



# The Coronavirus, Animals, and Human Health

by Shelley Brooks, Ph.D., CHSSP

**T**he coronavirus, known as the COVID-19 disease, began in China at the end of last year and is now a worldwide health concern. The term “coronavirus” is broad and encompasses viruses such as the common cold. COVID-19 did not exist in humans prior to its recent outbreak. To date, nearly one hundred thousand have become sick and over three thousand have died. By far the majority of cases are in China, but the spread of the disease is slowing there after strict quarantine measures have helped check the spread of this infectious disease. Meanwhile, new clusters of the disease are emerging in countries around the world. The [World Health Organization \(WHO\) is urging](#) people who are sick to stay at home and not infect others in their community. The WHO is also reminding everyone to practice good hygiene – washing hands frequently, and covering coughs and sneezes that can transport the virus to people within about six feet. It is also possible that a person can catch the virus by touching a surface (such as a door handle) recently touched by an infected person, and then touching eyes, nose or mouth. Scientists and health care professionals are studying the new virus and disease to learn more and to try to slow its transmission. The WHO recently declared COVID-19 to be a very high health risk for the global community.

Disease has always been a part of human history, with the types and patterns of disease evolving as humans moved from a nomadic, hunting way of life to more densely populated agriculture-based settlements. Once people and animals

(like chickens and pigs) began to live in close proximity to one another, they began sharing diseases like avian and swine influenza viruses (the flu). Other diseases – like the bacterial bubonic plague – came about through flea-infested rats that clustered where people and their food and waste were. The HIV virus, which can lead to AIDS, began in a different way. A virus originating in monkeys passed to people who hunted the primate for meat; this virus then evolved into the HIV virus. The recent coronavirus is a similar example – it transferred from animals to people in a meat market in Wuhan, China. In this market, vendors kept live, wild animals before butchering them for sale. Regardless of whether viral, bacterial, parasitic, or fungal diseases jump to humans from wild or domesticated animals, these diseases remain in the world long after. Throughout history, diseases originating in one continent eventually reached others through trade and imperial ventures. Today, rapid global transportation spreads diseases much more quickly. Eradicating, or eliminating, a disease from the environment is extremely difficult and rare. These zoonotic diseases (passed between animals and humans) are a clear example of how people, as a part of the environment they inhabit, are impacted by that environment even as they help to shape it.

Over the past many thousands of years, people have set out to shape the numbers and varieties of animals on Earth. One critical way has been through domesticating (breeding and managing) animals to serve specific human purposes. For

