but orders arrived to come back to England in their remaining landing crafts. En route orders to detour to Cairo to support quelling a local uprising furthered uncertainty for the voyagers and those awaiting their return. Mary's persistence had persuaded her parents that it would be safe and reasonably sane to marry this adventure-loving American doctor, who had yet to begin training for his chosen specialty. Ben enhanced his immediate worth by bartering bottles of Navy postexchange whiskey for precious fresh eggs and butter so that his bride could have a proper Fortnum & Mason wedding cake. Reverend Walter Harding heartily endorsed his daughter's decision by officiating at their wedding (Fig. 2).

Ben sailed for home and was discharged from active duty to begin his surgical residency at Washington University's Barnes Hospital in January to train under Evarts Graham, whose children had been his St. Louis schoolmates. He presented his first clinical study as a second-year resident at the 1947 meeting of the American Surgical Association, describing the awesome complications and potential preventability of peritoneal talc granulomas.[1] "Hank Bahnson and I exchanged residencies for a year. I enjoyed my time at Hopkins, but when I returned to St. Louis, Dr. Graham told me that he was very sad that Dr. Bahnson could not stay on" (SVS, unpublished Eiseman interview).

Dr. Graham had really wanted both of them. Ben completed his residency in 1950 and stayed on as a junior faculty member through 1952. He also served as the assistant dean in charge of Washington University's exchange program with the Siriraj and Chulalongkorn Medical Schools in Bangkok, Thailand, which became the first sites of his many international visiting

Figure 2. December 22, 1945, in Sunningdale, England.

Figure 3. Rear Admiral, MC, USNR and off to the next Vietnam I Corps medical unit in May 1966.

professorships. This relationship spawned a study of intravenous green coconut water in 157 patients "to evaluate its clinical role… in parts of the world where pyrogen-free solutions cannot be obtained."[2] Coconut water is naturally sterile. The median infusion was 500 mL, which caused only mild febrile reactions in 11 patients (7%), but its 40-mEq/L potassium concentration and acidity gave it diuretic properties, making it dangerous for patients in renal failure and unsuitable for rehydration.

Ben had retained his commission in the Naval Reserve, recognizing that the Navy, in addition to senior faculty at both Barnes and Hopkins, had invested heavily in his career. He now perceived his responsibilities to be aligned with the second portion of the Parable of the Faithful Servant: "…and to whom men have committed much, of him they will ask the more" (Luke 12:48). His *more* was to be a lifelong champion of military medicine, coupled with an impulse to innovate and accept Evart Graham's challenge to become a teacher of future professors of surgery. He joined the Society of Medical Consultants to the Armed Forces (SMCAF), which Elliott Cutler, Bernard Pisani, and Michael DeBakey had founded in 1946, returned to active duty in the Korean Conflict as an on-scene advisor to the surgeon general, and then reprised this role as a rear admiral in the Vietnam and Gulf Wars (Fig. 3).[3]

"In May 1966, I was slumped on the floor against the wall in Chou Lai with the operating room light turned towards me, looking at x-rays of the seventh patient I was going to operate on after 18 hours without a break. Everybody was moving slowly and exhausted, when Ben burst into the room asking, 'Who's Chandler?' I saw the two stars and scrambled to my feet. Before I could introduce myself he took the wet mop from the corpsman, shoved it into my hand and said, 'If you start mopping, then everybody else will get going again.' We did the next two cases together and then stretched out on cots in the sun for some heavy private tutoring." —Jim Chandler

In 1972, Congress established a Uniformed Services University for the Health Sciences to provide a continuing supply of active duty physicians committed to serving their nation. The Charter Class matriculated in 1976, 1 year before the Department of Surgery became the last major medical department to be filled. Norman Rich recruited a group of distinguished senior academic surgeons to his faculty, whom Dr. Eiseman knew would not be deterred by Norm's inability to offer them hospital operating privileges.

