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**JOURNAL**

**Vol. 21  
1989-1990**

The Lambda Alpha JOURNAL is published by the Lambda Alpha Anthropology Honors Society at Wichita State University. The LAMBDA ALPHA JOURNAL is partially funded by the Wichita State University Student Government Association.

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Department of Anthropology  
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Creativity in Senior Years: The Case of Jazz  
Trumpeter "Doc" Cheatham

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In 1953 psychologist Harvey Lehman published the book Age and Achievement which made the claim that creativity and productivity reach a peak in one's thirties and forties and then steadily decline in later years. These conclusions were based on his studies of the lifetime productivity of eminent artists, composers, scientists and authors. The research gave credibility to the time-honored myth, accepted by the general public and perpetuated by the mass media, that adults in their later years must steadily lose their powers to learn, to produce and to create--leaving them only the choice of being bystanders and onlookers while young people participate in innovative and meaningful activities. Much of the substance of this myth can be traced to a misunderstanding of senescence, that is to say, the normal process of aging involving a gradual reduction of corporal functions during middle and old age. It has been well documented, for example, that the average individual experiences an 8 per cent reduction in brain size, a 10 per cent loss in nerve conduction velocity, a 30 per cent decrease in at-rest cardiac output, and a 57 per cent loss in breathing capacity between the ages of 35 and 75. But - do these normal and expected decrements in physiological functioning necessarily mean that there will be an attendant decline in intellectual functioning, particularly in the area of divergent or creative thinking? I think not.

Wayne Dennis, in a 1966 article titled "Creative productivity Between the Ages of 20 and 80 Years," maintains that a major shortcoming of the Harvey Lehman study is the fact that most of the people in Lehman's sample died when they were fairly young, and this produced a bias in favor of an early peak of productivity. And Irving Lorge (1963) believes that aging artists and scholars do not necessarily experience a decline in creativity, but there may be changes in performance due to changes in speed, sensory acuity, self-conception, shifts in values, motivation, goals or special responsibilities that may be associated with aging.

It should also be pointed out that Harvey Lehman's

study of achievement is more a study of productivity than of creativity, and the matter of quantity versus quality is a bit of a clouded issue. Lehman has tallied how many books, musical compositions or scientific discoveries are credited to individuals at various periods of their careers, and since most of his subjects were eminent men, we can assume quality, but we are not entirely certain from his study about the relative quality of creativity at the various periods. While the quantity of production may decline it may very well be that the quality would move steadily upward with the greater experience, skill and knowledge of the creative artist. Creativity, however, cannot be entirely divorced from productivity. In many cases our more creative artists have also continued to be extremely productive into old age. Picasso produced a total of 167 paintings in his 88th and 89th years of life. Senescence, can of course, take its toll on energy levels and therefore the time an individual is able to devote to production may decline, but it is quite reasonable to ask whether or not that will necessarily affect the quality of that diminished production.

In spite of the Lehman conclusions, there is abundant evidence that old age is not necessarily accompanied by a decline in creative or divergent thinking. The list of "old dogs" responsible for new and imaginative tricks includes Benjamin Franklin, who at the age of 80 invented bifocals (because of his annoyance at having to carry two sets of glasses), and the flexible catheter, and who experimented with a treatment for paralysis using electricity. Richard Jordan Gatlin at 82 turned his attention from the manufacturing of weapons of war, the Gatlin Gun, to the development of a motor-driven plow.

Somerset Maugham continued to write and publish quality work until his death at age 92, and P.G. Wodehouse published one of his better comic novels at age 93. At the same age Chagall pledged to "work as long as I have strength," and Matisse, Cassat, Braque, Miro, Rouault, Benton, Pissarro, Gainsborough, Michaelangelo and Da Vinci all remained productive and even produced some of their most highly regarded works well past the age of 65. Folk artist Grandma Moses began painting at age 73, held her first exhibition at age 80, and continued painting (by popular demand) up to the time of her death at age 101, having by this time achieved an international reputation.

At age 75 (and on his deathbed) Duke Ellington asked his son to bring him manuscript paper so that he might continue to work on his jazz opera, Queenie Pie. During the last ten years of his life Ellington composed his

Second and Third Sacred Concerts, The Far East Suite, the Timon of Athens Suite, The Virgin Island Suite, The Murder in the Cathedral work, The Latin American Suite, The New Orleans Suite, La Plus Belle Africaine Suite, The Goutelas Suite, The Togo Bravo Suite, The Afro-Eurasian Eclipse Suite, The River (for the American Ballet Company) and 137 shorter compositions.