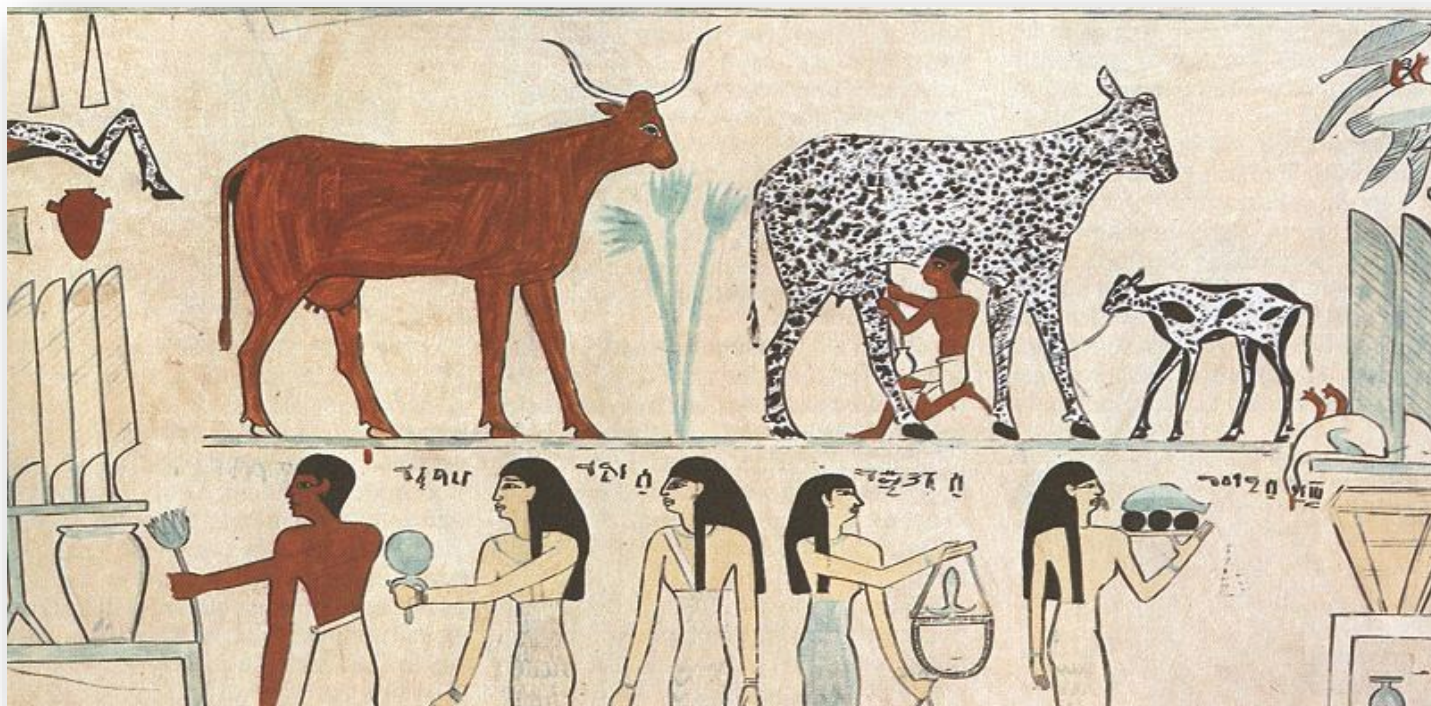


example, domesticated animals have long provided transportation (camels and horses), farm labor (water buffalo and oxen), milk, protein, and eggs (cows, goats, and chickens), wool and fiber (sheep and llamas), protection from wild animals or help in hunting them (dogs), and even companionship. Daily interaction between people and their domesticated animals increases the risk of zoonotic diseases. An example of a deadly zoonotic disease is smallpox, which appears to have evolved from a virus shared by cows. Smallpox is thought to have originated in Egypt over two thousand years ago and then spread through Africa, Europe and Asia in the following centuries, killing roughly three out of every ten people who contracted the disease. Meanwhile, smallpox killed a much larger proportion of people indigenous to the Americas when the disease arrived with European colonists beginning in the 1400s. One theory for why people native to the Americas had a higher fatality rate than people from Afro-Eurasia is because people in the Americas had fewer domesticated animals and therefore had not yet developed immunity to the zoonotic diseases brought from across the ocean.

Today, with close relationships between animals and people firmly established in every country throughout the world, zoonotic diseases cannot be avoided. While no one argues that people should forego relationships with domesticated animals due to the diseases shared between the species, many people argue that there need to be stricter regulations on the wildlife trade that supplies meat and other animal products, as well as [exotic pets](#). [Some are even arguing](#) it is time to end the wildlife trade of even unprotected species such as snakes, frogs, crocodiles and foxes (it is already illegal to trade en-

dangered species, like tigers). This conversation pre-dates today's coronavirus. Back in 2003, the SARS coronavirus – also stemming from the wildlife trade in China – killed 774 people and sickened over 8,000 people. In its wake, Chinese officials temporarily banned the wildlife trade, just as they did soon after the origin of today's recent coronavirus became clear. By late February 2020, China enacted a permanent ban on the trade and eating of wild animals (except for fish and other aquatic animals). While this permanent ban is a major step, the new Chinese law still allows the trade in wild animals for their fur and their use in medicine and research. Those looking to sell the meat of wild animals to customers eager for fresh ingredients are likely to find ways to use the law's exceptions to continue to do so, even if they have to do it secretly, on the black market.

Experts estimate that millions of wild animals, representing hundreds of species, are captured and then traded every day around the world. Capturing and confining a wild animal causes it stress that increases its susceptibility to viruses and infections. These diseases can spread to people while the animals (and their waste) share space in markets and elsewhere. Given the daily interactions between people and animals, wild and domesticated, today's coronavirus will not be the last outbreak of a zoonotic disease. In fact, zoonotic diseases are increasingly common as people continue to spread and settle into once-wild lands and they and their domesticated animals come into greater contact with wild animals. According to the [Center for Disease Control](#), zoonotic disease transmission is the cause of more than six out of every ten known infectious diseases in people, and three of every four new



An ancient Egyptian painting representing the important relationships between people and animals.

infectious diseases in people are zoonotic diseases.

