

Muzzles and Bullets Rabies in Nevada

By Reuel Jake Meason, School of Medicine Medical Student

“If there’s rabies out there they’ll show up. If they’re sick, they won’t be afraid of a man or his gun.”

“So what am I supposed to do?” Ramon asked.

“Shoot and shoot and shoot...” Cade replied.

Time of the Rabies, by Robert Laxalt

In the early 1900s an old-world malady was introduced to the western United States. The disease was rabies, an ancient misery that was making fresh tracks on a landscape that had never known its flavor of cruelty. The disease made its way from California in 1909 and slowly worked into the surrounding states where it established itself. This epidemic in Nevada was sufficiently terrible to prompt famed Basque-Nevadan author Robert Laxalt to pen the novella, *Time of Rabies*, which fictionalizes the account of a family of Basque ranchers as they cope with the losses and the dangers of living and working in the heart of the epidemic.

Outside the pages of fiction the losses to the state, which depended largely on commercial livestock, were significant. Over the course of a twenty-month period conservative estimates placed the loss of livestock at over \$750,000 (which adjusted for inflation is just over \$17 million today). The severity of this disease, and the subsequent catastrophic industrial losses, prompted an organized effort that could be argued as one of the greatest public health successes in Nevada’s history.

Rabies or hydrophobia is a particularly sinister and well-known condition, the course of which has been popularized in both literature and film. The disease is spread by the bite of infected animals as the virus is transmitted through the saliva. The bullet shaped zoonotic virus then invades the peripheral nerves and makes its way to the brain where it settles into the hippocampus and causes anxiety, paranoia, agitation, and hallucinations. The later stages progress to the classic hydrophobia, where the patient is unable to drink despite crippling thirst and from there into delirium, coma, and inevitably death.

The fear of impending death, and grueling symptoms that precede it, prompted many victims to commit suicide. The hysteria that precipitated this practice was quite prevalent even into the late 19th century when Louis Pasteur first developed a treatment in France. The initial product, while crude, found itself to be quite effective and the first use of which was well documented. In 1885 Pasteur performed the first successful post-exposure prophylaxis on a young boy named Joseph Meister, following an attack by a rabid dog. The resulting method, though initially frowned upon by mainstream science (many contested that it was over applied and actually caused rabies in originally uninfected persons, the so-called “*rage du laboratoire*”), soon became the standard of care for rabies and was known appropriately as the Pasteur treatment.

Pasteur Institutes were set up throughout Europe and North America to prepare and administer the life saving vaccine. The vaccine was made by infecting rabbits to produce the virus. Once they were noted to exhibit rabid symptoms and perish in a uniform time frame, the spinal cords were removed and dried for varying periods with potassium hydroxide. The drying time was the key to the dose to produce immunity. The cords were ground up and placed in a solution of broth or saline for administration. Patients received injections from cords dried for 14 days and injected sequentially until a “two-day cord” that was dried for two days was used (immunity was built by giving serial vaccines with an increasing viral load). The procedure was reputed to be only slightly less terrible than the disease. It included 21-25 subcutaneous abdominal injections over a period of 18-22 days, with three doses given on the first day. Despite the crude nature of the treatment, it was highly effective. As of yet, there is no known case in Nevada where the prescribed treatment failed. One doctor noted that with the addition of proper dog laws “rabies is one of the most preventable of diseases.”

In Nevada, public officials had been able to track the progress of the disease through the neighboring states but could not prevent its inevitable entrance beyond its own borders. It started in California, appearing as early as 1909 then making its way into Oregon by way of a sheepdog in 1912. The sheepdog is thought to have spread the disease into the wild there through a fight with a coyote, which then propagated the epidemic. The first known case of rabies in Nevada occurred in April 1915, through a band of coyotes coming into Humboldt County from southern Oregon. Soon afterward the disease passed into Washoe County

from eastern California, and into Elko County from Idaho. Radiating out from three different routes the full force of the epidemic was fast approaching.

