

“Smallpox or Bartonellosis?": Comment on “Epidemics and Demographic Disaster
in Colonial Latin America: A Reassessment”

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Session 9 of the joint AHA-CLAH session of the 2004 Annual Meeting of the American Historical Association, Washington, DC, on Friday 9 January, organized by Robert McCaa, was devoted largely to an examination of various arguments found in N.D. Cook's Born to Die: Disease and Conquest, 1492-1650 (Cambridge University Press, 1998).

Title: “Epidemics and Demographic Disaster in Colonial Latin America: A Reassessment”

Chair, John Marr, Independent Scholar

1) Massimo Livi-Bacci, “Multicausality of the Catastrophe: Theory and Facts”

2) James B. Kiracofe, “A Case of Mistaken Identity! Leprosy, Measles, or Smallpox? Old World Names for a New World Disease: Bartonellosis”

3) Robert McCaa, Aleta Nimlos, and Teodoro Hampe-Martínez, “The Death of Huayna Capac Re-Examined”

4) Rodolfo Acuña-Soto, “The Climate Connection: Large Epidemics of Hemorrhagic Fevers in Mexico in the Sixteenth Century”

Comment: Noble David Cook, Florida International University

NOTE: The critique, as prepared for the panel, is being revised and expanded for publication. If quoted cite properly as a draft. Please direct any comments to N.D. Cook at cookn@fiu.edu

N.D. Cook's Critiques:

Critique of the McCaa, Nimlos, Hampe-Martínez paper:

Premise 1. “...the documentary basis for the existence of a smallpox epidemic in this region [Peru] before 1558 is both thin and contradictory.” The authors state that this is in contrast to Mexico, where [not a surprise at all] there is a broad range of evidence, because the Nahua wrote, and the Spanish were there at the time of the epidemic event and also described its ravages. The authors conclude that “the negative evidence continues to mount for the early introduction of smallpox...”

Contra 1. What is the negative evidence? The author's presentation of "negative evidence" must be convincing, and other than their "voice" of authority the evidence is far from convincing. They state “smallpox is the explanation given by six of the seventeen chroniclers...” Let us briefly examine the primary documentary evidence. First, let us remove the post-1570s sources from their Table. I do so because I give primacy to the earlier sources, especially since much written following the 1580s was

based on earlier published accounts, or on increasingly fading memories of native informants who were in their teens in the 1520s. Second, a word of caution: as Franklin Pease has so vividly pointed out, it was over a decade before the meaning of many words and concepts were understood. The youths taken to be trained as translators by the Pizarrists were frankly opportunists who were individually out to make the best for themselves in a rapidly changing world. They lied, twisted, mistranslated, as the encounter between the two worlds unfolded, from the coast at Puna to the plaza of Cajamarca and beyond. The whole of the '30s was a period of misinformation [Pease, *Crónicas*, 21]. Further, there were too few religious in the Peruvian venture, and too much instability within the ranks of the Spaniards. It would take a decade before enough Spaniards and Andeans learned their enemies' tongues well enough to begin to build a better understanding of the "others" cultures. No wonder the first dictionary, good but incomplete, was not published until 1560, almost 30 years after the initial events. In the Table the authors identify 9 sources before 1572 that mention Huayna Capac. Seven record he died of a sickness.

To me it is quite amazing that Francisco de Xerez in 1533 mentions that Atahualpa said Huayna Capac died of "that sickness" [aquella enfermedad], in 1524. Xerez was somehow able to extract from Atahualpa, through one of the translators a sketchy account of his father's death a few years earlier. Another Spaniard, Pedro Pizarro, the page and 17 year old relative of the leader of the expedition, also spoke to Atahualpa in Cajamarca in 1533. According to Pedro Pizarro, Huayna Capac "sickened from of the illness of smallpox" and died [Lockhart, *Men*, 220n, 156n]. So the two Europeans somehow communicated with and reported that Atahualpa told them that Huayna Capac died of a sickness, which Pedro Pizarro identified as smallpox. Xerez's information is immediate, since his text was published in 1534. Unfortunately Pedro Pizarro composed his narrative of the conquest in 1571, a decade before he died, and his recollections may have been influenced by others. [Two other soldiers did not mention the cause of death of the Inca, in fact Pedro Sanchez de la Hoz did not mention the ruler at all. Why, because we have to understand the "aim" of the cronista; was it to describe the actions of the Spanish, or to understand the pre-Spanish past? Most were only interested in the Spanish actions, so these we need to simply delete from our data base.]

