Fallen Fontenalle in the American Southwest: Its Origin, Epidemiology, and Possible Organic Causes

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Introduction

Ethnic diversity is highly evident in the American Southwest. This region, encompassing the border states and parts of Colorado, Utah and Nevada, is a cultural mosaic, with peoples adhering to one of three principal cultural traditions: Amerindian, Hispanic, and Euroamerican or "Anglo." Though there has been admixture among these traditions, each remains distinctive with customs and behaviors largely its own ranging from language and diet to the ways in which members of a tradition define and treat sickness. Our concern in this paper is within the Hispanic tradition and one of its unique traits pertaining to disease theory, *caida de mollera* or fallen fontanelle.

Much of the scholarly reporting on Hispanic folk-medicine focuses on what is generally known as "culture-bound syndromes." These are illness states with associated etiologies and therapies unique to members of a given group. In other words they are culture-specific, not pan-cultural as in the case of cosmopolitan or modern medicine. In comparison to other syndromes reported on for Hispanics and Hispanicized Indians (e.g., *susto* or fright sickness [Rubel, O'Nell, and Collado Ardon 1984] and *empacho* or an obstructed stomach [Trotter and Chavira 1981], *caida de mollera* has received relatively little research attention (also see Simons and Hughes 1985). Our purpose here is to elevate current understanding on *caida de mollera* to a level more closely approximating what is known about the other folk-bound syndromes. Specifically, we will address three principal questions: 1) where did the trait of fallen fontanelle originate; 2) what is the epidemiological profile of this syndrome among Spanish speaking people in the American Southwest (e.g., frequency of occurrence, assumed etiologies, and modes of curing); and 3) does Western or cosmopolitan medicine have a direct analog to *caida de mollera?*

The Syndrome of Fallen Fontanelle

In any society the very young are prone to misfortune. Injury, sickness, and death are common risks. Among Hispanics, one threat newborns and infants commonly encounter is *caida de mollera*, a condition, at times fatal, attributed to physical trauma. A fall, accidentally being dropped, a severe spanking, suddenly withdrawing the nipple while nursing, or any form of rough handling can disrupt, it is believed, the child's fontanelle, causing it to drop imperceptibly or to collapse totally. (The anterior fontanelle, or *mollera*, is a membranous interval of incompletely ossified bone at the crown of the skull). The displacement of the fontanelle, whether visually noticeable or not, marks the onset of *caida de mollera*, and those so afflicted are indeed truly sick. There is excessive crying and a reduced desire, even ability, to feed. The eyes of the victim may appear watery and withdrawn. Diarrhea, vomiting, and restlessness are typically common. These and other symptoms may persist for days.

Therapy for fallen fontanelle is directed not so much at eliminating its symptoms, but its ultimate cause. The fontanelle must be returned to its proper position. At times this can be accomplished by pushing upward on the roof of the victim's mouth,

by holding the child upside down and shaking him repeatedly, by patting the bottom of the victim's feet, or by sucking the *mollera* or "soft spot." Occasionally, medicinal teas or a compress will be used. Favorable results, though, are not always obtained. *Caida de mollera* can be a severe, lingering disorder. At times it proves deadly. There is good reason, then, why this syndrome is considered significant among those of Hispanic cultural tradition. Yet, the origins of *caida de mollera* lie not with the Spanish but with the Aztec of pre-Columbian Mexico.

A Question of Origin

In a now classic paper which has been widely cited, Foster (1953) suggests that many traits characterizing contemporary Latin American folk-medicine are ultimately of foreign origin, being brought to the New World by the Spanish. Such traits included the now widespread hot-cold theory of disease, as well as the folk-bound syndromes of *susto*, *mal de ojo*, *empacho* and *caida de mollera*. According to Foster, aboriginal beliefs and practices had less effect on shaping the ethnomedical customs seen in Latin America today than those held by the colonizing Spanish. Unquestionably the Spanish forever changed the face of the New World, but to argue that contemporary Latin American folk-medicine derives mostly from Spanish influence is misleading. In the case of fallen fontanelle, such an interpretation is wrong.

If in fact the Spanish did introduce the trait of fallen fontanelle to the Americas, then one would logically expect to find three things: 1) reference to this syndrome in the medical texts available to the Spanish during the 16th century; 2) the presence of *caida de mollera*, or even a survival or parallel of it, in the ethnomedical traditions of Spain today; and 3) a fairly even distribution of the trait throughout contemporary Latin America. Though we must limit our discussion here, it is truly interesting to note that none of three "areas of proof" can be substantiated.

In his 1953 paper (and in subsequent works), Foster gives no European counterpart to *caida de mollera*, nor does he cite any reference for its occurrence anywhere in the Old World. We asked three noted medical historians highly familiar with European folk-medicine if they had ever encountered reference to this trait in the materials they had researched, and each said no (Majno, pers. com., 1983; Moss, pers. com., 1983; Risse, pers. com., 1984).