"We all know Ben's love of the Navy… When he nominated me for membership in the Society for Vascular Surgery in 1970, both General Carl Hughes and General Tom Whelan pulled me aside to tell me that they thought I was too young and that I should call Ben and tell him what they thought… Ben's response was, 'You tell those two generals that an admiral is in charge and all will go as planned'… and it did." –Norman Rich

SMCAF surgeons became the nidus of a still-growing Uniformed Services University USU Surgical Associates who continue to support the department. Ben became its 1996–1997 president, and W. Gerald Rainer and Ben's son-in-law, Robert G. Scribner, commemorated his election by founding the Uniformed Services University for the Health Sciences Ben Eiseman Professorship in Surgery.

In 1953, Ben accepted Henry Swan's invitation to become chief of the Denver Veteran's Administration Hospital's surgical service. He and his first resident recruit, W. Gerald "Jerry" Rainer, used a right supraclavicular aortic-arch, direct-stick aortography to visualize aortic lesions "unapproachable by the usual lumbar aortographic techniques."[4] One patient not included in their report had an unsuspected aortic coarctation, causing the usual contrast dose to light up his coronary arteries that frightened both operators, but the only dire consequence was a

unique-for-Eiseman missed opportunity. On October 30, 1958, Cleveland Clinic's F. Mason Sones Jr's femoral artery catheter accidentally slipped into a right coronary orifice, leading to his development of cine-coronary angiography that became the disruptive platform for an entirely new specialty.[5]

"In Dr. Eiseman's VA days, residents viewed 'The Boss' as tough, aggressive, demanding, impatient, and sometimes frighteningly critical and caustic. The wife of one of us had a darkly pigmented lesion removed from her back. The VA pathologists were uncertain of the diagnosis, and we all worried that it was a melanoma. Dr. Eiseman was scheduled to go to St. Louis and took her slides to Lauren Ackerman, who determined that it was a benign mole. Successive editions of Ackerman and Del Regato's *Cancer: Diagnosis, Treatment and Prognosis* had been the surgical pathologist's 'Bible' since 1947. The boss surprised us with this authoritative happy news. We were aghast and humbled by our inability to discern the affection and respect behind his goading us to be better than we ever thought we could be." –Larry Norton

Ben used his extensive English contacts to set up a yearly junior resident-registrar exchange program with St. Bartholomew's Hospital beginning in 1959, whereby each selected trainee would spend a full year at the other's institution. This continued for 12 years, following Ben to Lexington in 1961. It was highly successful both surgically and socially. Bart's Pip Knight, John Wickham, John Sales, and others came to Denver and then Lexington to work with Dr. Eiseman toward achieving their "Mastership," and the "Yanks" lost some rough edges, while acquiring a broader perspective of the art and science that made good surgeons great.

Ben jumped at the opportunity to be the University of Kentucky's first full-time chief of surgery with its freedom to set rather than follow precedents. This was a remarkably productive time, beginning with his recruiting seven young surgeons, destined to become department chairs or service chiefs (Fig. 4). He and his colleagues evaluated extracorporeal lungs and livers as a means of oxygenation or metabolic cleansing to allow damaged native organs time to recover. Fresh cadaver organs were difficult to obtain and were often themselves not fully functional. Canine organs did not tolerate perfusion with human blood. Porcine organs were more tolerant and functioned as oxygenators or metabolic cleansers. Professor Eiseman was invited by the Royal College of Surgeons of England to give their 1965 Moynihan Lecture on his use of isolated perfused livers to rescue patients from profound hepatic failure.[6] He reported some remarkable short-term successes, typically limited by the native liver's failure to become fully functional.

Story Musgrave was already flirting with the National Aeronautics and Space Administration when he applied for an internship in Kentucky. He had enlisted in the Marine Corps in 1953, was an accomplished pilot, parachutist, and about to graduate from Columbia University's College of Physicians and Surgeons. Ben Eiseman recognized a true soulmate and excused Story from weekend duty so that he could fly up from Houston in his T-38 jet on Sundays and fly back Friday evenings.