While numerous examples of highly productive and creative people may be cited, the American value system offers little encouragement to the average senior citizen to expand his or her mind or indulge in innovative or divergent thinking. This is primarily the result of anxieties that such activities will bring unfavorable criticism from peers, or it may be partly because of self-underestimation of their ability to create. Gregory Bateson has written,

Man lives by propositions where truth depends upon his believing them. If he believes that the old are no good, weak, stubborn . . . then to a great extent that will become true of the old in the population where that is believed and the old themselves will believe it and will reinforce the general belief that that is so. (1950:52)

In America, the power of the myth (that old folks cannot be creative) has perhaps become a self-fulfilling prophecy for the elderly who either are convinced that they cannot learn and use their imagination effectively or that maintaining an interest in such activity is inappropriate at their time of life. It takes a very strong and independent nature to stand against the opinions of friends, relatives and the general public who believe that some kinds of activities are unseemly for old folks and that it is better to "act one's age."

Margaret Mead has pointed out how cultural ideas can have a tremendous impact on creative thinking and performance. Ours, she has pointed out, is a youth oriented society where it is only appropriate for young people to create the products that are novel and imaginative. Older men and women, who in retirement, return to college to acquire new knowledge are often looked upon as eccentric and unconventional.

Mead has further suggested that some of our attitudes toward late life learning may indeed stem from our particular religious heritage. She maintains that in Bali, for example, there is no concept whatsoever that associates age with the ability to learn or to create. If

an individual at age 70 or 80 wishes to learn how to carve, paint, play a musical instrument, or dance, no one is surprised or shocked. The aged are encouraged in these activities because in their cultural context this makes sense. The Balinese believe in reincarnation, and therefore what is begun in one life can be carried over into the next. In the Judeo-Christian tradition, on the other hand, people have but a single life to live, and learning and experimentation is considered to be necessary and appropriate only in youth.

Still further insight into the force of culture as a sanction for creativity is to be observed in a study of Brahmin folk painters in West India. Investigation of 110 such artists by Renaldo Maduro in 1974 found that creativity among this group appears to peak in early middle age and then remains constant into old age. These painters were asked to rank one another in regard to degree of creativity, and Maduro administered the Barron-Welsh Revised Art Test which can be used to scale creativity. While there may be some question about the cross-cultural validity of this test, Maduro maintains that these measures indicated that the older artists suffered no decline in creativity as compared to their younger colleagues. But here again it is important to understand this phenomenon within its cultural context. In the Hindu life cycle the final stage of life is designated the "forest hermit" period. This is the time of life when a man has fulfilled his family obligations and has also satisfactorily performed his duties to both his caste and society. At this stage he may now "turn inward and contemplate the inner light," and as a consequence, "a man's powers of imagination increase fourfold because he has learned to reach into himself for light, bliss and balance" (1974:308).

While I had been interested in studying aging cross-culturally, and particularly the impact of modernization on age status, since 1962, the question of creativity in senior years had not been an interest of mine until 1977 when I received a copy The Mississippi Rag (a magazine of traditional jazz) and read a review of a new LP record by saxophonist/trumpeter Benny Carter (age 71) which had been recorded live at the Montreux Jazz Festival in Europe. Having worked as a professional jazz saxophonist myself at various periods of my life, and having idolized Benny Carter since I was a boy, I eagerly read the review which stated that "Benny Carter is playing better than at any time in his life." This was also about the time that another jazz performer, blues singer Alberta Hunter, was very much in the public eye, because at age 80 she had come out of a 50 year retirement and was one of the hottest attractions on the

Greenwich Village nightlife scene. She had been making numerous television appearances and her records were much in demand.

These examples of especially gifted artists still performing prompted me to wonder how many other jazz stars who reached their peak of popularity during the 1930's might still be playing and might also be "playing better than at any time in their life." A trip to Leonard Feather's Encyclopedia of Jazz revealed that Count Basie was 74, Benny Goodman was 67, Roy Eldridge was 67, Lionel Hampton was 65, Earl Fatha Hines was, 73, Mary Lou Williams was 68 and Red Norvo was 70. In spite of their age I knew that all had continued to record, play jazz festivals and make world tours with various kinds of jazz groups.