Foster and other writers (e.g., Kay 1977, 1979) are of the opinion that the work and teachings of Juan de Esteyneffer, a Spanish Jesuit missionary who lived in Mexico during the early 1700s, served importantly to shape ethnomedical custom today among rural Mexicans and U.S. Hispanics. Though Esteyneffer's *Florilegio medicinal*, written in 1712, does contain a detailed account of *caida de mollera* (Anzures 1978, vol. 1:441), there is still no reason to believe this syndrome is Old World in origin. Carmen Anzures, the editor of the most recent edition of *Florilegio medicinal* (1978, vol. 1:34, 67), lists the medical sources of the day that Esteyneffer most likely drew upon or consulted as: Hippocrates, Galen, Boerhaave, Sydenham and possibly Farfan. A search of the index for the complete works of Hippocrates (Littre 1846) reveals no reference to fallen fontanelle or to its treatment. Nothing on this syndrome appears in Sydenham (Latham 1848). While Boerhaave (1755:68) mentions "skull depressions," his account pertains only to the treatment of head wounds and fractures. What, then, was the source of information for Esteyneffer's description of *caida de mollera?* Surely it was not European.

Interestingly, popular health culture in Spain today is decidedly unlike that seen in Latin America (Press 1973). Many traits that characterize ethnomedicine in the Americas today are of little significance in Spain (e.g., the hot-cold theory of disease Foster 1953). Other traits are totally absent in Spain, as is the case for *caida de mollera*. When Pitt-Rivers describes evil-eye and evil-winds in his ethnography of the Spanish town of Alcala de la Sierra (1969:198), there is no reference to the harmful effects of fallen fontanelle. Foster himself (1953:210) discusses illnesses in Spanish popular health culture that result from body parts being displaced from their normal position—*espinela* (bones in the pit of the stomach), *paletilla* (bones between the shoulder blades), and *calleiro* (a fallen stomach) —but why is fallen fontanelle missing if it originated in Spain? And if this trait had been brought by the Spanish to the New World, then one can rightfully expect to see its presence throughout Latin America, from Mexico southward to Peru and Chile.

The geographic distribution of *caida de mollera* is indeed revealing, but not supportive of a theory

based on introduction. A recent article on Spanish survivals in the folk-medicine of Chile contains nothing on *caida de mollera* (Alvarez et al. 1983). Valdizan and Maldonado's (1922) extensive overview of ethnomedicine in Peru has detailed materials on both evil-eye and fright-sickness, but nothing on *caida de mollera*. The work of Hubi (1954) and others confirms the same finding, fallen fontanelle is not a feature of popular health culture in the Andean region. But it is precisely here, according to Foster (1953:215), that Spanish survivals in folk-medicine are most clearly seen. And if this is in fact the case, would not fallen fontanelle be more common here than elsewhere in Latin America? And why did Esteyneffer's teachings on *caida de mollera* fail to pass from Spaniard to Indian, when a copy of his works was housed at the University of San Pablo de Lima in the 1700s (Valdizan and Maldonado 1922, vol 3:69)? And finally, why is the trait of fallen fontanelle so evident in Mesoamerica? The answer, of course, is that it was aboriginal to Mexico.

In the world view of pre-contact Mesoamerican peoples there was the belief that life-giving forces resided in most everything both animate and inanimate. Each and every person possessed several inner forces. Among the Aztec one of these forces was known as *tonalli* (see Lopez Austin 1980). This inner force imparted warmth, vigor, and courage. It was *tonalli*, too, that favored children with growth. While found throughout one's body, the principal abode for *tonalli* was the head. Its loss, either by fright or physical violence (Molina 1970), would provoke grave illness, even death, and children were at great risk, not surprisingly, because their fontanelles had not fully closed (Lopez Austin 1980, vol. 1:224). Torquemada, writing shortly after the conquest, states that the Aztec believed that parents should not cut a child's "long hair at the back of the head" (1943, vol. 2:84), for this would be equivalent to opening a dangerous door through which the *tonalli* would escape (also see Lopez Austin 1967). There are many other 16th century sources that contain reference to Aztec therapies directed at the fontanelle, the hair, or the head generally (Hernandez 1959, vol. 2:147; Ponce de Leon 1965; Ruiz de Alarcon 1953:140–141).

The Aztec diagnosed the loss of *tonalli* by feeling the patient's pulse and by observing the condition of the *mollera* (Ponce de Leon 1965:131). Diagnosis was also established through divination, either by looking at the child's reflection in a vessel of water or by "reading" grains of corn that had been cast into water. Accompanying such divination the healer frequently employed an incantation: ". . . let us look here at the poor child, he whom his venerable *tonalli* perhaps has abandoned . . ." (Ruiz de Alarcon 1953:137). At times the *tetonalmacanime*, or in the words of Ponce de Leon (1965:125)—"those who give *tonalli* to people"—would treat afflicted children by lifting the hair on their fontanelle then ask the sun to return their wandering *tonalli*. A line was drawn on the patient's face from nose to the middle of the skull with juice from tobacco or *tlacopatli (Aristolochia mexicana)*, the latter having a special power to attract *tonalli* (Hernandez 1959, vol. 2:130–131; Lopez Austin 1980, vol. 1:240–241). This rite closed the opening through which this vital force had earlier escaped (Lopez Austin 1967:108).

