THE INTRODUCTION OF PEYOTE INTO PHARMACEUTICAL AND PHARMACOLOGICAL FRAMEWORKS

Mary Magnuson, Hannah Swan, and Lucas Richert

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In a 1968 issue of the *Journal of the History of Medicine and Allied Sciences*, George Bender describes the process of securing plant materials suspected to have medicinal, psychoactive, or pharmacologically compelling properties as "rough and ready research."[1] In the mid- to late nineteenth century, there was a push to find new plants that could be made into medicines, but transportation and communication infrastructure was not half as robust as it is now. Collecting specimens that might serve as the next cancer drug, painkiller, or miracle pharmaceutical often entailed forays into remote areas or developing relationships with people who lived in or ventured to these areas. Scientists studying plants with potentially medicinal properties often had to have knowledge of botany and

1. George A. Bender, "Rough and Ready Research—1887 Style," *Journal of the History of Medicine and Allied Sciences* 23 (1968): 159–66.

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pharmacology, as well as outdoors skills and physical and mental fortitude. Bender paints early research on the plant later called peyote as an example of this "rugged" research, and he even suggests that compared with those early projects, pharmaceutical research now seems a little "quaint."

Since Bender's time, a Redundant body of scholarship has emerged that examines the rugged pioneer-scholar who entered communities around the world to seek out new knowledge and medications—often taking plants already known to Indigenous communities for decades or centuries prior, known now as "bioprospecting." The historians and anthropologists who study this phenomenon today offer critiques of colonial structures that facilitated and benefited from the work of these early scientists. Research has examined the rationale and logics that helped develop the "rugged" bioprospector and biocolonialism more generally, which in many cases had detrimental consequences to the community the scientist entered—whether it was in Latin or South America, Africa, Asia, or elsewhere. The volume 63, number 2 special issue of *History of Pharmacy and Pharmaceuticals* called "Colonial Histories of Plant-Based Pharmaceuticals" featured scholarship of this variety, which offered thoughtful critiques of several types of pharmaceuticals.[2]

In this article, we dive into a collection of materials held in the American Institute of the History of Pharmacy's archives about the peyote plant's introduction into Western pharmaceutical frameworks and offer an overview of the complex relationships and myriad correspondences that led to the first research on and commercial use of the plant. This is not the first work to tell this story, as others, including Mike Jay's *Mescaline* (2019)[3] and Alexander Dawson's *The Peyote Effect* (2018)[4] have told parts of this story. This article seeks to provide an overview, supplemented with some of the works in the Bender collection.

The materials detailing the interactions between the scientists, pharmaceutical companies, and outside dealers in psychoactive plants all come from the George Bender Collection at the American Institute of the History of Pharmacy. Bender was a notable pharmaceutical historian and journalist from Wisconsin. He served as American Institute of the History of Pharmacy (AIHP) president and editor of the journal *Pharmacy in History*, now known as *History*

2. For more on this, see "Colonial Histories of Plant-Based Pharmaceuticals," *History of Pharmacy and Pharmaceuticals* 63, no. 2 (2021).
3. Mike Jay, *Mescaline: A Global History of the First Psychedelic* (New Haven, CT: Yale University Press, 2019). See also review of this book in this issue.
4. Alexander S. Dawson, *The Peyote Effect: From the Inquisition to the War on Drugs* (Berkeley: University of California Press, 2018).

Figure 1. Peyote is a spineless, blue-green cactus native to northern Mexico and the Southern United States, used traditionally by Indigenous peoples for ceremonial purposes. Due to the alkaloid mescaline it contains, it has a hallucinogenic effect when consumed. It's scientifically classified as *Lophophora williamsii*. Shown are nine of the dried "buttons." American Institute of the History of Pharmacy, George Bender Collection.