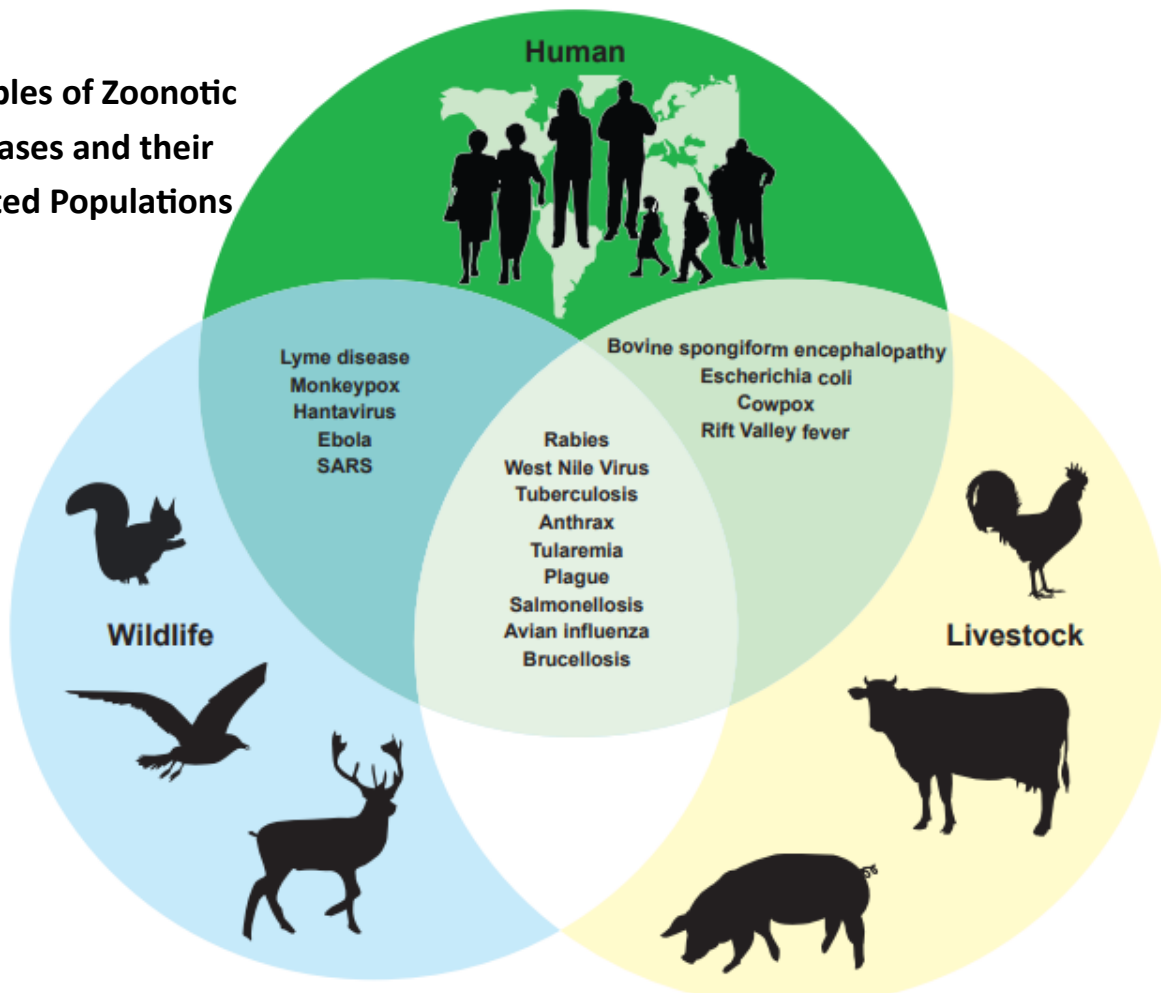
Of course, wild animals are far from problematic in our world. Animals play necessary roles in every ecosystem – keeping the plants in check if they are herbivores, eating other animals if they are carnivores, and doing both as omnivores. Insects, too, are critical, providing food for some of these animals and also pollinating plants. Clearly, the answer to avoiding future zoonotic diseases is not to try to get rid of wild animals. Removing a whole species can dramatically, and negatively, alter an ecosystem. In many instances in the past, people have worked to abolish a particular animal in their region out of safety concerns for themselves or their domesticated animals, or to remove competition for livestock. [Wolves are a prime example](#), as are rattlesnakes and grizzly bears and bison. When people hunt predators to excess, or eradicate important grazing species (like antelope), animals lower on the food chain (like deer and rodents) become more numerous. This can lead to population stresses that make wild animals more susceptible to disease, and more likely to come into contact with humans, for example in search of food.