It was at this time that, considering my interests and background in both gerontology and jazz, I came to feel a study of senior citizen jazz performers would be an appropriate way to test or at least shed light on the whole question of age and creativity, because jazz playing by its very essence involves a maximum of creative, spontaneous activity.

In the summer of 1978 I contacted a former saxophone teacher of mine in New York, Walter "Foots" Thomas (once musical director for the Cab Calloway orchestra) and Milt Hinton (who I had worked with at a collegiate jazz ensemble competition at my university) to help me arrange a series of interviews with senior jazz musicians still active in the business. They assisted in establishing contact with Mary Lou Williams (piano), Eddie Barefield (tenor saxophone), Doc Cheatham (trumpet) and Andy Kirk (former leader of the Clouds of Joy orchestra and now a conductor and composer). The following year I traveled to Los Angeles and acquired interviews and observed performances of Marshal Royal (alto saxophone), Johnny Guarnieri (piano), Jess Stacy (piano), Eddie Miller (tenor saxophone), Howard Rumsey (bass), and Nappy Lamare (guitar, banjo and blues vocals). On both of these trips I had the able assistance of John W. Thomson, head of Jazz Studies at Wichita State University.

Before I discuss the particulars of what I learned from my interviews, observations and investigations of this sample of jazz greats I believe that it would be appropriate to discuss what is meant by "creativity" and why jazz musicians represent an especially fitting sample of artists with which to test the capacity of the elderly to function creatively.

In his book Creativity and Innovation John W.



Haefele defines creativity as "the ability to formulate new combinations from two or more concepts already in mind" (1962:5). And in a special article titled "Creativity," jazz bassist and composer Charlie Mingus maintained that "creativity is more than just being different. Being different isn't necessarily being original. Anybody can play weird; that's easy. What's hard is to be as simple as Bach. What you have to do is know where you're coming from, be able to do what's gone before, but go on from there in your own way. Go where you go but start from somewhere recognizable" (Mainliner 1977:25). He also contended that "love of something sparks creativity." In the same article someone from a very different area of art--that of gourmet cooking--sounded a similar note when defining creativity. Julia Child insisted that "What is new comes out of what is old. To be truly creative involves taking the art form seriously, really learning the basics. It is a lot of work" (1977: 31).

All of these ideas are very much in line with the theoretical position of William F. Ogburn, a well established authority on social change. In discussing the creative process he states that since an innovation is made up of "existing elements of knowledge, any particular invention can be made only if the elements which go to make it up are known; a positive correlation exists between the number of inventions made at any given time and the size of the existing accumulation of old culture traits" (Ogburn and Kimkoff 1958:643-644).

In other words, all of our experts on creativity would agree that birth of the new comes from the old; that no new work, however original, is without roots in the past, and in the tradition of the art itself. I believe that it should also be understood that when a number of the older musicians interviewed maintained that they are not making a special effort to keep up with modern trends that that did not mean they are no longer playing creatively. They are continuing to elaborate, develop and expand upon what they have already experienced; they are drawing upon a lifetime of experience with multiple musical styles and a host of valuable impressions gained from the skill and artistry of the musicians with whom they have shared the bandstand. I believe, as gerontologist Robert Butler has stated, that the "the essence of so-called new ideas or new forms is not a test of creativity per se, because one's mode of being, one's past interests, training, skills, experience, may be creatively elaborated and expanded. • The fact that other 'new directions' do not occur is not equivalent to declining creativity" (1967:39) •

For the jazz musician the very essence of the art is creativity. If one is not capable of imaginative improvisation then one is not truly a jazz performer. Charles Nanry defines the essence of jazz playing as follows:

Improvisation in music means pretty much the same thing it means in other areas of life. It is a synonym for spontaneous creativity, for solving a problem that has not been solved before when working with existing materials. In jazz playing, improvisation usually refers to melodic invention that is created out of conventional melody. (1979:17)

What Nanry is saying is that the jazz player is not actually composing, although there are many jazz artists who do compose, but rather that the jazz soloist in his or her improvisation is developing a new melody which relates to some standard existing melody and chord progression. Every time a jazz musician plays a solo there is the expectation that a new counter-melody will be produced which will make reference to the composed melodic line of the song writer and will keep within the harmonic structure of that composition. The hallmark of a good jazz player is the ability to improvise, and this sets him/her apart from the good classical musician, although some improvisation is found in classical music as well, but it is not typical of it.