Though Spanish chronicles of Aztec life and culture unquestionably colored, to varying degrees, the content of Indian reporting on native ways, one cannot ignore the symbolic importance of the head, more specifically the hair, in the aboriginal world view prior to contact. In literally thousands of scenes—on pottery, on murals, on wood, on stone—there is a standard sign symbolizing defeat, or the taking of an enemy—a captive being grasped by the hair. The *tonalli* of the vanquished was thus under another's control. For the Aztec, hair was viewed as a protective layer that impeded the loss of this vital force, and, as noted by Lopez Austin (1967), should the hair on one's *coronilla* (crown) be cut, the subject would soon die. It seems, then, that *tonalli*, hair, and the fontanelle were symbolically intertwined, both in the context of good fortune and bad.

Additional and persuasive evidence that *caida de mollera* was a recognized illness category among the Aztec appears in Sahagun's *Primeros memoriales*, one of the earliest works he collected in Nahuatl. Here he describes the "*teapahtiani*," a healer specializing in the treatment of fontanelle (Lopez Austin 1980, vol. 1:250):

> The TEAHPAHTIANI thus cures little children: she hangs him upside down, she shakes his head from one side to the other and she pushes on his palate. Some of them attract (the spirit) with their breath.—and also push the child's palate with cotton which they stuff in. Some get well with this, others don't. This resembles the method in which they puncture (the palates) of little children, from which they

> soon die—or they rub them with salt or they press repeatedly *(papachoa)* the little children with tomato. [Garibay 1943]

The treatments appearing in this passage closely parallel the pattern of therapy found today. Pushing up on the palate, for example, is the favorite remedy among those we interviewed in Texas (N = 80). Many also treat the victim by holding him upside-down or by patting the soles of the feet. These and other contemporary practices in the treatment of *caida de mollera* can be traced back to the Aztec, but not to Esteyneffer who wrote the following:

> If the fontanelle of the child is fallen, the mother should put breast milk in the fontanelle itself and she will see it visibly rise. Or put the child's head into a vessel of lukewarm water to the depth of the nose, but don't let water get into the nose, and lift out suddenly repeating it several times with which the water will suck the fontanelle out. After this treatment, put a plaster on the fontanelle made out of incense powder . . . or from 'copal', made into a paste with a good bit of beaten egg white and placed on a cloth. It should be applied lukewarm. [Esteyneffer 1978, vol. 1:441]

It should be stressed that the treatments noted by Esteyneffer are not the predominant treatments used today in any region where *caida de mollera* is found. Incense and copal poultices are not cited at all. Dipping the child's head in water was mentioned, for example, by only 2% of our eighty informants and only 5% thought that an egg poultice was an appropriate remedy. This is not what one would expect if Esteyneffer were the sole or primary source of information shaping contemporary Mexican and Mexican-American folk medicine. To the contrary, most of the remedies people use today for treating fallen fontanelle also appear in Aztec ethnohistoric literature.

The evidence at hand clearly points to Mesoamerica as the locale from which *caida de mollera* emerged. Syncretism between Aztec and Spanish cultures was pronounced in the early colonial period, and no doubt the native view regarding *tonalli* meshed well with European illness categories based on assumed displacement of body parts. Though the concept of *tonalli* was most likely replaced by the Christian idea of soul, there has been remarkable continuity from Aztec times to the present regarding the fontanelle as a locus of disease, and how the afflicted could be cured. Hispanics in the American Southwest are the heirs of a long and interesting cultural history, one where *caida de mollera* owes much to the aboriginal peoples of Mexico.

An Epidemiological Profile

Despite pronounced variation in acculturation towards an "Anglo" lifestyle (see Cuellar, Harris, and Jasso 1980), many Hispanics in the American Southwest recognize fallen fontanelle as a common, potentially serious threat to newborns and infants. Because this syndrome lies, at least in popular opinion, beyond the realm of modern medicine, parents rarely report it to physicians or other health care personnel. To the contrary, diagnosis and treatment occur almost exclusively within the home. However, a stricken child might be gravely ill, with death as a possible outcome. There is a very real discrepancy resulting from the syndrome's biophysical manifestations and its ethnomedical etiology and cure that places many children at considerable risk. Parents frequently postpone, or more commonly never seek, biomedical consultation for a child with *caida de mollera*. Because of this there is a need to improve current understanding among health professionals concerning the ubiquity of this syndrome, and how it is perceived and treated in the context of the home. Similarly, parents must be encouraged to report cases of *caida de mollera* to physicians. The syndrome of fallen fontanelle is biomedically real and too frequent for parents to ignore physicians and vice versa.

Our data on the occurrence and treatment of *caida de mollera* were collected from two sample populations. The first data set was generated by interviewing Hispanic patients at 31 migrant and/or Public Health clinics in Texas, New Mexico, and Arizona. Informants were chosen at random during a period of one week. Interviews were conducted by bilingual interviewers in the language preferred by the informant. The survey instrument contained 18 questions, seven demographic in nature (age, sex, household composition, occupation, etc.) and the rest on folk medical concepts. These questions included, for example, whether or not anyone in the household had been treated for *caida de mollera*, and if so, by whom and when. There was also an open ended question on knowledge of remedies for *caida de mollera*. While the patients interviewed at

these clinics may not be completely representative of the total Hispanic population in the three states, our sample none the less contains a wide cross-section of individuals in terms of age, family composition, education, occupation, and degree of acculturation (see Trotter 1985a,b). Moreover, the sample is large (N = 1900) and thus provides a sense of confidence that these date approximate the beliefs of low-income Spanish-speaking people throughout the Southwestern United States.