Our next early source is governor Cristóbal Vaca de Castro, who arrived in 1541, shortly after the assassination of Francisco Pizarro. In order to better govern the land, he collected reports [*informaciones*] of the Inca past. He also attributes the sickness to a "pestilencia de viruelas" [smallpox]! Who were his informants? The record-keepers, quipucamayos or elders in Cuzco. So it seems that in the early 1540s the educated Andean elite, the people specifically trained to keep record, Quechua speakers, had labeled smallpox as the sickness from which Huayna Capac succumbed. Vaca de Castro's translator was indio ladino Pedro Escalante, although Betanzos and other Spaniards who had learned some Quechua assisted in the inquiry [Pease *Crónicas*, 22-23; a word of caution, the copy of Vaca de Castro's *informaciones* we may have been prepared around 1608].

In my estimation our two best early sources are Pedro de Cieza de León and Juan de Betanzos, who were investigating the Inca past in the 1540s, and finalizing their texts in the early to mid-1550s. Neither was published until the modern era. Cieza de León consulted with Betanzos in Cuzco, for he knew he was an important source for information, especially since he prepared a Quechua dictionary and grammar [lost]. Cieza finished his text earlier, for he took all his mss and returned to Spain where he died in 1554. The principal informants concerning the death of Huayna Capac for both accounts seem to be from Cuzco, although Cieza absorbed information on northern Andean events during his

travels in Colombia in the 1530s. Both Cieza and Betanzos used their native women for information. Betanzos' wife was ñusta Cusi Rimay Ocllo, who had been concubine of Francisco Pizarro. Betanzos questioned at length his wife's relatives as well, and he consulted the quipucamayos of Cuzco. When the phrase in their narratives "cuentan que" appears they refer to their sources of information. McCaa et al caution that various chroniclers used words such as "cuentan que, unos dicen, otros dicen, aunque otros dicen," and warn "Were chroniclers who used this sort of phrasing seeking to caution the reader that the author was unable to judge and instead was relying on hearsay?" The reality is that many used that terminology because they were referring to their source for the events: quipucamayos, the elderly orejones, or other native eyewitnesses who were elders of the communities, or in the case of some cronistas, family relatives who were eyewitnesses of the disastrous 1520s. In other words, "cuentan" refers to their informants, that is, oral history.

Cieza does speak unequivocally of a very contagious "gran pestilencia de viruelas," reporting that Huayna Capac's demise was the direct consequence. Betanzos by contrast says he died of an illness that took away his reason and understanding and gave him a "sarna and lepra." Why the variation? Here I believe Betanzos queried his informants, pressing them to describe the symptoms of the sickness. How do you as an Andean describe what was occurring? Smallpox was after all an alien intrusion. Sarna according to the late sixteenth early seventeenth century Covarrubias, compiler of the first major Spanish dictionary, is "una especie de lepra, aunque no tan mala como la elefancica, porque aquella roe no sólo el cuero, pero come la carne." What are the symptoms of lepra? For lepra Covarrubias defines "la lepra cubre el cuero con una fea costra o escama por partes blanca, por partes negra;..." He goes on to say the origin comes from a Greek term meaning "áspero, profundo y blanco, concurriendo todas estas tres calidades en la lepra, que hace áspero el cuero, va comiendo las carnes, y tiene en partes aquella color blanco." He continues there are "muchas especies de lepra." With the classical long term deadly lepra the obvious symptom will be the falling off of parts of the flesh. In the Andes the symptoms of uta are well described in the literature, as it works its way over the extended course of the disease the fleshy parts of the face, the lips, the nose, fall away. And leprosy in the European context leads long term to similar loss of body parts. Does lepra or sarna exist in explosive epidemic [gran pestilencia] form? 200,000 deaths in a short time? I really don't think so. What the informants are telling Betanzos is what they have seen, or have heard, that is the person who is sick [that they have high fevers is a given, with delirium in extreme cases, and melancholy is only too obvious] has skin covered with scabs, some whitish, others turning black, and that the skin often fell off. My conclusion is that Betanzos provides the symptoms of smallpox as given by his wife's relatives and quipucamayos. I admit that some may read otherwise. So the joint author's argument that Cook should have re-assessed the smallpox thesis is specious, I did consider it, and I still opt for smallpox, and view Betanzos as collaborative evidence rather than antagonistic.