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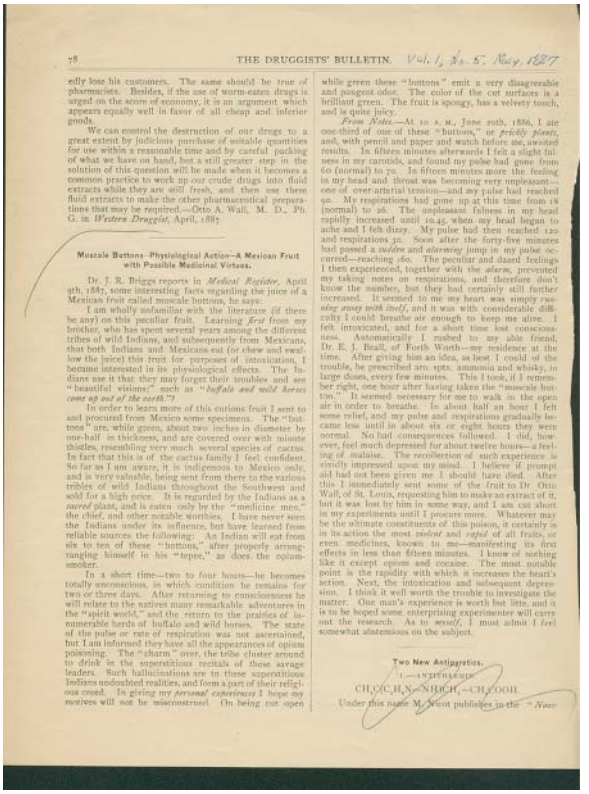
of Pharmacy and Pharmaceuticals. He wrote several well regarded historical articles, including *Great Moments in Pharmacy* and *Great Moments in Medicine*.[5]

This story begins with John Raleigh Briggs (1851–1907), a Texas physician, who is regarded as the first American or European to find peyote and study its effects. He published an account of his own personal experience eating one of the "Muscale buttons" as he called them, in 1887, and his report caught the eye of the Parke-Davis & Company. Parke-Davis, at the time a major player in the pharmacy industry, endeavored to stay at the forefront by searching for and developing new pharmaceuticals. These cacti seemed like a potential avenue, and they worked with Briggs to try to secure a larger quantity of buttons to study.

The Bender collection at the AIHP contains many letters from Briggs to Parke-Davis written over the course of the summer of 1887. The Parke-Davis letters are not held at the AIHP, but Briggs's correspondence contains enough context to paint a clear picture of the company's goals. In the first of these letters, Briggs wrote about samples of these buttons. Parke-Davis had requested he send

5. William Zellmer, "Remarkable Pharmacists," *American Journal of Hospital Pharmacy* 33, no. 10 (1976): 1035.



78 THE DRUGGISTS' BULLETIN. Vol. I, No. 5. May, 1887

edly lose his customers. The same should be true of pharmacists. Besides, if the use of worm-eaten drugs is urged on the score of economy, it is an argument which appears equally well in favor of all cheap and inferior goods.

We can control the destruction of our drugs to a great extent by judicious purchase of suitable quantities for use within a reasonable time and by careful packing of what we have on hand, but a still greater step in the solution of this question will be made when it becomes a common practice to work up our crude drugs into fluid extracts while they are still fresh, and then use these fluid extracts to make the other pharmaceutical preparations that may be required.—Otto A. Wall, M. D., Ph. G. in *Western Druggist*, April, 1887.

Muscale Buttons—Physiological Action—A Mexican Fruit with Possible Medicinal Virtues.

Dr. J. R. Briggs reports in *Medical Register*, April 9th, 1887, some interesting facts regarding the juice of a Mexican fruit called muscale buttons, he says:

I am wholly unfamiliar with the literature (if there be any) on this peculiar fruit. Learning *first* from my brother, who has spent several years among the different tribes of wild Indians, and subsequently from Mexicans, that both Indians and Mexicans eat (or chew and swallow the juice) this fruit for purposes of intoxication, I became interested in its physiological effects. The Indians use it that they may forget their troubles and see "beautiful visions;" such as "*buffalo and wild horses come up out of the earth.*"?

In order to learn more of this curious fruit I sent to and procured from Mexico some specimens. The "buttons" are, while green, about two inches in diameter by one-half in thickness, and are covered over with minute thistles, resembling very much several species of cactus. In fact that this is of the cactus family I feel confident. So far as I am aware, it is indigenous to Mexico only, and is very valuable, being sent from there to the various tribes of wild Indians throughout the Southwest and sold for a high price. It is regarded by the Indians as a *sacred* plant, and is eaten only by the "medicine men," the chief, and other notable worthies. I have never seen the Indians under its influence, but have learned from reliable sources the following: An Indian will eat from six to ten of these "buttons," after properly arranging himself in his "tepee," as does the opium-smoker.