The second data set was collected from a purposive sample of 80 individuals. No attempt was made to randomize the sample. In fact, only individuals who were known to have treated *caida de mollera* were interviewed since the purpose was to explore the overall parameters of the treatment of this syndrome rather than its epidemiologic occurrence. These individuals all resided within the lower Rio Grande Valley of Texas. They ranged in age from 18 to 64; 92% are female; all are Mexican American. The estimated socio-economic status of these informants ranged from very poor to upper middle class with the preponderance of the informants coming from households headed by semi-skilled and skilled laborers. The data collected from this purposive sample were used to identify major patterns in the symptomology and treatment of *caida de mollera*.

Several important findings emerge from these two data sets. First, *caida de mollera* is fairly common among Hispanics in the Southwest. As can be seen from the data in Table 1, 28.3% of the 1,900 patients interviewed had treated someone in their household for *caida de mollera* at some time in the past. The percent treated varies by geographic location, as would be expected. Under-reporting—a reluctance to admit to interviewers that a family member had been treated—probably accounts for much of the variation from clinic to clinic as well as for any unusually low rates. Differential acculturation is another possibility for such variation. The range is from a low of 2.7% in Presidio, Texas to a high of 69.6% in Tucson, Arizona. Perhaps more significantly, 15 of the 31 clinics had patient pools with a treatment range (for fallen fontanelle) between 25% and 50%. Except for a few locations (El Paso and Presidio), the occurrence of this illness appears fairly common across our sample. These findings are basically in line with what other researchers have reported. Granger (1976) notes that 95% of his informants in Dallas had either, as a child, suffered from or, as a parent, had treated a son or daughter for *caida de mollera*. Holland (1978) found that 33% of his informants in Arizona had treated a family member for fallen fontanelle, and 55% felt that this syndrome is a serious risk to children. In their study of *curanderismo* in Taos County, New Mexico, Scheper-Hughes and Stewart (1983) show that the most frequent complaint presented to folk healers (*curanderos*) is *caida de mollera*. Martinez (1966) reports that 97% of the Mexican-American women he interviewed claimed knowledge of the concept of fallen fontanelle and 33% cited precise remedies for its treatment. Finally, other studies (e.g., Casillas 1978; Clark 1970; Hurtado Vega 1979; Knoke 1984) reveal that fallen fontanelle is a fairly ubiquitous health problem in Hispanic populations in general.

Unlike the cause of *caida de mollera*, a subject upon which there is wide agreement among informants, beliefs regarding the signs of fallen fontanelle, and how best to treat this condition, are highly variable. However, certain patterns predominate within this variability. Our second research population, one consisting of 80 informants, was used to generate data on symptoms and treatments of *caida de mollera*. Considerable variability was encountered. For example, a total of 27 symptoms were identified by individuals in this population, as shown in Table 2. Certain symptoms, though, appear to be idiosyncratic. Chills, constipation, inflammation of gums, heavy perspiration, and weight loss were cited only once as signs of fallen fontanelle. These symptoms are unique, then, to given individuals. At the other extreme are symptoms that exhibit greater consensus among informants. Rather than being idiosyncratic or unique, these symptoms are group or collective phenomena, thus reflecting the general or modal pattern fallen fontanelle usually takes. The symptom most frequently mentioned by our informants, and several gave multiple responses, is diarrheal complaint (53.7%). This was followed by excessive crying (43.7%), fever (36.2%), loss of appetite (30.0%), restlessness or irritability (25.0%), and watery eyes (22.5%). Another 21 symptoms, ranging from inability to nurse and vomiting (20.0% and 17.5%, respectively) to a bloated stomach (2.5%) were mentioned by informants. Most of those interviewed, however, described a cluster of symptoms for *caida de mollera*, the largest being 8, the mode 3, and a minimum cluster of two symptoms. Approximately two-thirds of the informants presented symptom clusters (these will be discussed in the

Table 1.
Percent of Sample Treating Caida De Mollera in Three States

Location	% Treating Caida de Mollera	Number of Patients Interviewed
Arizona		
1. Tucson	69.6	46
2. Somerton	16.3	49
Combined	42.1	95
New Mexico		
3. Portales	29.0	31
4. Albuquerque	24.6	126
5. San Miguel	19.4	32
6. Sunland Park	15.2	37
7. Anthony	11.8	34
Combined	21.1	260
Texas		
8. Bracketville	24.4	41
9. Eagle Pass	27.0	79
10. Hereford	33.0	13
11. Floydada	46.7	37
12. Crosbyton	45.9	41
13. Plainview	25.3	99
14. Goldwaite	21.7	48
15. Gonzales	31.3	48
16. El Paso	3.1	96
17. Muleshoe	35.7	43
18. Dimmitt	37.5	46
19. De Leon	18.4	40
20. San Saba	19.0	28
21. Levelland	44.6	101
22. San Angelo	61.2	50
23. Laredo	19.3	215
24. Olton	28.6	29
25. Odessa	64.0	50
26. Littlefield	39.0	45
27. Crystal City	11.7	99
28. Cotulla	16.2	103
29. Presidio	2.7	39
30. San Antonio	44.1	98
31. Harlingen	39.6	57
Combined	28.6	1,545
Total Sample	28.3	1,900