Whitney Balliet amplifies further on the art of jazz improvisation, stating "Jazz musicians are at the mercy of a particularly demanding music. Improvisation, the core of jazz, insists that a performer be an instant and nonrepetitive poet, not simply an assiduous reader of orchestrations, and that he be this lyric creature several hours a night, six nights a week, year in and year out" (1966:240). When one's reputation and livelihood depends on this ability to improvise with imagination and be accepted by the jazz public (a critical audience indeed) on the basis of such skill, aging could conceivably be a particularly precarious and painful situation if old age is, as the myth suggests, a time of intellectual and creative decline.

Our somewhat randomly selected sample of senior jazz people proved to be interesting from the standpoint of creativity and adaptability. Johnny Guarieri, for example, felt that the creative quality of his piano work had been constantly improving. In the early 1970s he had begun to play many of his numbers in 5/4 time instead of the usual 4/4 because of the new and different effect it

produced. According to Guarnieri, "You have to do something different to be noticed."

Milt Hinton, former Cab Calloway bass player, rejected the idea that age diminishes creativity and explained, "I'm less daring than I used to be but more sure of myself. My technique has improved and I can draw from my experience."

Mary Lou Williams believed she was playing better than when she was young because she had had the opportunity to play through a number of musical style eras and had been influenced by all of them. She spent considerable time talking about her recent concert where she shared the stage with avant garde pianist Cecil Taylor. She concluded, "I'm playing better than I've ever played in my life. The older you get the better you are. It takes a long time to become seasoned. I think I'm improving creatively. I think you can tell it from my records. The recent stuff is a lot better." Pianist Marian McPartland agrees. She is on record as stating, "Mary Lou always believed in what was new and creative . . . She kept moving along with the times; that's what I like about her most of all."

Jess Stacy, at age 75, had just cut two solo piano albums without a rhythm section, an entirely new experience for him. He confided, "I didn't know if I could even do it. But I took a chance and said I would do it, and I think it turned out real good." In discussing Jess's performance on the albums, George Avakian describes him as a musician with "razor sharp time, errorless fingers and a musical sense and spirit that have grown through time."

When I returned from California and began transcribing our interview tapes I accidentally came upon three reviews that appeared in Down Beat magazine in 1975, 1976 and 1979. In a way I felt that they expanded the evidence about creativity and age and are worthy of being reproduced in part in this discussion. All the reviews were written by the same person, John McDonough, of concerts by Benny Goodman at the Ravinia Festival in Highland Park, Illinois. In 1975 McDonough wrote:

Unlike many veterans of Goodman's star status, the clarinetist has refused to fall into routine solo formulas. •. Anything can happen, and when it does the excitement is unmistakable. • Even when cruising, there is a freshness of thought in the uncluttered construction of his lines. In this respect, Goodman seems to have grown

considerably in the last decade.

The following year, when Goodman was 64 McDonough reported concerning his playing:

The capacity for surprise is constantly there. And the exceptional can always lie just beyond the next bar. Goodman has kept his integrity as an improviser.

And in 1979, when Goodman was 67 McDonough wrote:

Goodman's concerts are often among the most spontaneous jazz performances heard today . . . Goodman was full of simple powerful ideas that swung without mercy . . . Throughout the performance Goodman played with exceptional fluency and feeling. . Goodman seems to be still at the top of his form and anxious to play.

We had wanted to schedule an interview with Benny Goodman but received a very pleasant note stating that he would be out of the city during our visit.

While our sample included many cases of sustained and even growing creativity, the most convincing example of an older musician who had demonstrated an ability to move in a new creative direction with skill and imagination was Adolphus "Doc" Cheatham, who in 1979, at age 73, and still today at age 84, is one of the most respected and sought-after jazz trumpeters in New York City. One review of a Doc Cheatham record album maintained that if this elderly trumpet player isn't the best horn man working the New York scene today, then he is surely the most neglected by the public.

The interesting thing about Doc Cheatham from the creativity standpoint is that although he has been a professional musician since he was a teenager in Nashville, he did not begin a career as an improvising jazz soloist until he was 64 years old. No wonder he tends to think of himself as an "old cat who can learn new tricks." After playing the local Nashville scene for several years, often backing up jazz greats as Bessie Smith and Ma Rainey at the Bijou Theater, in 1926 (at age 21) Doc Cheatham packed up his horn and headed for Chicago, a mecca for all jazz musicians at that time. But after being fired on the opening night of his first job because he couldn't read a note of music, Doc returned to Nashville and learned, since he was certain he wanted a

career in music.