In a short time—two to four hours—he becomes totally unconscious, in which condition he remains for two or three days. After returning to consciousness he will relate to the natives many remarkable adventures in the "spirit world," and the return to the prairies of innumerable herds of buffalo and wild horses. The state of the pulse or rate of respiration was not ascertained, but I am informed they have all the appearances of opium poisoning. The "charm" over, the tribe cluster around to drink in the superstitious recitals of these savage leaders. Such hallucinations are to these superstitious Indians undoubted realities, and form a part of their religious creed. In giving my *personal experiences* I hope my motives will not be misconstrued. On being cut open while green these "buttons" emit a very disagreeable and pungent odor. The color of the cut surfaces is a brilliant green. The fruit is spongy, has a velvety touch, and is quite juicy.

From Notes.—At 10 A. M., June 20th, 1886, I ate one-third of one of these "buttons," or *prickly plants*, and, with pencil and paper and watch before me, awaited results. In fifteen minutes afterwards I felt a slight fullness in my carotids, and found my pulse had gone from 60 (normal) to 70. In fifteen minutes more the feeling in my head and throat was becoming very unpleasant—one of over-arterial tension—and my pulse had reached 90. My respirations had gone up at this time from 18 (normal) to 26. The unpleasant fulness in my head rapidly increased until 10.45, when my head began to ache and I felt dizzy. My pulse had then reached 120 and respirations 30. Soon after the forty-five minutes had passed a *sudden* and *alarming* jump in my pulse occurred—reaching 160. The peculiar and dazed feelings I then experienced, together with the *alarm*, prevented my taking notes on respirations, and therefore don't know the number, but they had certainly still further increased. It seemed to me my heart was simply *racing away with itself*, and it was with considerable difficulty I could breathe air enough to keep me alive. I felt intoxicated, and for a short time lost consciousness. Automatically I rushed to my able friend, Dr. E. J. Beall, of Forth Worth—my residence at the time. After giving him an idea, as best I could of the trouble, he prescribed aro. spts. ammonia and whisky, in large doses, every few minutes. This I took, if I remember right, one hour after having taken the "muscale button." It seemed necessary for me to walk in the open air in order to breathe. In about half an hour I felt some relief, and my pulse and respirations gradually became less until in about six or eight hours they were normal. No bad consequences followed. I did, however, feel much depressed for about twelve hours—a feeling of malaise. The recollection of such experience is vividly impressed upon my mind. I believe if prompt aid had not been given me I should have died. After this I immediately sent some of the fruit to Dr. Otto Wall, of St. Louis, requesting him to make an extract of it, but it was lost by him in some way, and I am cut short in my experiments until I procure more. Whatever may be the ultimate constituents of this poison, it certainly is in its action the most *violent* and *rapid* of all fruits, or even medicines, known to me—manifesting its first effects in less than fifteen minutes. I know of nothing like it except opium and cocaine. The most notable point is the rapidity with which it increases the heart's action. Next, the intoxication and subsequent depression. I think it well worth the trouble to investigate the matter. One man's experience is worth but little, and it is to be hoped some enterprising experimenter will carry out the research. As to *myself*, I must admit I *feel* somewhat abstemious on the subject.

Two New Antipyretics.

1.—ANTIFEBRIN

$CH_3C(CH_3)_2N(OH)CH_2COOH$.

Under this name M. Nicot publishes in the "*News*

Figure 2. A reprint of Briggs's column detailing his experience ingesting the "Muscale buttons," later known as peyote, appeared in *The Druggist's Bulletin* in May 1887. In Briggs's recount of his harrowing experience, he reported dizziness, an elevated pulse, and rapid breathing. This column caught the eye of Parke-Davis Co., a major Detroit-based pharmaceutical company. American Institute of the History of Pharmacy, George Bender Collection.

them as many buttons as he could to run tests on. This request prompted Briggs to return to his original source: a Mexican smuggler who mainly provided the buttons to Indigenous people in Texas. When Briggs struggled to get enough buttons to send to Parke-Davis from the smuggler, he attempted to secure more buttons from a trader. He reported in a June 8, 1887 letter that while he'd had trouble dealing with this trader, he had managed to secure a cigar box's worth of the buttons.