Table 2.
Symptoms Accompanying Caida De Mollera

Symptoms	Number of Informants Mentioning Symptoms (N = 80)	%
1. diarrhea	43	53.75
2. excessive crying	35	43.75
3. fever	29	36.25
4. loss of appetite	24	30.0
5. restlessness/irritability	20	25.0
6. mucousy, watery eyes	18	22.5
7. inability to grip nipple	16	20.0
8. vomiting	14	17.5
9. change in sound of nursing	10	12.5
10. sunken eyes	9	11.25
11. bump on palate	7	8.7
12. listlessness	7	8.7
13. insomnia	7	8.7
14. pale	7	8.7
15. stomach pains or cramps	5	6.25
16. weakness	4	5.0
17. no pulse or movement in fontanelle	3	3.75
18. dehydrated	3	3.75
19. excessive saliva	2	2.5
20. runny nose	2	2.5
21. bloated, rigid stomach	2	2.5
22. loose jaw	2	2.5
23. chills	1	1.25
24. constipation	1	1.25
25. inflammation of gums	1	1.25
26. heavy perspiration	1	1.25
27. weight loss	1	1.25

next section). Interestingly, an abnormal appearance of the child's fontanelle was mentioned as a symptom by only 3 of the 80 informants. Apparently the fontanelle can be displaced without visible evidence. Positive diagnosis, therefore, is based primarily on the presence of other symptoms and the re-calling of recent, trauamtic events affecting the child.

The etiology of fallen fontanelle invariably involves some type of physical trauma. As such, it surely fits into Foster's (1976) notion of disease resulting from naturalistic forces. Fourteen different

Table 3.
Causes of Caida De Mollera

Cause	Number of Informants Mentioning Cause (N = 80)	%
1. fall to floor	59	
2. pulling nipple out too fast while nursing baby	40	
3. jolting baby	14	17.5
4. throwing baby in air and catching it	14	17.5
5. a hit on head	9	11.25
6. dehydration	6	7.5
7. poor nutrition	5	6.25
8. traveling on bumpy road	2	2.5
9. rocking baby too fast	2	2.5
10. picking baby up suddenly	2	2.5
11. allow baby to suck empty bottle	2	2.5
12. fright	2	2.5
13. don't carry or hold baby properly	2	2.5
14. leave baby's head unwrapped and take out into a fog	2	2.5

causes for *caida de mollera* were noted by the 80 informants, as shown in Table 3. By far the most common cause is "a fall to the floor," being mentioned by 50 informants (73.7% of those interviewed). Next came "pulling the nipple too quickly or forcefully from the infant's mouth" (50.0%), "jolting the baby" (e.g., knocking him over [17.5%]), and "throwing the baby in the air and catching him" (17.5%). Other causes were cited less frequently, for example, a hit on the head (11.2%), dehydration (7.5%), leaving the infant's head unwrapped (2.5%), or allowing him to suck an empty bottle (2.5%). We have no evidence that neglect or abuse is involved. Many of these events occur accidentally during the normal course of child rearing.

Table 4.
Treatments for Caida De Mollera

Treatment	Number of Informants Mentioning Treatment (N = 80)	%
1. push up on palate	53	
2. rub soap into, or fill fontanelle with soap, let dry	28	
3. hold baby upside down by legs, tap on baby's feet	24	
4. hold baby upside down by legs, shake up and down	24	
5. suck on fontanelle, usually with water in mouth while sucking	10	
6. fill fontanelle with egg, let dry	9	
7. give baby a tea	8	10.0
8. pull up on hair on fontanelle	7	8.7
9. hold upside down, dip head in water	5	6.25
10. put a plaster over fontanelle	2	2.5
11. lay baby down, pat bottom of feet	2	2.5
12. take to doctor		1.25
13. rub fontanelle with boiled egg	1	1.25
14. rub fontanelle	1	1.25

As shown repeatedly by medical anthropologists (and others as well), therapy for an illness is many times an accurate mirror of the illness' assumed etiology (see Foster 1976). This is surely the case for *caida de mollera*. Because this illness results from physical displacement of the fontanelle (whether seen or not), most treatments, therefore, attempt to restore the fontanelle to its proper position by physical means. The range of cures seen among our 80 informants surely reflects this point, as shown in Table 4. Of the 14 different treatments

mentioned, all but two are purely mechanical in nature, the exceptions being use of a medicinal tea (only 8 informants prescribed this) and taking the stricken child to a doctor (only 1 informant out of 80 said this would be appropriate). The most common treatment, one employed by 53 of the 80 informants (66.2%), is to push the child's palate upward with one's fingers. Rubbing wet soap over the child's fontanelle, then allowing the soap to dry (thus pulling up the fontanelle), is also quite common (35.0%). The next most frequently mentioned strategy is to hold the child upside down by the legs and then either tap repeatedly on the feet or shake the patient up and down (68% of the informants cited these as effective cures). Other treatments, though, enjoy less currency: sucking on the fontanelle (12.5%); allowing a cracked egg to dry on the fontanelle (11.2%); pulling the hair that covers the fontanelle (8.7%); and dipping the child's heat into water, something prescribed by Esteyneffer (6%). The remaining strategies to cure *caida de mollera* are idiosyncratic variations of the more common therapeutic procedures cited above. Interestingly, most of the remedies cited by our informants are ones that appear in various Aztec sources. Again, it appears that Esteyneffer had little impact on contemporary treatment patterns for fallen fontanelle.