Nevada health officials, lead by W. B. Mack at the Nevada State Hygienic Laboratory recognized that entrance of the disease was only a matter of time and thus took preemptive action for public health measures.¹ They obtained a sample of virus from Dr. W. A Sawyer at Berkeley to begin preparations of the Pasteur treatment previously described. In addition to the medical prevention measures, the state formed the Nevada Rabies Commission. This was the first organization of its kind, an entity dedicated entirely to the control of rabies.

In September 1915 the executive office of Nevada issued a public service announcement printed in newspapers statewide describing the threat, modes of spread, and the methods to be used for containment. At this time the federal government had become involved. The U.S. Biological Survey and the state entered into a cooperative agreement to hire men “to hunt, trap, and poison” animals, namely coyotes, with a propensity to be vector for the infection. In addition to wild animal control there were strictly enforced police regulations requiring the “muzzling or destruction of all dogs.” It was noted that “one of the most serious obstacles” in the control of rabies was the degree of “affection many people exhibit towards dogs”. The rule was stern and enforced. Dogs found without a muzzle, even while on a leash (and in one case while in a fenced yard) were shot on sight. In terms of the wild hunt, death tolls were significant. From October 1915 to December 1916 “over 8,800 coyotes, 1,300 badgers, 1,200 bobcats, and 100 mountain lions” were shot or trapped. Two hundred and fifty thousand poison traps were also set that may have killed an additional 25,000 coyotes. The degree of success on the campaign was such that many of the men who worked as fur traders began selectively leaving females alive so as to sustain a future livelihood.

Despite the aggressive animal control the cost in livestock losses remained tremendous (though likely mild compared to what could have been). The true success of the public health measures undertaken by the state can be appreciated by examination of human rabies cases, or lack thereof. Since the introduction of rabies to Nevada in 1915 until the epidemic tapered off around 1920 there were a total of 186 persons administered the Pasteur treatment by the Nevada Hygienic Laboratory. Although no exact figures exist, it is estimated that greater than 200 other persons received some form of anti-rabies treatment by private physicians in the state. Not a single person who received the vaccinations was known to have suffered the full course of the disease. In fact, according to the modern Nevada Public Health Department there has never been a verified human rabies death in the state. There are, however, two notable exceptions as described by Edward Record, D.V.M. in 1932: “...so far as known, at most only two persons have died of rabies as a result of exposure to infection in Nevada. Neither of these patients received preventive treatment. One died in an isolated location during a storm-bound period without medical attention, but the history and the symptoms reported leave little doubt as to the diagnosis. The other case was a man bitten by a dog, which afterward proved to be rabid, who left Nevada and was lost track of. This man was

¹**Veterinarian Winfred B. Mack was the first director of the Nevada State Hygienic Laboratory and served from 1910 to 1916.**

reported to have died of rabies later.”

The first Nevada rabies epidemic posed a very real threat to the health and safety of the population. With quick action, the concentrated efforts of public officials resulted in what could be considered a near best case scenario outcome.

Rabies still exists in Nevada, but is rare. The most common culprits are bats, the occasional ground squirrel, and even more rarely, dogs. The State Hygienic Laboratory is now known as the Nevada State Public Health Laboratory at the School of Medicine. As previously mentioned, there has never been a single “documented” human rabies death in Nevada, a statistic not shared by the surrounding states. Whether or not the continued success of rabies control is attributable to the original epidemic and the implemented control measures is uncertain. What is certain is that Nevada set the bar for rabies control at that time. From its formation of the Nevada Rabies Commission to the effective administration of prophylaxis, it was truly a public health success.

The Changing Face of Nevada’s Medical School

The Editors

The world is changing-get onboard. University of Nevada, Reno School of Medicine Editor of News, & Publications Anne McMillin: “The Nevada System of Higher Education Board of Regents on June 10, 2016, declared the University of Nevada School of Medicine will be renamed. We are proud to announce that on July 1, 2016 our name formally changed to the University of Nevada, Reno School of Medicine, as we more closely align with our parent university. A rebranding campaign, with a

new logo, will roll out in the coming months.”