With the limited sample of "Muscale buttons" in hand, Parke-Davis enlisted the help of their botanical consultant, Henry Rusby, a professor of botany and medical material at the College of Pharmacy in New York. From Rusby, a larger network of researchers with samples of the buttons developed.

First, Rusby sent samples to Sereno Watson at Harvard, and the samples were later cataloged and placed into the Gray Herbarium. Watson identified in a July 19, 1887 letter that the plant seemed to belong to the genus *Anhalonium*. A few days later, Rusby and his colleagues started to debate nomenclature; in a July 26 letter, Rusby advocated for the term "Pellote," rather than "Muscale buttons," as "Muscale" could easily be confused with the drink mescal. In the same letter, he expressed uncertainty about the true abundance of the buttons. He said that the

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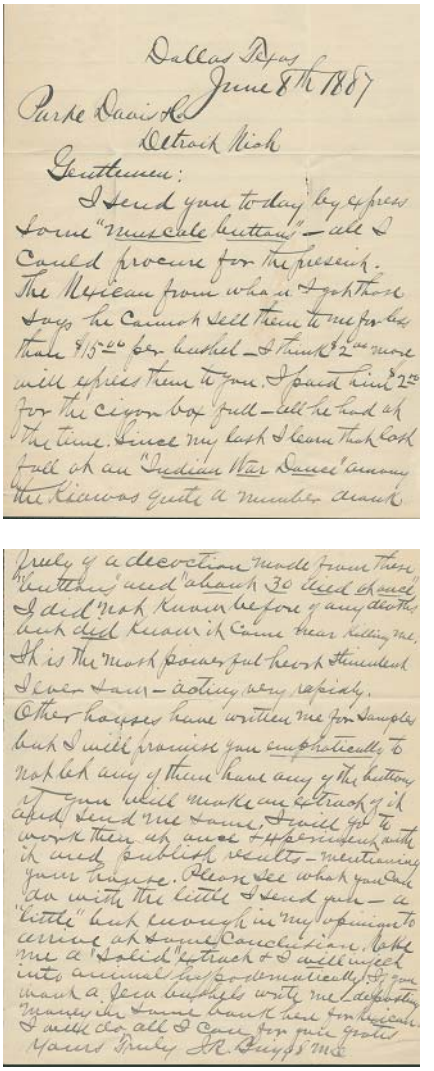

Dallas Texas June 8th 1887

Parke Davis & Co
Detroit Mich

Gentlemen:

I send you today by express some "muscale buttons" — all I could procure for the present. The Mexican from who I got those says he cannot sell them to me for less than $15.00 per hundred — I think $2.00 more will express them to you. I paid him $2.00 for the cigar box full — all he had at the time. Since my last I learn that a full ab an "Indian War Dance" among the Kiowas quite a number drank freely of a decoction made from these "buttons" and about 30 died of same. I did not know before of any death that did result it came near killing me. It is the most powerful heart stimulant I ever saw — acting very rapidly. Other happen have written me for samples but I will promise you emphatically to not let any of them have any of the buttons if you will make an extract of it and send me same I will go to work then at once & experiment with it and publish results — mentioning your name. Please see what you can do with the little I send you — a "little" but enough in my opinion to arrive at some conclusion. Make me a solid extract & I will inject into animal tissue hypodermatically. If you want a few buttons write me & I will send them the same boat I bring mine. I will do all I can for your good.

Yours Truly J.R. Briggs M.D.

Figure 3. Briggs's June 8, 1887 letter to Parke-Davis recounts his experiences attempting to secure more buttons for the pharmaceutical company to study. American Institute of the History of Pharmacy, George Bender Collection.

plant could not be as abundant as the traders in Mexico made it seem, "or it would certainly have been known to science." He expressed concern that there were too many similar cacti species in Mexico, and they may have stumbled on a small variety with special psychoactive properties.

The samples in the Gray Herbarium came back into play several decades later, when a Swedish team led by Bo Holmstedt analyzed the samples in the 1960s and determined that they were from the peyote cactus, *L. williamsii*, and Briggs's "Muscale buttons" were, in fact, peyote.

Meanwhile, at Parke-Davis, scientist Frank Thompson also attempted to determine the properties of the sample, separately from Rusby. Through his analysis, Thompson learned that the plant contained a high amount of alkaloids.