The most significant finding about how patients (or *curanderos*) attempt to cure a child of *caida de mollera* is that virtually all of the procedures are mechanical in nature (save for medicinal teas and taking the afflicted to a doctor), thus the highly evident biophysical complaints associated with this syndrome pass, in effect, untreated, as do the syndrome's actual underlying causes. In short, then, folk therapy in this case is overwhelmingly ineffective, a situation that undoubtedly gives rise to the known seriousness of *caida de mollera*.

It seems relevant here to briefly re-state three points about the data we have presented thus far. First, the syndrome is not a rare or unusual trait among Hispanics. Rather, this illness is relatively common, perhaps affecting more than a third of all low-income Spanish-speaking families at one time or another. The estimate of one-third is based on the mean of our reported cases. Second, pronounced variability characterizes popular opinion regarding the symptoms of, and the appropriate means for curing, fallen fontanelle. Yet the etiology and therapeutic procedures associated with this syndrome reflect a single theme, physical displacement-physical restoration. Third, there is a significant discrepancy between the ineffectiveness of folk remedies and the biomedical realities of *caida de mollera* (diarrhea, crying, fever, etc). This discrepancy obviously jeopardizes the well-being of many victims. Therefore, the following question must be asked: is there an analog in Western medical nosology that can account for the symptoms typically associated with fallen fontanelle? It is to this question that we now turn.

Western Diagnosis of Fallen Fontanelle

As noted previously, victims of *caida de mollera* typically exhibit several symptoms simultaneously. While the total range of symptoms associated with this condition is large, certain symptom clusters clearly predominate. The most common of these, judging from our sample of 80 informants, is one that encompasses diarrheal complaint, excessive crying, fever, and loss of appetite. Some informants presented a modified or expanded version of this cluster, making reference to the child's inability to nurse or bottle-feed, his irritability, and watery or sunken eyes.

It seems, then, that a majority of victims of fallen fontanelle display a recurrent set of symptoms, where both biological signs (i.e., diarrhea, fever, occasional vomiting, etc.) and behavioral changes (i.e., abnormal feeding habits, poor composure) collectively spell the need for therapeutic action. The label of "*caida de mollera*," we should add, is ascribed to these and related symptoms if, and only if, some physically traumatic event involving the patient had occurred prior to the onset of sickness. When trauma is absent, the same symptoms would be glossed with another illness term, for example, colic. What is so important to remember, however, is that unlike the remedies for most other illness categories, those prescribed for fallen fontanelle are virtually all mechanical in nature, as in the case of pushing upwards on the palate. Such procedures, while viewed appropriate in folk medical theory, are totally ineffective in dealing with the organic causes responsible for the highly apparent symptoms of fallen fontanelle.

In an attempt to gain at least a preliminary understanding of the probable organic causes of *caida de mollera*, we asked two area physicians (Edinburg, Texas) to make "blind" diagnoses of three hypothetical patients with differing symptom profiles, profiles based on the symptom frequency data

gained from our sample. Unlike customary practice, the physicians had no knowledge of the patient's family, no opportunity to consult or question parents, no understanding of home conditions, no chance to employ diagnostic tests. They were simply asked, "if an infant displayed these symptoms, what would your diagnosis be?"

The profiles to be diagnosed were constructed with two points in mind. First, they should reflect actual data from our sample. That is, the symptoms selected for the three patients (again, all infants) should be those of relatively high occurrence. Second, the symptoms should exhibit "compatibility." Our analysis of the symptom frequency data revealed, is noted earlier, certain sets of clusters. If, for example, an informant mentioned diarrheal complaint and vomiting, it was very likely that fever and excessive crying would be mentioned as well. Similarly, when inability to nurse was cited, so, too, was a changed sound in nursing. These profiles, then, are consistent with our data in terms of the prevalence of symptoms and the clustering of symptoms. Moreover, they represent variations within what appears to be the typical or model pattern for fallen fontanelle.

Each physician was given a written statement describing the symptom profiles they were to diagnose:

Patient A—diarrhea, loss of appetite, fever, restless/irritable, excessive crying, occasional vomiting

Patient B—mucousy or watery eyes, inability to grip nipple, changed sound of nursing, excessive crying, restless/irritable;

Patient C—sunken eyes, diarrhea, inability to nurse, changed sound of nursing.

The physicians stressed, understandably, that their diagnostic opinions should be viewed as guarded, not conclusive. Nonetheless, they were unanimous in what they thought was wrong with each of the patients. Both remarked, as well, that patient B was the most difficult to assess. This aside, each felt that the symptoms present for patient B would suggest a general systemic infection, perhaps coupled by an allergy. Obviously something was affecting the infants breathing, which became particularly difficult when feeding. Neither physician could go beyond this.

Their opinions regarding patients A and C, however, were more precise. And again the physicians were in agreement. For patient A, the symptoms strongly suggest gastroenteritis (evidenced by diarrhea and fever), possibly leading to dehydration and acidosis. Loss of appetite, irritability, and frequent or prolonged crying are behaviors consistent with gastroenteritis and its related effects. The symptoms for patient C also suggest gastroenteritis. Sunken eyes is a sign of possible dehydration.