Our joint authors provide Alonso Borregán as an example of someone who does not mention smallpox. Writing around 1565, he reports Huayna Capac died of a sickness that "should have been perlesía." Who is this Borregán? According to Porras Barrenechea he was little more than a "frustrated graverobber." His chronicle was not published at the time, and according to Porras, never should have been published ["ni se perderia ahora con que permaneciera inédita"]. It is characterized by "desorden, e incoherencia mental, la temática repetición de ciertos tópicos y letanías, y el estilo empedrado de idiotismos." So I will not waste time analyzing why he introduced paralysis or stroke, I simply reject it as fantasy.

One other source merits evaluation, because it too is based on the quipucamayó informants of Cuzco. That is Pedro Sarmiento de Gamboa. He states Huayna Capac died of “fevers, although others say of smallpox and measles.” Our authors mention fevers, but without the important qualifying phrase. Fevers yes, this is obvious because high fevers are a common symptom of all the mortal infections we are examining. Skin rashes are a common consequence of high fevers.

I reject the post-1572 sources as derivative. They have nothing new to add, and in fact often confuse. What do these sources before 1572 tell us? All indicate the Inca died from a sickness, and the best sources give smallpox or symptoms that parallel smallpox. Measles as mentioned by Sarmiento de Gamboa will appear in later accounts. You may question why I do not include the famous mestizo chronicler Garcilaso de la Vega? The answer is simple: he is a novelist, and is recognized as such. As an historian he cannot compare to Cieza de León, who wrote his account while Garcilaso was still a child.

I will return to review the clinical evidence for smallpox when we evaluate the mummy thesis.

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Premise 2. The authors argue for a more skeptical approach to the destruction of Tahuantinsuyu, and “urge historians to take greater account of a wider-range of unconventional sources, such as linguistic evidence from early Quechua dictionaries, lessons learned from the World Health Organization’s campaign to eradicate smallpox, physical descriptions of native peoples, and the examination of mummies for signs of smallpox, or the lack thereof.”

Contra 2. The authors’ query “If smallpox caused such devastation in Peru before 1550, including the death of Huayna Capac, why is there not a single term associated with it in Domingo de Santo Tomas’s dictionary?” Accepting at face value your joint statement, my original rebuttal was that smallpox occurs once each generation. The first epidemic appeared swiftly, took its toll, then died out, leaving a memory, but no Quechua word, at least for the Spanish or the McCaa et al group to find. But after further examination of the 1560 dictionary, I reject their premise. I believe there is a word that the Quechua informants used for smallpox, a word that as the English term, describes the symptoms. To do so, I refer to Juan de Betanzos, who provides McCaa with the argument that given he wrote the Inca died of a: “sarna y lepra” [it] “might have called for a re-assessment of the smallpox thesis.

Unfortunately this has not been the case.” Let us re-evaluate. Betanzos discussed this issue with his native informants, as he was obviously interested in what caused the death of the ruler, which led to such chaos. They told him it was a “blank” which was “una” indefinite, yes, because it was not sarna or lepra, but something they did not know before but that had similar symptoms. What was the Quechua label the informants provided? It was “Caracha” [scabs]. What makes me say this? Because when Domingo de Santo Tomas was preparing his dictionary he ran into the same problem, he provided the Spanish words sarna and lepra to his informants and discovered the Quechua response was caracha. Note Table 2 of McCaa is incomplete, the left column for Santo Tomas should have “lepra, sarna”.

Note also that later Juan de Santa Cruz Pachacuti Yamque uses the word, coupled with measles. Why? His account was prepared after an epidemic series that likely colored his description, that catastrophic 1587-91 compound series that included in quick succession measles and smallpox, as well as other diseases. The joint authors use his report to indicate measles, not smallpox. Yet read his description of the symptoms: “pestilenica de sarampion y assi dentro de dos dias muere el general mihic

naca mayta con otros muchos capitanes todo *Las caras llenos de caracha....*" You don't die from measles with your face covered with scabs, you DO die from smallpox in that fashion. I therefore believe the Quechua word that the informants consulted by Betanzos, and Domingo de Santo Tomás used for smallpox, was caracha.

McCaa et al further state: "To round out this linguistic excursion, we must also consider terms that do not appear in any of our sources." One of the "missing" words was tos [or cough], but I found it without difficulty in Santo Tomas; he just spelled it tosse. Let us be today more careful. In fact, the compilers of the Table may have missed important points when it comes to disease, which taken as a whole, negate significant parts of their argument; indeed we may uncover evidence that might severely damage the propositions of Kiracofe.