Ben's adventuresome nature also led to his being at the John Slater Biologic Institute in Naples, Florida, to devocalize two exceptionally noisy sea lions. These diving mammals can swim without breathing for 5 minutes and have oral-respiratory intersections shielded by intersecting muscular drapes to seal access to the trachea even as the animal is swimming under water with its mouth wide open. Exposing the vocal cords was difficult but paled in comparison to the "6–8 handlers needed to restrain the animal to obtain access to a flipper vein."[7]

By 1967, Ben had done what he had intended to do in Lexington and yearned to be nearer Colorado's "fourteeners." William Waddell had exactly the right job for him. Denver General Hospital (DGH) had been essential to the university's

Figure 4. 1962 University of Kentucky surgical faculty and residents, front row from left to right: Lester Bryant, Benjamin Rush, BE, Frank Spencer; missing: Rene Menguy.

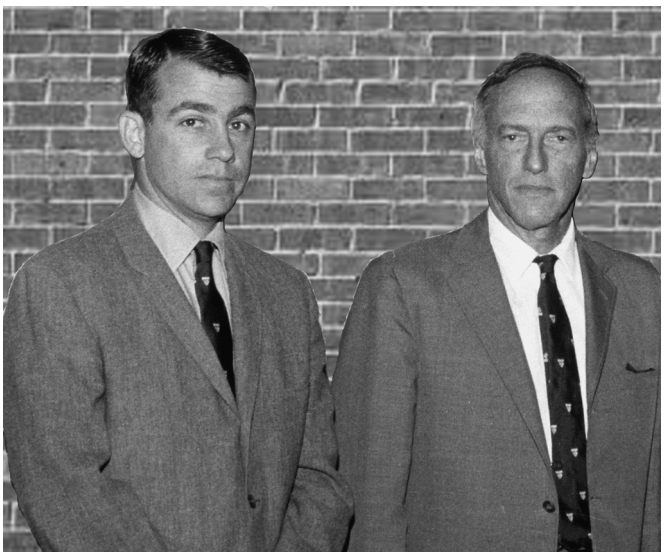

Figure 5. 1967 July/August DGH full-time surgical staff.

teaching and research programs for 14 years until 1961, when the city administration and community volunteer physicians thought they could offer better quality care with less expense by curtailing teaching activities.[8] They were wrong on both counts, and a new city-university contract had just been completed. Waddell knew that Eiseman would be a no-nonsense chief of surgery and a prominent force in upgrading the hospital. Sloppiness had become routine; equipment had been lost, along with the academic atmosphere; and its residents were of variable caliber and pretty much on their own. Fortunately, Eiseman had a comrade in arms on his way (Fig. 5).

"I finished my residency at Duke on June 30, 1967, and made rounds with BE on July 5th, since as he put it, the 4th was a holiday. BE and myself were the full-time surgical staff. Each morning at 6:30 sharp, we made rounds with the residents in the circular ICU of the old DGH (Nicholson building). Rounds always ended with deciding which patient should be hooked up to the only available monitor, an old American Optical monitor-defibrillator, and then going to breakfast before heading for the OR. BE included me in the administrative meetings that focused on reorganizing the hospital to restore its vital role in the University surgical training program. It was lots of fun and great experience for everyone." –Marvin Pomerantz

Ben gathered his troops, instituted his legendary weekly M&M conferences and fired a few people. Larry Norton joined him after 5 years of being a missionary doctor in India. Glen Kelly came from the university to join the team, and Henry Swan began operating at DGH. Scientist-astronaut Story Musgrave would fly up on weekends to work first as a surgical resident and later on as a visiting attending. There was plenty of clinical work, but Ben was determined to have an equally vigorous research program.[9] He restarted his extracorporeal organ perfusion studies, adding the spleen and putting more emphasis on the lung.[10,11]