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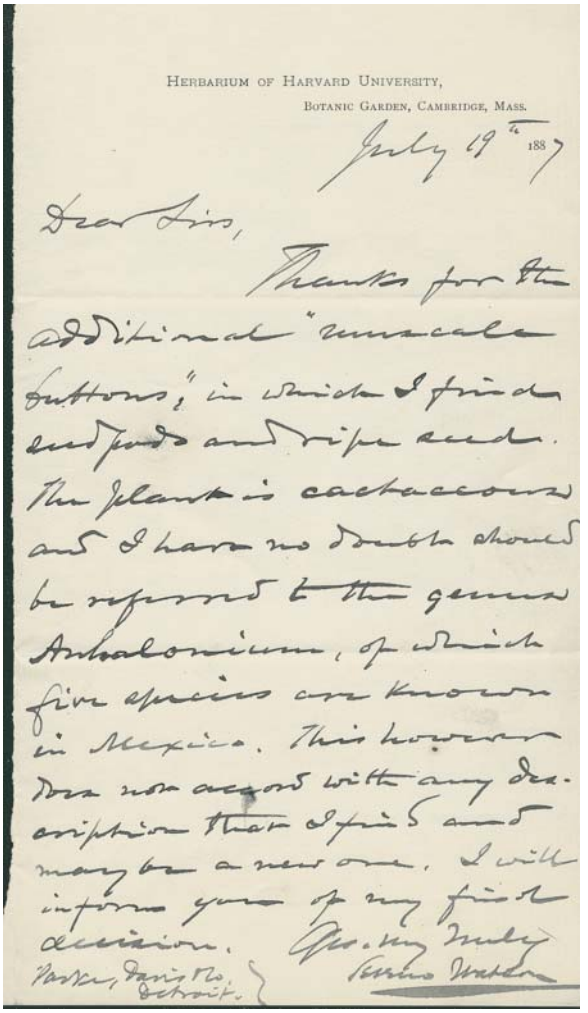

HERBARIUM OF HARVARD UNIVERSITY,
BOTANIC GARDEN, CAMBRIDGE, MASS.

July 19th 1887

Dear Sirs,

Thanks for the additional "mescale buttons," in which I find seed pods and ripe seed. The plant is cactaceous and I have no doubt should be referred to the genus Anhalonium, of which five species are known in Mexico. This however does not accord with any description that I find and may be a new one. I will inform you of my final decision.

Yrs. truly
Sereno Watson

Parke, Davis & Co.
Detroit.

Figure 4. In a July 19, 1887, letter, botanist Serrano Watson from Harvard identifies the buttons as belonging to the genus *Anhalonium*, "of which five species are known in Mexico." American Institute of the History of Pharmacy, George Bender Collection.

Parke-Davis sent samples to Dr. Lewis Lewin, a Berlin-based pharmacologist, as a letter dated July 3, 1887, acknowledges. Lewin studied the alkaloids in the plant and determined that mescaline caused the hallucinogenic properties. He also sent the plant to his colleague P. Henning, a botanist in Berlin.

Henning hypothesized that the plant, while closely resembling *A. williamsii*, seemed to be an entirely new species in the *Anhalonium* genus, and he named it *Anhalonium lewinii*, after his colleague. Lewin reciprocated the gesture and attached Henning to the name, calling it *Anhalonium lewinii, Henning*.

However, over in New York, Rusby wasn't content with Henning's decree that the plant was a separate species from *A. williamsii*, and he continued to debate the plant's taxonomy.

To get more insight into the buttons, Parke-Davis reached out to A. Blanc, a Philadelphia-based botanical expert. In an 1888 letter, Blanc pushed back against