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First, sicknesses associated with coughing:

tosse=vhuy

tossegoso, que mucho tosse=vhucçapa

tosser=vhuni,giu

pechuguera, dolencia=carca Covarrubias def: "la tos que está asentada en el pecho."

Influenza: romadizo=chulli Covarrubias def: "catarro"

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Words associated with general illness:

huncuni.gui.o quixiani.gui=enfermar generalmente

huncuy, o quixiay=enfermedad

huncuc, o quixiac=enfermo

huncusca= doliente, enfermo

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Malaria: Intriguing in the Santo Tomas dictionary is the use of "rupay huncoy" for terciana, calentura, as well as a blank space after the Spanish for calentura quartana, which suggests the presence of tercian fevers [tercian malaria] and the absence of quartan fevers.

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Measles?: peca, o manzilla de la cara=mirca oya

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Mumps: Paperas is under papo, o papera, but Santo Tomas does not mention garanta, so to..

cottoyani.gui=tener papo en la garganta

cottoconga, o choppoconga=papo o paperas de la garganta

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Syphilis?: Strikingly absent from the dictionary of Santo Tomas is the word for syphilis, endemic in the Americas. The normal Spanish word is bubas, and it does not appear in the list of Spanish to Quechua.

But, shifting to the Quechua to Spanish and moving in that direction you discover:

quea=materia, podre

quee, o querce=materia de llaga

quee çapa=llaga con materias

queree çapa=llagoso, lleno de llagas

querecyani.gui.o chopoyani.gui=apostemarse, con postema, o llaga

now back to Spanish apostema=quere, o chopo — These are common descriptives for syphilis.

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bubonic plague?: now back to Quechua choppo=encordio, a less common Spanish term. Covarrubias defines it nicely as "seca maligna, nace en las ingles", ie swelling in the glands, the groin. The words are often descriptive of symptoms of bubonic plague.

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Diarrhea, bloody stools: quea=materia, podre
quechac=doliente de camaras
quechani,gui=puxo de vientre, o tener camaras

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Leishmaniasis, Uta?: carcoma de muertos=çarça, o vecca Covarrubias: "hay cierta enfermedad que va royendo la carne del hombre,... que es cierto especie de cáncer." Could this be Santo Tomas's equivalent for what we call today uta?

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Jaundice, hepatitis?: itericia enfermedad=chocñi Covarrubias, "enfermedad muy conocida y ordinaria, cuando el rostro y cuerpo se pone un color amarillo."

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Meningitis?: modorro, o bono=vtic, o caeca o opa Quechua to Spanish: bono, o loco
doliente de la cabeza=homa manta huncufca
flaca, cosa doliente=llaca

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Bartonellosis? One would expect for example that since Carrion's disease, verruga peruana was endemic, it would have appeared in Santo Tomas, and it did. Berruga, o peca de la cara is moro, ticti o rimpicota. When you check the Quechua rimpicota you discover it also means barro, or pimple, o berruga [literally wart]! Moroyani,gui means nacer [appear] berrugas. Moro çapa, o rimpicota means berrugoso. If Huayna Capac had died of verrugas why would not one of the native informants used one of these terms?

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Muscular cramps: Calambre, enfermedad de tomar=çuçuncani Covarrubias def: a cramping, often after heavy exercise

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"roña, o sarna" roñoso, o lleno de roña=caracha çapa Covarrubias, scabies afflicting livestock

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The logic of the author's digression into a word count based on Assadourian in 1994 to demonstrate since we have so many words relating to death and destruction at the sword and hand of the conquistadores, and "none" for smallpox, and few for devastating diseases confuses me. Is it any surprise that the terminology of warfare is rich? And the vocabulary the richest? The Inca and the Spanish were imperialists, and their military exploits were recounted endlessly. And therefore the wordcount concerning bellicosity and exploitation in the dictionaries is high. It tells of the Spanish and Inca concerns for war and conflict. But we have just found by a more thorough examination of the earliest Quechua-Spanish dictionary that sickness and health was a constant preoccupation of the inhabitants. The vocabulary is rich and varied, as we find in Domingo de Santo Tomas. And we have

seen that even the arguments of the joint authors that there was no word for smallpox in 1560 needs to be re-evaluated on the basis of our only too brief exercise.

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Premise 3. "We conclude that... the preponderance of the evidence points to a late introduction of smallpox... 1558...."

Contra 3. The authors provide no description of this epidemic at all! Let us see in detail your arguments. I am very interested.

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Premise 4. "The principal causes of the disaster before 1558 were decades of civil war, destruction, and oppression."