The picture that emerges, though it is surely preliminary in nature, is one where gastroenteritis, at times coupled with upper respiratory complaint, may lie, in a majority of cases, at the base of this folk-bound syndrome. The relatively common occurrence of fallen fontanelle in low-income Hispanic households may simply, but quite importantly, reflect the high prevalence of these disorders among infants and young children. Here, risk is due to substandard hygienic conditions. This is particularly true if an infant can crawl, is being bottle-fed, or has been placed on a solid diet. Much in the infants' environment favors gastroenteritis.

Parents are highly aware, too, of the potential seriousness of fallen fontanelle. Fifty-eight percent of our informants, for example, reported that *caida de mollera*, if left unchecked, can prove fatal (only 22% considered it non-fatal). This awareness of the syndrome's potential severity results from two things. First, virtually all of the folk remedies for fallen fontanelle are ineffective in combating organic disease. Second, dehydration is probably a critical feature of *caida de mollera*. It would surely be the most likely suspected cause of death in terminal cases. It seems, then, that gastroenteritis is a likely source for many of the symptoms, biological and behavioral, categorized as fallen fontanelle. While other disorders, obviously, cannot be ruled out, the evidence at hand points to gastroenteritis and its related complications as the primary factor.

If we are correct, then several important issues come to light. Most significant among these is that *caida de mollera* represents a serious threat to the well-being of the very young. Furthermore, since treatment of this disorder is confined almost entirely to home remedies, ones generally incapable of beneficial impact, any underlying causes, notably gastroenteritis, dehydration, and upper respiratory complaint, are allowed to run their natural course. It is also important to stress that very few in the Hispanic community feel that physicians can help in cases of *caida de mollera*. In fact, only one of eighty informants considered physicians a viable resource in treating fallen fontanelle, and then only after repeated use of home remedies had failed. Time and again informants gave antecdotal materials to illustrate that physicians not only misunder-

stood the true nature of *caida de mollera*, they virtually deny its existence. But this syndrome does involve organic disease and most every case goes untreated biomedically. The issue, then, is how best to sensitize parents, as well as physicians, about the real need to have victims of fallen fontanelle diagnosed and treated by a medical doctor. The task of accomplishing this, however, will prove difficult.

Perhaps the best place to begin is with improved communication about the realities of *caida de mollera*. To reach members of the Hispanic community, various state, civil, and private organizations (e.g., schools, churches, public clinics, community action groups) should be informed through mailed information and guest speakers about the potential risks associated with this folk-bound syndrome. In turn, these organizations, through counseling, lectures, handouts, and other means (cf., Takeshita 1966), could inform Spanish-speaking parents about the probable biological parameters and potential outcome of fallen fontanelle, as well as the need to seek medical attention.

Those in the health care profession, of course, must also become more fully informed about this syndrome, its relatively common occurrence, its biological features, its near exclusive treatment in the home. Avenues to disseminate information include professional journals, meetings of professional associations, local newspapers, flyers mailed to public clinics and emergency units, etc. The point here is to encourage physicians to talk openly with parents about this and other folk bound syndromes, so that when a case does occur parents will be more likely to seek clinical aid. To date, though, very little on *caida de mollera* has reached the medical community. There is one report (Guarnaschelli, Lee, and Pitts 1972) that has linked subdural hematomas to folk treatments of fallen fontanelle. Other than this, little is known about its probable organic dimensions, its prevalence, or its potential severity. With improved communication, however, this problem can be effectively reduced.

Conclusion

Like many regions worldwide the American southwest exhibits a diverse array of cultural traditions. The disease concept examined in this paper is unique to the Mexican-American subculture. Our purpose here has been to clarify the historical origins of *caida de mollera*, to discuss its categorization as a folk-bound syndrome, and to explore its probable underlying organic causes. Though much in this article is preliminary, it should serve as a call for additional research. There is a strong need for greater data on the actual outcomes of cases involving fallen fontanelle. Similarly, an improved clarification of the syndrome's organic parameters is another important need. While anthropologists can work effectively within the Hispanic community, encouraging its members to seek medical help when treating *caida de mollera*, we can anticipate less success when addressing the medical community. Headway here will be closely measured by the depth and rigor of future studies of illness categories lying beyond the Western medical model. *Caida de mollera* is truly a case in point, one showing the need to improve cross-cultural understanding in settings such as the American southwest.

REFERENCES CITED

Alvarez, M.L., M.T. Araneda, E. Figueroa, and S. Osorio
1983 Tratamiento de enfermedades en una población rural: Vigencia de elementos hispanicos?. Social Science and Medicine 17:471–474.

Anzures, M.C., ed.
1978 Florilegio medicinal, by Juan de Esteyneffer. México: Academia Nacional de Medicina (orig. 1712).

Boerhaave, H.
1755 Aphorisms. London: W. Innys, J. Richardson, C. Hitch and L. Harves (orig. 1709).

Casillas, L.E.
1978 El uso de recursos médicos en el hogar: Estudio de familias urbanas y suburbanas en la ciudad de México. *In* Estudios sobre etnobotánica y antropología médica, vol. 3. C. Viesca, ed. Pp. 95–114. México: IMEPLAM.