He then discovered that opportunities for a trumpet player were better if he would play lead trumpet. He claimed,

"No one wanted to play lead trumpet because there was no opportunity to play solos. It's too much for one man to play lead and solo too. But I decided I would do anything to get a job. And I learned to like lead trumpet, and I didn't see where it was going to do any harm to me, but it did. Nobody ever heard of me."

Doc played lead trumpet with Marian Hardy's Alabamians, McKinney's Cotton Pickers, Cab Calloway (8 years), Benny Carter, Chic Webb and Teddy Wilson orchestras. He even played lead trumpet with a series of Latin bands such as Marcelino Guerro, Prez Prado, Machito and Vincentico Valdez. He played lead trumpet for over 40 years, and sure enough, nobody ever heard of him--until Benny Carter invited him in 1969 to play with him in a salute to Louis Armstrong at the Monterey Jazz Festival. And this was not a lead trumpet job but a solo trumpet opportunity. Lee Jeske described that performance in a 1981 Down Beat feature article on Cheatham. He wrote,

"His one solo on '5truttin' with some Barbecue' was the beginning of a new phase in the career of Doc Cheatham--from lead trumpeter to name soloist in the course of one chorus" (1981:27).

Doc's next big break came when Benny Goodman approached him shortly after the festival with an offer to tour Europe with him as a jazz soloist with his quintet and sextet. While Cheatham had undoubtedly played some jazz solo horn sometime during his lifetime (perhaps at after-hours jam sessions) he now embarked on a new kind of career which called for creativity and imagination in improvising the music which, for so many years, he had merely played as written off the manuscript page.

In describing the metamorphosis of this great jazz star Lee Jeske wrote,

"Once the thorny label of "lead trumpeter" was removed, Doc Cheatham emerged as one of the sweetest, most elegant soloists we have--he has a lovely, soft, singing tone and a delightful, parenthetical way of improvising\_. With his two elbows spread out like wings and his trumpet pointed skyward, Doc Cheatham can solo with the best of them, and he's finally getting his chance" (1981:26)

The quality of Doc Cheatham's creativity is further documented by Whitney Balliet who describes his solos in New Yorker as "moving with logic and precision of composition, yet they have the spark of spontaneity.

Like most players of his generation, he is a master of the embellished melodic statement" (1979:120)

Doc's new career as an improvising jazz player has not only brought him recognition from musicians, critics and fans alike, it has brought him more money than he ever thought possible. He was asked to join the prestigious New York Jazz Repertory Company, and he recorded the sound track for Robert Altman's film Remember My Name with Alberta Hunter. In the last few years he has played in nearly every jazz festival in Europe and North America, toured Russia, recorded with Buck Clayton, Jay McShann and with small groups of his own, and was a guest of President Jimmy Carter at a jazz concert the south lawn of the White House. Cheatham has not only distinguished himself as a top jazz player but has begun to do scat singing as well. One of his offerings, "What Can I Say Dear After I Say I'm Sorry" became a big hit in France.

Seven years ago Doc Cheatham went into the Sweet Basil club for a two week engagement and he is still there. He also works steady at the Roosevelt Hotel's Crawdaddy restaurant, at the Wa Chong restaurant, at Michael's Pub, The Ginger Man and The Overseas Press Club. His two new record albums, It's a Good Life and The Fabulous Doc seem to convey in their titles alone the story of the one-time lead trumpet man who refused to believe that advancing years means that one must forego creative activities and settle for a rocking chair.

But why does the Doc Cheatham story read so differently from that of the average elderly American? To begin with, we might call attention to the Charlie Mingus contention that "love of something sparks creativity." In my interview with Cheatham in his apartment in New York he confided:

"I'm looking forward to living a long time and playing. Playing and living. I have a burning desire to play and play. That's why I never drink whiskey. I already have my addiction." And when I asked him what ingredients are essential to a good jazz performance Doc stated, "First you have to like what you're doing. Some people say that they hate some of the tunes they have to play. You should make yourself like whatever you have to play. Louis Armstrong taught me that."