More generally, when certain animal or plant species become

endangered or extinct, the Earth loses some of its remarkable biodiversity and human health suffers. Preserving biodiversity is important enough to human health that the [World Health Organization raises concern](#) about the impact of [deforestation](#), climate change, urban sprawl, and other human-induced changes on the patterns of infectious diseases. The WHO explains how humans fare best in healthy and diverse ecosystems that provide fresh water, food, biomass fuel (wood, dung), and natural elements for traditional and synthetic medicines. A healthy environment is critical to human health.

Global travel today enables the rapid spread of a virus far beyond its origin, and world trade leaves workers and businesses financially vulnerable when a disease outbreak slows commercial production. We therefore face challenging new questions about how to protect against future outbreaks. What is a reasonable amount of health risk to entertain in order to support economic growth, or to respect regional food and medicinal practices that involve wildlife trade? What proportion of limited financial resources do we commit to protecting biodiversity or to creating stricter international monitoring of the wildlife trade? And, will we as a global population sustain interest in protecting against future disease outbreaks after the spread of the coronavirus is contained?

## Examples of Zoonotic Diseases and their Affected Populations



Today's coronavirus has both global and individual-scale impacts. This makes it similar to other diseases over time, and yet there are distinct differences between disease outbreaks in the distant past (like the Black Death) and today. The following primary sources are broken into two sets: COVID-19/Coronavirus and the Black Death/Plague in the 14th Century, which was transferred to humans by the bite of an infected flea. Keep in mind that the Black Death killed an estimated 75 million people out of a total global population of around 400 million; today's coronavirus has to date killed approximately 3,000 people (of the 7.5 billion people on Earth). The secondary source in the preceding pages focused on the environmental conditions that contribute to the transmission of zoonotic diseases. The following primary sources examine some of the social and economic impacts of disease outbreaks. Discussion questions follow each section. Citations are on page eight.

### ***Primary Sources from the COVID-19/Coronavirus Outbreak***

**Source #1:** *Excerpt from a recent newspaper article about health-related measures taken in Italy to limit the spread of COVID-19:*

"The Italian government has ordered the closure of all schools and universities nationwide until 15 March as it grapples to contain Europe's worst outbreak of coronavirus, which has claimed 107 lives, an increase of 28 in 24 hours.

On Wednesday evening, it confirmed that all major sporting events, including Serie A football, would be played behind closed doors (without spectators) due to the outbreak until 3 April.

"We are focused on taking all measures for direct containment or delaying the spread of the virus," the prime minister, Giuseppe Conte, said as he announced the most stringent containment measures outside Asia."

**Source #2:** *A recent NPR article on xenophobia (the fear or hatred of foreigners) during the coronavirus outbreak includes accounts of people who report being the victim of xenophobic reactions here in the United States:*

"Allison Park from Brooklyn told us that when visiting D.C., she saw a man making faces at her on the Metro train. She tried to move away from him, but he wouldn't stop. After a while, she said, he confronted her outright, saying: "Get out of here. Go back to China. I don't want none of your swine flu here." A week later, on a Muni train in San Francisco, another man yelled the same thing to her — "Go back to China" — and even threatened to shoot her."





**Source #3:** *The World Health Organization is part of the United Nations and oversees all matters related to international health. It is a trusted source for countries to turn to to learn more about specific diseases and disease prevention.*

WHO's strategic objectives for this response (to COVID-19) are to:

- Interrupt human-to-human transmission including reducing secondary infections among close contacts and health care workers, preventing transmission amplification events, and preventing further international spread\*;
- Identify, isolate and care for patients early, including providing optimized care for infected patients;
- Identify and reduce transmission from the animal source;
- Address crucial unknowns regarding clinical severity, extent of transmission and infection, treatment options, and accelerate the development of diagnostics, therapeutics and vaccines;
- Communicate critical risk and event information to all communities and counter misinformation;
- Minimize social and economic impact through multisectoral partnerships.