Clark, M.
1970 Health in the Mexican-American Culture. Berkeley: University of California Press.

Cuellar, I., L.C. Harris, and R. Jasso
1980 An Acculturation Scale for Mexican American Normal and Clinical Populations. Hispanic Journal of Behavioral Sciences 2:199–217.

Foster, G.M.
1953 Relationship Between Spanish and Spanish-American Folk Medicine. Journal of American Folklore 66:201–217.

Foster, G.M.
1976 Disease Etiologies in Non-western Medical Systems. American Anthropologist 78:773–782.

Garibay, A.M.
1943 Paralipomenos de Sahagún. Tlalocan 2(3):135–254. (orig. 1558).

Granger, B.H.
1976 Some Aspects of Folk Medicine Among Spanish-Speaking People in Southern Arizona. *In* American Folk Medicine. W.D. Hand, ed. Pp. 191–202. Berkeley: University of California Press.

Guarnaschelli, J., J. Lee, and F.W. Pitts
1972 "Fallen Fontanelle" (Caida De Mollera): A Variant of the Battered Child Syndrome. Journal of the American Medical Association 222(12):1545–1546.

Hernandez, F.
1959 Historia natural de la Nueva España. México: Universidad Nacional de México. (orig. 1571–76).

Holland, W.R.
1978 Mexican American Medical Beliefs: Science or Magic?, *In* Hispanic Culture and Health Care. R.A. Martinez, ed. Pp. 99–119. St. Louis: C.V. Mosby.

Hubi, M.
1954 Algunas observaciónes sobre folklore médico del Departamento de Junin. Perú Indígena 13:70–90.

Hurtado Vega, J.J.
1979 La "mollera caida" una subcategoría cognitiva de las enfermedades producidas por la ruptura del equilibrio mecánico del cuerpo. Boletín Bibliográfico de la Antropología Mexicana. 41 (50):139–148.

Kay, M.A.
1977 The *Florilegio Medicinal:* Source of Southwest Ethnomedicine. Ethnohistory 24:251–259.

Kay, M.A.
1979 Lexemic Change and Semantic Shift in Disease Names. Culture, Medicine and Psychiatry 3:73–94.

Latham, R.G., trans. and ed.
1848 The Works of Sydenham. London: The Sydenham Society (orig. 1666).

Littre, E., ed.
1846 Oeuvres Completes d'Hippocrate. Paris: J.B. Balliere.

Lopez Austin, A.
1967 40 clases de magos del mundo náhuatl. Estudios de Cultura Náhuatl (México) 7:87–117.

Lopez Austin, A.
1980 Cuerpo humano e ideología. Las concepciónes de los antigos náhuas. México: National University of Mexico.

Martinez, C., and H.W. Martin
1966 Folk Diseases Among Urban Mexican-Americans. Journal of the American Medical Association 196:147–150.

Molina, F.A. de
1970 Vocabulario en lengua castellana y mexicana. México: Porrua (orig. 1571).

Pitt-Rivers, J.A.
1969 The People of the Sierra. Chicago: University of Chicago Press.

Ponce de Leon, P.
1965 Tratado de los dioses y ritos de la gentilidad. *In* Teogonía e historia de los mexicanos. Tres opusculos del Siglo XVI. A. Garibay, ed. Pp. 121–140. Mexico: Porrua.

Press, I.
1973 Bureaucracy Versus Folk Medicine: Implications from Seville, Spain. Urban Anthropology 2:232–247.

Rubel, A.J., C.W. O'Nell, and R. Collado-Ardon
1984 Susto: A Folk Illness. Berkeley: University of California Press.

Ruiz de Alarcon, H.
1953 Tratado de las supersticiones y costumbres gentilicas que oy viuen entre los indios naturales de esta Nueva España. México: Ediciónes Fuente Cultural (orig. 1629).

Scheper-Hughes, N., and D. Stewart
1983 Curanderismo in Taos County, New Mexico—A Possible Case of Anthropological Romanticism. Western Journal of Medicine 139:875–884.

Simons, R.C., and C.C. Hughes, eds.
The Culture-Bound Syndromes: Folk Illnesses of Psychiatric and Anthropological Interest. Hingham, MA: D. Reidel.

Takeshita, J.Y.
1966 Lessons Learned from Family Planning Studies in Taiwan and Korea. *In* B. Berelson, et al., eds. Family Planning and Population Programs. Chicago: University of Chicago Press.

Torquemada, F.J. de
1943 Los veinte i un libros rituales i monarchía indiana. 3rd ed. México: Editorial Salvador Chavez Hayhoe. 3rd Edition (orig. 1615).

Trotter II, R.T.
1985a Greta and Azarcon?: A Survey of Episodic Lead Poisoning from a Folk Remedy. Human Organization 44:64–72.

Trotter II, R.T.
1985b Folk Medicine in the Southwest: Myths and Medical Facts. Post Graduate Medicine 78(8):167–179.

Trotter II, R.T., and J.A. Chavira
1981 Curanderismo: Mexican American Folk Healing. Athens: University of Georgia Press.

Valdizan, H., and A. Maldonado
1922 La medicina popular peruana. 3 vols. Lima: Imprenta Torrez Aguirre.