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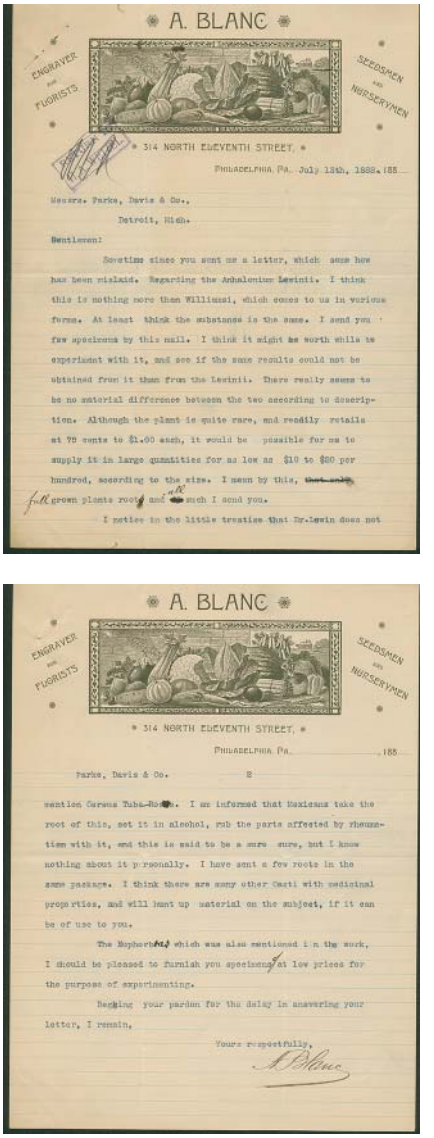

A. BLANC

ENGRAVER AND FLORISTS

SEEDSMEN AND NURSERYMEN

314 NORTH ELEVENTH STREET,

PHILADELPHIA, Pa., July 13th, 1888. 188

Messrs. Parke, Davis & Co.,

Detroit, Mich.

Gentlemen:

Sometime since you sent me a letter, which some how has been mislaid. Regarding the Anhalonium Lewinii. I think this is nothing more than Williamsi, which comes to us in various forms. At least think the substance is the same. I send you a few specimens by this mail. I think it might be worth while to experiment with it, and see if the same results could not be obtained from it than from the Lewinii. There really seems to be no material difference between the two according to description. Although the plant is quite rare, and readily retails at 75 cents to $1.00 each, it would be possible for us to supply it in large quantities for as low as $10 to $20 per hundred, according to the size. I mean by this, ~~that only~~ full grown plants roots and ~~all~~ such I send you.

I notice in the little treatise that Dr. Lewin does not

A. BLANC

ENGRAVER AND FLORISTS

SEEDSMEN AND NURSERYMEN

314 NORTH ELEVENTH STREET,

PHILADELPHIA, Pa., 188

Parke, Davis & Co.

gentlen Cereus Tuba-Ro[illegible]. I am informed that Mexicans take the root of this, set it in alcohol, rub the parts affected by rheumatism with it, and this is said to be a sure cure, but I know nothing about it personally. I have sent a few roots in the same package. I think there are many other Cacti with medicinal properties, and will hunt up material on the subject, if it can be of use to you.

The Euphorbia which was also mentioned in the work, I should be pleased to furnish you specimens at low prices for the purpose of experimenting.

Begging your pardon for the delay in answering your letter, I remain,

Yours respectfully,

A. Blanc

Figure 5. Parke-Davis Co. sent a few buttons to A. Blanc for an opinion about the plant's origin. Blanc wrote back on July 13, 1888, that they believed the plant was *Anhalonium williamsii*, rather than a whole new species as Lewin and Henning claimed. American Institute of the History of Pharmacy, George Bender Collection.

Lewin and Henning's claim that the buttons were a separate species from the *williamsii* and affirmed that they were all the same plant. Blanc even sent Parke-Davis some *williamsii* buttons to compare and said that even though the buttons are expensive, they could supply them in bulk for a cheaper rate. Blanc also mentioned that some Mexicans used the cactus's root to treat rheumatism, affirming its potential for medicinal use.

Meanwhile, as Briggs's issues with the trader worsened, Parke-Davis attempted to find a more reliable supplier. Briggs found himself caught between the trader and Parke-Davis, as the trader demanded more compensation up front and Parke-Davis refused. Paffrath, the trader, reached out to Parke-Davis directly and