Contra 4. No one who knows the history of Andean America from the quarter century 1530-1555 would dispute the fact that fratricidal strife, civil war, and native rebellion, and the rampant encomienda system especially prior to the New Laws of 1542 were major factors in both European and Amerindian deaths. The issue then is over the joint author's choice [as well as that of Sempat Assadourian who they cite] of the term "principal." What number dies of sickness, epidemic or endemic, associated with disruption of food supplies, as opposed to strife? An answer requires quantification, but as we all know, some of the most important historical questions are not quantifiable, and this is one that defies easy quantification. I for one, who has done a lot of number crunching have not tackled this issue directly. A number of years ago one historian of the Caribbean attempted a simple exercise, and took the number of Spanish on Hispaniola, and the supposed number of Taino, and found that the Europeans would have had to work at killing 24 hours a day to account for the number of Taino lives lost up to the then first documented smallpox epidemic in 1518.

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Premise 5. The authors posit that "the examination of mummies for signs of smallpox, or the lack thereof" will provide us the answers we are searching for.

Contra 5. There are several problems with this suggestion. A) First is the nature of smallpox. As Dixon pointed out four decades ago, there are several types, with different levels of mortality. With direct communication, lungs to lungs by infected droplets, hemorrhagic smallpox will cause the death of 99% plus of victims, no matter what the health care or medications, with intense fever and coma being the most visible symptoms, plus, blood from the lungs. There will be no pox on the skin, because one is dead before the symptom which labels the disease is visible. With minor forms of the smallpox, pox marking may be minor, as with chicken pox, hence no evidence on the flesh. With the more severe forms, the flesh will fall off the victims in sheets or chunks. Doesn't leave much to examine for pox marks, does it?

B) Now to examine preservation of the remains. In major epidemics normal burial practices which preserve the body in societies that bury their dead tend to break down. Mass graves, shallow burials, quick decomposition of the flesh occurs. Insufficient care will lead to desecration by dogs, rodents, vultures, any eater of carrion. Then in the case of the Andes, huaqueros [grave robbers] in search of treasure are always a problem. The cronista Borregán was reputedly a notorious graverobber. And

there was enough gold and silver buried to be tempting in the 16th century, so much so that huaqueros presently continue their illegal occupation. What of the famous mummy bundle of Huayna Capac? First, which form of smallpox did he die from, if indeed it were smallpox? Also, note, those with the most obvious symptoms, that is healing scabs, frequently survive. SO he might have died when the pustules were at their freshest, and the skin the most under attack. What type of archaeological evidence would we then have? We are uncertain. Only a classical form in which the scabs would have appeared would permit identification if there were poxmarks left in preserved flesh.

Second, and just as critical, what was the nature of the burial? Deserts are the ideal location to find studiable mummies, for the best preservation of human flesh remains is in areas of near zero humidity, or below freezing temperatures. The Inca died in highland Ecuador, in an area of relatively high humidity and moderate daytime temperatures. The viscera were removed. The body was flexed in the traditional way, sitting with knees to chin, the arms folded around the legs. The mummy wrapped in the form of a bundle, with several yards of cloth. It was then carried to Cuzco, a thousand kilometers to the south, via the highland route. In the rainy season there would be virtually no way to prevent the bundle from repeated soakings. But we do not know what months the death and transfer of the Inca's huaca occurred. It may not have been the rainy season at all. But imagine the trip, taking many days since there was no rush to reach Cuzco. The jostling, the changes in temperature and humidity, all must have contributed to decay. Then according to our account the mummy was taken to the lands of Huayna Capac's lineage, at lower elevation and higher humidity than Cuzco, where it remained until brought back to Cuzco around 1565, conveniently seen by Garcilaso de la Vega, then to be transported to Lima where it was placed in a Hospital in Lima. Again the movement meant increased chance of soaking. But finally Lima, and the desert. But wait! In spite of the fact Lima is in a desert, it does not mean there is low humidity. In fact for months at a time each year it approaches 100%! A mummy bundle placed carefully deep enough in the earth might survive. But this one as we have seen was on public display in the patio of the hospital! Finally whatever was left was deposited somewhere under the tiles, either in the chapel or perhaps in one of the patios. If Huayna Capac had been a rich Christian we would have documentation in the notary record, the contract between the family and the institution for the burial. Often such contracts specify the exact place of burial. Huayna Capac, by now probably resembled a collapsed bag of chuño [freeze dried potatoes], would have been unceremoniously dumped wherever there was space, as would be the fate of any common folk. We should remember too that Huayna Capac was not a Christian, which should make us even more cautious about his place of burial. Several hundred years later, when archaeologists begin excavations, they are likely to find masses of bones, and some pieces of cloth and other fragments, beneath the structure and its appendages. Just as they have found in the Franciscan Church and monastery in Lima. I too talked at length with archaeologist Guillermo Cock in November, six weeks after one of the co-authors, and he was not expecting to find mummies with skin pox, even in the better preserved contemporaneous cemetery of Puruchuco.