This change reflects the creation of a new school of medicine in Las Vegas. The editors of *Greasewood Tablettes* will use the University of Nevada, Reno School of Medicine in future references to the first school of medicine in Nevada. We further note that the name and presence of a medical school in northern Nevada was controversial on “Day One” in 1969 when the 2-year School of Medical Sciences was created in Reno on a vote of six to two. Two regents said that Nevada could not afford a medical school. Since then there have had several name changes, which reflect Nevada’s political climate and evolution of its medical education.

The name was changed from University of Nevada School of Health Sciences to University of Nevada, Reno School of Medicine in the late 1970s when the school moved to a 4-year curriculum with the granting of the MD degree in 1980. Thus, when Dean Bob Daugherty arrived in 1981 it was the University of Nevada, Reno School of Medicine. In 1982 Dr. Tom Cinque became the first Associate Dean for Las Vegas and the School of Medicine created a Dean’s Office in Las Vegas. Shortly thereafter, Dr. Daugherty requested the Board of Regents to remove Reno from the School’s name and change the name to University of Nevada School of Medicine to reflect the School’s statewide mission including Las Vegas. A brief anecdote from former Dean Bob Daugherty: “The UNR School of Medicine” sign over the Las Vegas Dean’s office disappeared weekly. After we changed the sign to the University of Nevada School of Medicine in the early 1980s, the sign never disappeared again!”

H. Malin Prupas Memorial Student Scholarship

Please join us in honoring Dr. Malin Prupas, who died 23 February 2016 after 35 years of medical practice as a rheumatologist in Nevada. The H. Malin Prupas Medical Student Scholarship will be awarded annually to a University of Nevada, Reno School of Medicine student from Nevada.

Dr. Prupas was a charter member of the first class to enter the University of Nevada School of Health Science. We are honoring his passion for his home state of Nevada and his profession by establishing a scholarship in his name.

Our goal is to create a \$25,000 endowment, which will enable the scholarship to be an annual award in perpetuity. The Prupas family, Dr. Bob Daugherty, Dr. Anton Sohn, and the Nevada History of Medicine Foundation have each contributed \$1,000 and hope that you, our readers, will join us in honoring and creating a legacy for Dr. Prupas. The Prupas family will match the gifts to reach the \$25,000 goal.

Please contact School of Medicine Director of Development Seema Donahoe at sdonahoe@unr.edu or 775-682-7304 for information on contributing to the scholarship. Contributions can also be made payable to UNR Foundation and mailed to University of Nevada, Reno Morrill Hall/162, Reno, NV 89557-0162. Please note “In memory of H. M. Prupas.”

Museum Day 2016



Intrepid pathologists Phillip Usera and Anton Sohn taught young students how to use a stethoscope. Wolfie has an 1856 wood stethoscope from Austin (NV) in his left hand and his medical license issued by Usera/Sohn in his right.

GREASEWOOD TABLETTES © is a quarterly publication of the Department of Pathology, Great Basin History of Medicine Division, University of Nevada, Reno School of Medicine. Doctors Anton P. Sohn, Robert Daugherty and Phil Usera are co-editors, Lynda D. McLellan is our production manager, Dr. Marcus Erling is publisher, Kristin Sohn Fermoile is copy editor, and Katelyn Burgoyne is formatting editor. The newsletter is printed by the Department of Pathology. The cost of publication is paid for by a grant from the Pathology Department, School of Medicine. The editor solicits any items of interest for publication. Suggestions, corrections and comments are welcome. Please feel free to email us at antonps@gbis.com or write us at Department of Pathology/0350, University of Nevada, Reno School of Medicine, Reno, NV, 89557. The name GREASEWOOD TABLETTES © is derived from the greasewood plant or creosote bush, a plant that was used by Native Nevadans for medicinal purposes. It is still the subject of pharmacological research today.