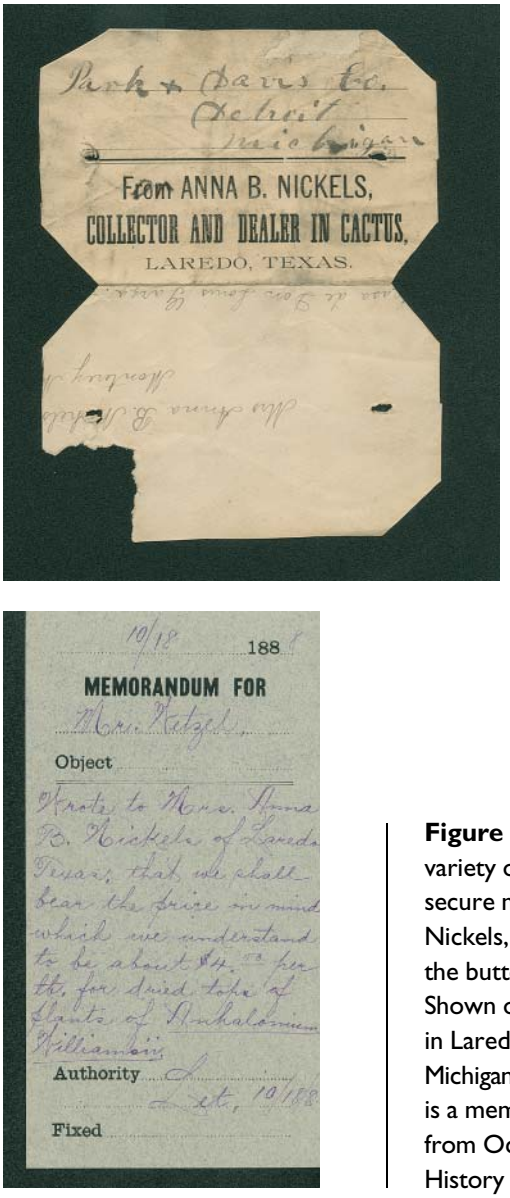

Figure 6. Parke-Davis Co. reached out to a variety of cactus and ornamental plant dealers to secure more buttons to study. One, Anna B. Nickels, wrote to them in May 1888 and provided the buttons for $4 per pound later that year. Shown on the top is an address label from Nickels in Laredo, Texas, to Parke-Davis in Detroit, Michigan, from May 29, 1888. Shown on the bottom is a memo for H. Wetzel, a Parke-Davis employee, from October 18, 1888. American Institute of the History of Pharmacy, George Bender Collection.

attempted to pressure them into buying more buttons by saying that he would start selling them to competing companies. He reached out to the R. V. Pierce company in New York on October 12 and offered to sell them buttons, but they forwarded the message to Parke-Davis. Parke-Davis's letter responding to this action has been lost, but based on Paffrath's defensive and rambling next letter, it must have been incendiary.

Parke-Davis also reached out to Anna Nickels, an ornamental cactus supplier based in Laredo. The Bender collection contains correspondence between Nickels

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and Parke-Davis about securing more buttons, in which Nickels said she already sells the buttons to local Mexican Texans, who use them to make a beverage for treating headaches. The Parke-Davis employee to whom Nickels was writing expressed concern that if people could consume the plant regularly enough to cure headaches, it must not be the same plant that Briggs had originally consumed that had caused such intense anxiety and dramatic psychoactive side effects. Nickels responded that she was sure the buttons are the same.

The next year, 1889, Parke-Davis released a tincture called *Anhalonium Lewinii* made from the buttons, which they sold to doctors, wholesalers, and the public. Articles about the plant suggested that it could be used to treat abdominal pain, headache, coughs, asthma, hysteria, and convulsions, that it could be an opium substitute for delirium and irritability, or that it could be a stimulant for those experiencing fatigue of hypochondria. In 1895, Lewin wrote an article about the plant, then called *Anhalonium lewinii*, in the *Therapeutic Gazette*. Early in 1896, two more articles about the plant appeared in the *Gazette*, written by D. W. Prentiss and Francis P. Morgan, as well as James Mooney. These articles detailed some initial human trials of the buttons and the psychoactive effects participants experienced.

Today, peyote is considered a Schedule I controlled substance in the United States, although the plant is still legal for use in Indigenous religious ceremonies and is used in Indigenous communities across North America. In addition, many companies are currently attempting to patent natural and synthetic versions of mescaline for treating a variety of mental health conditions.[6] However, overharvesting in some regions have led the International Union of the Conservation of Nature to list the cactus as "vulnerable" to extinction. The same globalizing forces that Bender said shepherded out the era of rough and ready research have contributed to the decline of the plant across its native range, but the peyote buttons continue to provide powerful spiritual benefits for Indigenous communities.

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6. Journey Colab Corp., Mescaline for the Treatment of Substance Use Disorders (Patentscope, 2022).