Premise 6. This is really interesting! Since there is no reference to anyone with visible smallpox before the 1560s, it did not exist.

Contra 6. What is the frequency of physical descriptions in the 16th century Spanish world? Where would we find physical descriptions of the common folk? Actually physical descriptions are rare. In normal legal documents the name, sex, age, residence, and relation to the other person is given, and that

is all. Paintings of individuals are rare, and paintings of commoners even rarer. The handful of paintings by Velasquez [a century later] that show us commoners, beggars, children with lice, the scabies, are so important because they are so unique. Smallpox was endemic in Seville. Do we see smallpox on any faces depicted? Would we expect to discover smallpox scars on the faces of the Seville elite painted by Francisco Pacheco? We know Elizabeth of England came down with smallpox as an adult and almost died, are paintings of her marred by scars? Of course not. The only place in the documents where we do find mention of smallpox scars is in the licenses to travel to the Indies, the 16th century equivalent of the passport. Yet of hundreds of licenses I have examined fewer than 1 percent mention smallpox scarring; yes knife or gunshot wounds, but smallpox so rare as to be meaningless as an indicator of the prevalence of smallpox in a human population. What of the incidence of other diseases? In paintings and sculpture we have the saint, or saints associated with the bubonic plague depicted. But a saint of smallpox, or measles? No. And were there Amerindian saints associated with sickness that would be depicted suffering from the illnesses they were to assist in curing? No.

Now what of Andean commoners? The description of Inca Titu Cusi Yupanqui by Juan de Matienzo in 1565 is unique. The reason is obvious. When did he contract smallpox? The description provides no information on the date. It could have been anytime following his infection. I have examined information on thousands of Andean peoples in 16th century censuses. Their sex, name, age, marital status, role in the community, and economic resources are recorded. But we have no description of smallpox marks on their skins before or after 1565, even when the censuses were made a year or two after a known and fully described epidemic occurrence, as in the census of Yanque Collaguas in 1591. So the assumption that no marks equals no smallpox is therefore proof there was no smallpox is simply a false assumption, and I leave it at that.

Critique of the Kiracofe paper:

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Premise 1. "It is easy to understand how the early Spanish chroniclers might have mis-identified the cause of the 1524 epidemic that killed the Inca and many others,..."

Contra 1. I have reviewed my reasons for my confidence in the earliest documents of the identification of smallpox as the European understanding of the disease that killed Huayna Capac in the critique of the MaCaa et. al. paper. That they may have been mistaken is possible, one cannot deny that. Even today medical scientists have problems identifying contemporary disease. So, does the Kiracofe thesis provide evidence to support a paradigmatic shift away from smallpox? Let us examine the premise.

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Premise 2. "We believe, based on what is now known, the cause of Huayna [sic.] Capac's death was more probably bartonellosis."

Contra 2. The symptoms of one form of bartonellosis are, as you have all so vividly seen on the slides, quite similar to one form of smallpox. Simple examination of the skin lesions and scabs without modern microscopic evaluation might lead to confusion. But always remember, it might look like a duck, quack like a duck, but might not BE a duck! Let us look more closely at the disease, and especially its transmission.

Bartonellosis, also known as Carrión's disease, is caused by a bacterial infection, normally transmitted in humans by the bite of sandflies [Phlebotomus verrucarum, identified by Charles Townsend in 1913]