"It was a beautiful spring Friday, when BE put out the 'call' to his residents and laboratory fellows: 'We're climbing Longs Peak on Sunday.' This was not a 'walk in the park,' but a tough climb on a 14,000 ft. mountain. Unbeknownst to the 'Boss,' Larry Norton, my 14-year-old son Mike, and I left Saturday with a collapsible Kool-Aid stand and cups. We summited after a night near the boulder field, set up and waited for BE's customary harmonica rendition of the Marine Corps Hymn, accompanied by the clanking of an ice axe on rocks. The 'Boss' appeared, followed by the hardier of his residents. The music went on with laughter, good weather and Kool-Aid. We spent the rest of the day rounding up stragglers, who were all over the mountain. With BE's direction, all made it down safely before dark." –Jack Gallagher

Eiseman's laboratory had already been interested in bubble and membrane oxygenators when his friend, Wilbert Gore, asked Ben to find medical applications for his expanded polytetrafluoroethylene semiporous material, now trademarked as GORE-TEX.[12] They also tested it as arterial and venous conduits in dogs and pigs and were particularly impressed with its continued patency as a replacement for porcine portal vein segments.[13] This led to its use in a pancreas cancer patient, whose portal vein graft was shown to be patent at 17 months and who was known to survive for at least 32 months.[14]

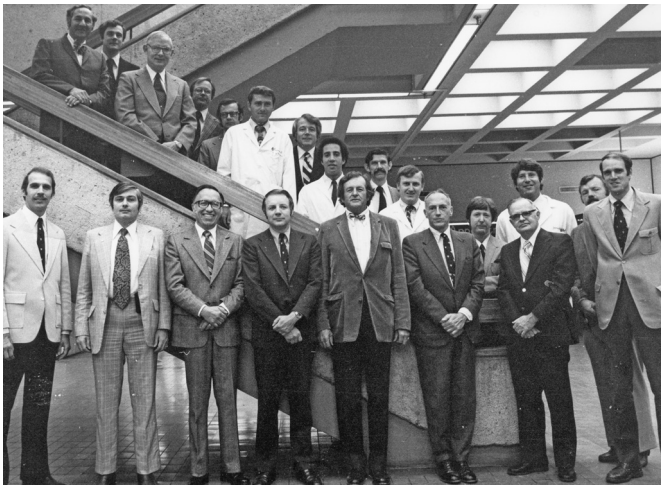

Figure 6. 1974 DGH Surgical Department, front row left to right: Gary Van der Ark, Carl Stecher, Bill Aragon, Larry Norton, Henry Swan, BE, George Moore, Glen Kelly.

In 1973, Ben Eiseman's enthusiasm and open-minded management attracted George E. Moore, who had been the director of Buffalo's Roswell Park Cancer Institute to join DGH's full-time faculty. Moore's arrival stimulated an abrupt uptick in medical oncologist referrals and included research staff (Fig. 6), a complete tissue culture laboratory, and external funding to study chemotherapeutic and immune therapeutic strategies against a variety of human tumor cell lines.[8]

"Besides climbing all of Colorado's 54 'fourteeners,' Ben sought out the highest available mountain wherever he was invited to be visiting professor. This took him and Mary to the base camps of Everest and K2 and the 19,340 ft. (5895 m) summit of Mount Kilimanjaro. He also often climbed with Secretary of Defense and later, World Bank President, Robert McNamara. They had planned to do a 10-mile hike in Crete's 5,000 ft. (1524 m) deep Samaria Gorge in 2004, but both were over 80, and the outfitter insisted they bring along a younger 'nanny.' I barely qualified but was delighted to get an eavesdropper's lesson in international politics, as trekking time was not to be wasted on idle chatter. But after the lunch break, Ben always had to take a ten minute nap whether beside the trail, or sleeping on a stone wall in the rain, his hat pulled down to cover his eyes." –Bruce Paton