\*This can be achieved through a combination of public health measures, such as rapid identification, diagnosis and management of the cases, identification and follow up of the contacts, infection prevention and control in health care settings, implementation of health measures for travelers, awareness-raising in the population and risk communication.

**Source #4:** *The coronavirus has impacted the stock market as people wonder how long the disruption to business and trade will continue. This image was created by a private individual to represent the stock market decline in recent weeks.*



Discussion questions:

- What are some large-scale, global impacts of the coronavirus?
- What are some of the ways the coronavirus affects individuals?
- Through what actions does the World Health Organization recommend limiting the spread of the virus? Why do you think the WHO wants to counter “misinformation” about the virus?
- Why do you think the coronavirus has made financial investors worried about the global economy? How does source #4 of the stock market plunge relate to the xenophobia expressed in source #2?

## ***Primary Sources from the Black Death***

**Source #5:** *Agnolo di Tura, a writer from Siena, Italy, described what happened in his city in 1348:*

Father abandoned child, wife [abandoned] husband, one brother [abandoned] another. . . . And no one could be found to bury the dead for money or friendship. . . . And I, Agnolo di Tura, called the Fat, buried my five children with my own hands. . . .

**Source #6:** *Josse Lieferinx, Saint Sebastian Interceding for the Plague-Stricken, 1497-1499, Europe:*



**Source #7:** *Of the plague in Cairo, Egypt Al-Maqrizi wrote in the early 15th century:*

Streets were full of dead bodies, the mosques . . . were full of dead bodies, without anyone to bury them. The markets became deserts. . . . Cairo became an empty desert, and there was no one to be seen in the streets. A man could go from the Zuwayla Gate to the Bab al-Nasr without encountering another soul. The dead were so numerous that people thought only of them. . . . Wailing could be heard on all sides, and you did not pass a house without being assailed by shrieks.



**Source #8:** Giovanni Boccaccio witnessed the plague in Florence, Italy. In his work, the Decameron, he wrote:

Some people . . . formed themselves into groups and lived in isolation from everyone else. . . . [T]hey locked themselves in. . . Others took the opposite view, and maintained that an infallible way to warding off this terrible evil was to drink heavily, enjoy life to the full, go round singing and merrymaking, [and] gratify all of one's cravings. . . . In the face of so much affliction and misery, all respect for the laws of God and man had virtually broken down and been extinguished in our city.

**Source #9 :** This drawing comes from a manuscript from 1376/77 that is archived in the Royal Library of Belgium. It depicts the massacre of Jewish people in Europe during the Black Death. In some places where the Black Death occurred, residents blamed the disease on the local Jewish population, believing them to have intentionally spread the disease.



**Source #10:** Ibn Battuta, a North African Muslim scholar and explorer, traveled through areas stricken by the Black Death. He wrote that in Damascus, Syria where the plague was killing 2,000 people per day:

The people fasted for three successive days . . . [Then] the amirs . . . and all other classes of people . . . assembled in the great mosque . . . and spent Thursday night there in prayers . . . [The next morning] they all went out together on foot carrying Qurans in their hands – the amirs too [were] barefooted. The entire population of the city joined in . . . the Jews went out with their book of law and the Christians with their Gospel, their women and children with them. . . [begging] the favor of God through His Books and His Prophets.

Questions to consider:

- What were some large-scale, global impacts of the Black Death?
- What were some of the ways the Black Death affected individuals?
- How did people in the 14th Century understand the origin of the Black Death, or the possible cures? How did this differ in Europe (sources #5,6,8,9) and in the Muslim world (sources #7,10)? How did people receive information about the disease?
- What evidence is there for how the Black Death affected the economy?
- What similarities and differences do you see between the coronavirus and the Black Death?



# California Education and the Environment Initiative

A program of CalRecycle's Office of Education and the Environment, [EEI lessons](#) are designed to foster environmental literacy among California students. Below is a list of units and lessons to support student learning on the topics of disease and public health, trade, agriculture and biodiversity.