that carry the bacteria. As with the mosquito in the case of malaria, it is the female that counts. There is an animal reservoir. The environment of the carrier is limited to certain elevations, valleys in the Andes, between 2,100 to 7,500 feet. It was endemic in the Andes before European arrival, and depicted in pre-Columbian ceramics. The bacteria are of 2 types, bacilliformis and verrugiformis; they are parasites of human red blood and histiocytic cells. The bacilliformis type produces 2 stages of the disease, a febrile acute hemolytic anemia known popularly as "Oroya Fever," later followed by skin eruptions known as "Verruga Peruana." The verrugiformis type produces only the verrucose stage. Today antibiotics stop the parasitism, but there were no antibiotics then. After infection is a sudden fever, chills and bone pains. Acute anemia and jaundice are observed in the sick. The verrucose stage appears much later, usually several months to a year or more. During this period the eruptions may look like measles, or smallpox, or larger nodules, in the form of hazel-nuts, which the Spaniards so vividly described as they probably came down with the sickness in the 1530s. The verriformis type has less pronounced eruptions, more in the form of measles and may occur a second time during ones life. If one survived one was a lifetime carrier. Our knowledge of the disease was advanced in the 1870s, when workers on the RR from Lima to Oroya were infected and died in large numbers. In 1885 Peruvian medical student Daniel Carrión self-inoculated with verruga, contracted Oroya fever and died, demonstrating the link. H. Noguchi and T. Battistine (1926) proved the two were simply manifestations of the same disease. [Based on Oscar Urteaga-Ballón, in Kiple, Cambridge World History of Human Disease who has worked on inoculation to prevent contraction of the disease.] Certainly Huayna Capac could have died of bartonellosis. The Spanish as they marched along the coast of Ecuador seemed highly susceptible, and many were described as having the large wart-like nut sized growths. Some described vividly their bloody attempts to cut them out. Huayna Capac in his conquests did travel in regions in which bartonellosis was endemic. The case of infection and his death, and the deaths of some who traveled with him would suggest this as a potential candidate. But there is a problem. There was an epidemic at the time, I think we all agree on this. Let me quote Pedro de Cieza de León, whose source were the quipucamayos the orejones viejos of Cuzco, around 1550. "Quentan que vino una gran pestilencia de viruelas tan contagiosa que murieron más de 200,000 ánimas en todas las comarcas, porque fue general [Crónica, segunda parte, Lima: PUCP, 1985, 199-200, PS: Cieza believed Huayna Capac was buried in Cuzco, 201]." The substantial number of those who died were spread throughout the highlands, to Cuzco, which is not a natural habitat for *Phlebotomus verrucarum*. A generalized epidemic of Carrion's disease would require the insect transmitter to be present. You may wish for a deus ex machina, perhaps in the case of a niño effect that might spread the range of the insect by higher temperatures and humidity. But correct dating of niños is about as imprecise as dating the death of mummies extracted from Peruvian cemeteries. Give or take a decade is not good enough. Furthermore, there is a Quechua terminology for the disease which surely should have been used had they known the disease at the time. As we note in the critique of the McCaa et al piece, Domingo de Santo Tomas provides the Quechua words for "berruga, o peca de la cara" -- moro, ticti o rimpicota. When you check the Quechua rimpicota you discover it also means barro, o berruga! Barro means not only mud, but also pimple! Moroyani,gui means nacer [appear] berrugas. Moro çapa, o rimpicota means berrugoso. If Huayna Capac had died of verrugas why would not one of the native informants have used one of these terms instead of using caracha [scabs]?

Cook's conclusion: The evidence is not strong enough for me to change my position that smallpox was the cause of the death of Huayna Capac, but I do admit the possibility that it "might have been

bartonellosis," but not "probably" as Kiracofe posits, and will so mention in any future revision of Born to Die.

Critique of the Acuña-Soto paper:

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The paper, prepared by a medical specialist, is quite well done, and is based on good research. The findings, as developed in the original paper, cover a vast spatial and chronological area. I have one suggestion regarding what seems to me to be a too quick identification of various epidemics with what was called cocoliztli.

Premise 1. "Approximately 60-70% of the death toll registered during the sixteenth century was caused by a series of epidemics of hemorrhagic fevers of unknown origin, the disease was called 'cocoliztli'."

Contra 1. There has been long dispute of the correct identification of the illness labeled by the Nahuatl as 'cocoliztli'. The level of mortality was frightening, and given the symptoms provided in the texts hemorrhagic fevers were present. Acuña-Soto has presented 10 epidemic series between 1536 and 1601. Some of these 10 epidemics have been identified as specific diseases, or combinations of diseases in the form of an epidemic series, by various specialists: Elsa Malvido, Hanns Prem, and many others. I especially urge the author to look at the arguments presented by Prem in a chapter of Secret Judgments of God... [Cook and Lovell, eds.]. The problem with my copy of the presentation is that there is not a systematic discussion of the sources and the variations in the sources which is necessary, unless we assume the 16th century accounts are invalid and take only the returns, and I don't think you would wish to go that far.

Slide 5 for example seems to go with the 1545 series, and your mention of some symptoms could lead someone to suggest bubonic plague... which includes all your symptoms.