Ben joined McNamara in founding the 10th Mountain Division Hut Association Trail system in Colorado, a system that now consists of 18 huts, each a day's skiing distance from its neighbor. The northernmost hut near Vail is the "Eiseman Hut," a permanent tribute to an inveterate mountaineer and lover of Colorado's mountains (Fig. 7). He also managed to find time to slip over to Fitzsimons Army Hospital where he encouraged clinical research.[15] His major contributions to trauma care and military medicine, however, were to emphasize the serial nature of multiple-organ failure and urging the military to embrace damage-control surgery.[16,17]

Figure 7. January 1997 opening day at the Eiseman Hut. Ben's hand is on coconspirator Robert MacNamara's right shoulder, which is identifiable by the shape of its owner's nose and substantiated by inserting his full likeness in the rafters.

Ben ceded the chief-of-surgery title at what is now Denver Health Medical Center to Ernest E. Moore in 1977, moving to head Rose Hospital's surgical service, knowing that Gene would perpetuate and build on his best ideas to inculcate another whole generation with their shared work ethic.[18] Ben's new position was not going to be another fix-it job. Gil Hermann, who came from the Massachusetts General Hospital with Waddell, had fine-tuned Rose's surgical education program, and the rotation there was highly regarded by university residents and students as a glimpse of real-world surgery.

"In 1952, Ben offered to arrange for me to spend several months on a renowned London thoracic surgeon's firm at the end of my third medical school year at Washington University. I was unable to do so but flattered and touched by his interest. Ten years later, shortly after I had arrived to be an attending on Tom Starzl's transplant team, my wife and I met Ben at a party at the Waddells' home. Without a great deal of social amenities, he wanted to know exactly what my research plans were and how they would help to answer specific organ transplantation dilemmas. This abrupt re-initiation into his direct approach was clearly intimidating. Ben was a complex human being, a driver of himself as well as others, acerbic at times but always caring, even in situations where empathy was momentarily implausible. His truly warm humanity and caring touched me greatly when he and Mary had a retirement party for me at their home." –Gil Hermann

Ben retired from Rose in 1988 and theoretically from both the VA and university, becoming a distinguished physician of the Department of Veterans Affairs Medical Centers and professor emeritus of medicine and surgery at the University of Colorado. This was no sinecure: he became a book reviewer for the *New England Journal of Medicine* and *JAMA*, was senior editor of fourth and fifth editions of his *Surgical Decision Making* book, and coedited *Prognosis and Outcome Expectancy of Surgical Diseases,* with Daniel McKellar and Richard Reiling.

"Dr. Eiseman had asked me in Kentucky why I would not be with him in the coming year and I said 'Sir, 'cause I'm going into space.' His immediate response was 'How can I help?' I wanted to stay in touch with medicine during my astronaut career. I did that as a part time 'generalist' at DGH for 22 years, working with the 'knife and gun club,' delivering babies and pulling abscessed teeth. Dr. Eiseman's enthusiasm and spirit could get anything he wanted done in the hospital, on a battlefield, or even in NASA's Mission Control Center. He showed up to mentor and critique my 1993 role as the lead space walker in our operation to salvage the Hubble Space Telescope. The Mission Control folks could tell that he was one of those 'failure is not an option' persons and passed his suggestions up to me. That was our last case together; we got the job done." –Story Musgrave

Ben was regularly in his sixth floor VA office near the Eiseman Surgical Intensive Care Unit from 6:00 AM till noon, making teaching rounds and inspiring students. That is, except for some Fridays, when he left early for his ranch in the Sangre de Cristo Mountains, 7 miles from electricity (Fig. 8). Reading from his Kindle and using its light to get around at night inspired him to venture into electronic books with a guide for geriatric patients, *Navigating Health Care for the Oldest Old*, written with Tom Robinson and Larry Norton. Ben chopped wood to heat the ranch well into his 90s, and as he directed, his eternal spirit now gazes down upon this special site since November 19, 2012, protecting it and all who go there with good intentions.

Figure 8. Mary and Ben Eiseman at their ranch in December 2010.

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