**2nd Grade 2.4.2/3** [The Dollars and Sense of Food Production](#)

**3rd Grade 3.5.1/2/3** [California's Economy: Natural Choices](#)

**4th Grade 4.2.6** [Cultivating California](#)

**6th Grade 6.1.2** [Paleolithic People: Adapting to Change](#)

6.2.2 [Agricultural Advances in Ancient Civilizations](#)

6.2.6/8 [Egypt and Kush: A Tale of Two Kingdoms](#)

**7th Grade 7.2.5** [Arabic Trade Networks: Growth and Expansions in the Middle Ages](#)

7.6.3 [Managing Nature's Bounty: Feudalism in Medieval Europe](#)

7.7.1 [Sun Gods and Jaguar Kings](#)

7.7.3 [Broken Jade and Tarnished Gold](#)

**8th Grade 8.12.1** [Agricultural and Industrial Development in the United States \(1877-1914\)](#)

**10th Grade 10.3.3** [Growth of Population, Cities, and Demands](#)

**11th Grade 11.11.5** [Many Voices, Many Visions: Analyzing Contemporary Environmental Issues](#)

**12th Grade (Econ) 12.2.2/7** [Sustaining Economies and the Earth's Resources](#)

**12th Grade (Gov) 12.7.6** [Making and Implementing Environmental Laws](#)

**Image citations:** cover photo [https://commons.wikimedia.org/wiki/File:Ducks\\_in\\_cages\\_at\\_wet\\_market,\\_Shenzhen,\\_China.jpg](https://commons.wikimedia.org/wiki/File:Ducks_in_cages_at_wet_market,_Shenzhen,_China.jpg); Egyptian livestock <https://www.flickr.com/photos/chainedreactions/2392901730/>; zoonotic disease <https://www.gao.gov/assets/590/586047.pdf>

**Coronavirus citations:** Source #1: <https://www.theguardian.com/world/2020/mar/04/italy-orders-closure-of-schools-and-universities-due-to-coronavirus> ; Source #2: <https://www.npr.org/2020/03/02/811363404/when-xenophobia-spreads-like-a-virus> ; Source #3: [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200304-sitrep-44-covid-19.pdf?sfvrsn=783b4c9d\\_6](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200304-sitrep-44-covid-19.pdf?sfvrsn=783b4c9d_6) ; Source #4: <https://pixabay.com/illustrations/stock-exchange-financial-crisis-4880802/>

**Black Death citations:** #5 Agnolo di Tura, trans. by W. M. Bowsky in *The Black Death: A Turning Point in History?* (New York: Holt, Rinehart and Winston, 1971), 13-14; #6 Josse Lieferinxe, *Saint Sebastian Interceding for the Plague-Stricken*, 1497-1499, Courtesy of the Walters Art Museum and Wikipedia Commons: [https://commons.wikimedia.org/wiki/File:Josse\\_Lieferinxe\\_-\\_Saint\\_Sebastian\\_Interceding\\_for\\_the\\_Plague\\_Stricken\\_-\\_Walters\\_371995.jpg](https://commons.wikimedia.org/wiki/File:Josse_Lieferinxe_-_Saint_Sebastian_Interceding_for_the_Plague_Stricken_-_Walters_371995.jpg); #7 Al-Maqrizi, quoted in André Raymond, *Cairo*, translated by Willard Wood (Cambridge, MA: Harvard University Press, 2000), 139. ; #8 Giovanni Boccaccio, *The Decameron*, quoted in Rosemary Horrox, ed., *The Black Death* (Manchester: Manchester University Press, 1994), 28-29.; #9 Representation of a massacre of Jewish people in 1349, from the Royal Library of Belgium and Wikipedia: [https://upload.wikimedia.org/wikipedia/commons/9/93/1349\\_burning\\_of\\_Jews-European\\_chronicle\\_on\\_Black\\_Death.jpg](https://upload.wikimedia.org/wikipedia/commons/9/93/1349_burning_of_Jews-European_chronicle_on_Black_Death.jpg); #10 Ibn Battuta, C. Defrémery, B.R. Sanguinetti, C.F. Beckingham, and H.A. R. Gibb, trans. and eds. *The Travels of Ibn Battuta, A.D. 1325-1354* (Cambridge: Hakluyt Society at University Press, 1958-2000), I: 143-144.

## **Current Context: A Publication of the California History-Social Science Project**

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