Your use of the term Cocoliztli seems to be generic, that is any terrifying sickness with hemorrhagic fevers was labeled as cocoliztli. In your discussion of the series that began in 1576 you need to at least consider the use of the word tabardillo by Mendieta, a Spanish term for typhus. When typhus explodes you can get the high rates of mortality that you see here.

The link between disease outbreaks and climate, nourishment, and human population densities, is well established, here as elsewhere. The question of a hantavirus is intriguing, but I believe we need a more substantial proof, and the proof may be very difficult to establish.

Critique of the Livi-Bacci paper: [Professor Livi-Bacci of the University of Florence was unable to attend the meeting. His short paper is the first to address the question raised in my 2002 and 2003 articles, that is Taino deaths from smallpox in 1493].

.....
Premise 1. "Some writers have made the hypothesis of an earlier arrival of the infection at Hispaniola, but no documentary evidence survives."

Contra 1. Of the works Livi-Bacci cites, no one specifically mentions smallpox prior to

1518. I recently did, in two articles: "Sickness, Starvation, and Death in Early Hispaniola," Journal of Interdisciplinary History 32:3: 349-86, and in "Una primera epidemia de viruela en 1493?," Revista de Indias 63:227: 49-64. In these articles documentary evidence is presented that disease did exist on Hispaniola before 1518. Especially important is the fact that evidence *does exist* that in 1493 the Indian translators from Hispaniola taken by Columbus were infected with smallpox at the time of their leaving the port of Cadiz on their return to Hispaniola and all but two died.

Premise 2. "other factors (including a lowered fertility) were depressing the demography of the island. In short, one does not need to postulate the recurrent action of epidemics and mortality crises as the *exclusive explanatory factor* of the precipitous decline of the island's population."

Contra 2. I am unaware of anyone who has argued that epidemics were the "*exclusive explanatory factor*", on the contrary, the multifactorial approach is favored by even those who press the epidemic argument. The issue is then the relative weight of the factors, and here the positions are sharply different. At present I know of no valid way to quantify the relative weights for the causes of Amerindian mortality in the contact era.

Premise 3. Livi-Bacci quotes my 1998 text that: "Each subsequent ship and fleet brought from Southern Spain new settlers, animals, plants, and obviously pathogens. To argue that illness was not transported is to assume the high[sic] improbable" (Cook 1998: 230). Livi-Bacci says "Maybe *not so improbable*, at least for smallpox."

Contra 3. Livi-Bacci's exercise in probability is interesting, but historical events often occur before their time. He studies the number of ships going to the Indies before 1518, similar to my '98 analysis. In sum he estimates 20,000 Old World peoples set foot on Hispaniola between 1492 and 1518, therefore it is possible disease was introduced, but what is the "probability"? He calculates a 2 percent probability per year that someone infected with smallpox would board a ship to the Indies. It would therefore take 50 years [1542] before it was probable that smallpox was introduced to America. That it came in 26 years [1518] was bad luck he says. I say that smallpox could possibly have reached America in 1493, which would make it even unluckier!

Premise 4. Each person boarding for the Indies was an adult.

Contra 4. I'm uncertain why he made this assumption, for it is certainly incorrect. On board each fleet were apprentices and pages or cabin boys, some [and we cannot know the percentage] who had not experienced smallpox, and were therefore susceptible during an outbreak.

Premise 5. Implicit, that smallpox is spread only by direct person to person contact, when the carrier is infectious.

Contra 5. Actually, as Dixon and other specialists have documented either by historical evidence or laboratory experiments when smallpox was testable, the virus can be stored and transported in a variety of ways. Packing in bundles of cloth is one way to spread the virus. Note one surviving Taino who had returned with Columbus from Spain took gifts of

clothing when he returned to his village in late 1493.

Premise 6. People with active smallpox would not be permitted to board a ship for the Indies.

Contra 6. This is a supposition. When you examine carefully quarantine practices in Andalusia you note that the only epidemic disease that consistently resulted in quarantine was the plague. Note smallpox was known at the time as a “childhood disease.” Most adults were not susceptible, and did not fear infection, although they knew smallpox could be deadly for their children. Furthermore, as we know you can board ship already infected and the symptoms may not appear for 14 days, by which time you are well on the way to the Indies.

Conclusion: Contrary to Livi Bacci, disease was a factor in the demise of the Taino of Hispaniola in the period from 1493-1518, and that there is ample evidence of it. I clearly concur that overwork, exploitation, and warfare also played a role.