And in commenting on the role of experience in creativity Cheatham maintained, "I also think a good jazz player should be flexible and versatile. I don't like doing just one kind of thing in music. For example, I don't want to get stuck playing with just one group. You need a wide range of experience. With all the different kinds of bands and all the different people I've played with, I have a lot to look back on and a lot to draw on. It's been a big asset in my playing. It's hard to beat experience. And it's also good to have played all kinds of tunes. The more tunes and their chords you know, the easier it is to function as a good jazz soloist."

The fact that the greater number of the musicians we interviewed and observed perform were definitely growing in musicianship as well as creativity can perhaps be explained by the possibility that our sample was made up of very exceptional people and not just the run-of-the-mill performer. In a profession in which death at an early age is all too common, Doc Cheatham and the rest of our sample had achieved remarkable longevity. Perhaps they are among the fittest of their profession in mental health, artistic motivation, and capacity to adapt to the physical and cultural restrictions imposed on older people by age itself and by society. In general they approach jazz as an important life work and speak of their art with a sense approaching reverence. Their music is characterized by structure; their solos are seen as mini-compositions. They think of themselves as composers and not just as performers of someone else's creations. Their musical interests are eclectic, and by and large, they like the classics and are tolerant of new jazz trends and avant garde artists.

Not only are these jazz greats capable of exceptional artistic creativity but they are handling old age with skill and resourcefulness. They live in moderation, working sensible hours, traveling only when it suits them and guarding their health, which is regarded as no less a valuable commodity than their musical talent. These people live in the present and have an eye to the future. They love their music and their lifestyle. None expressed this better than 80-year-old Andy Kirk who concluded his interview with: "Heaven is my home, but I'm not homesick."

We must also consider the fact that the cultural context in which these people function, like that of the Balinese or the folk painters of West India, is indeed very different from that of the average elderly American. Alan Merriam and Ray Mack once wrote in an article about the "Jazz Community" that "there is the almost total lack of prejudice on the basis of race, religion, ethnic

origin, etc. There is probably less prejudice of this sort in the jazz community than in any other segment of American society" (1959-1960:219). It would appear that it is also possible to state that there is less discrimination based on age in this community than in any other. When good jazz musicians play, their peers and their special public turn out to applaud and enjoy them without reference to age. In speaking about young musicians, Doc Cheatham says, "They seem to accept me and appreciate the things I do. Even teenagers seem enthusiastic. When they come out to hear us they often rave over what we do." Marshal Royal maintains that he is often contacted by directors\_of young rehearsal bands (ones that get together for rehearsal only so musicians can increase their skill) in Los Angeles to come to their sessions and give their sax sections some pointers. After 20 years as musical director and lead alto player with Count Basie they believe he has much to offer on how to phrase, blend and execute. He jokingly adds that they like him to come because instead of having to pay \$50 a piece for a private lesson the whole sax section gets a lesson for free. It is undoubtedly satisfying for Royal to still be in such demand as an instructor of young musicians.

Eddie Miller remains one of Los Angeles' more respected musicians of any age. While Miller tends to play with a number of musicians roughly his age--John Best, Nick Fatool, Bobby Haggart, Nappy Lamare--he states that most of the young musicians "know my background and I am treated very well. That is what makes me feel good. I don't know what they say behind my back but they have all been very complimentary."

Robert N. Butler writes that "in the presence of health and in the absence of personal and social adversity, creativity is more apt to persist into late life" (1967:38). While all of our jazz greats spoke of tough days on the road when they were young, and great anxieties over making a living in jazz, all but a very few are now extremely enthusiastic about their lifestyle and their opportunities to perform. They are involved in an environment where they are expected to improvise well because they are jazz musicians and improvisation is the essence of their art. They are not afraid of criticism for not "acting their age," for age is not all that important to peers or public alike. And perhaps because they have been life-long performers, they are freer from conventional restraints on behavior. They believe in their art and their ability to perform it. It is the self-fulfilling prophecy that makes creativity possible.



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## Hmong Ethnoastronomy

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Not much is known of the appearance of the Hmong as a people. They were first identified as a separate people, called Miao or Meo, in China. In the earliest Chinese literature, accounts make reference to them as residents of central China in the areas of the Yellow and the Yangtze rivers at about 2300 B.C. The so-called "Miao (or Meo, meaning "barbarian" or "sons of the soil"),

.could not be pacified, were exiled to the province of Kansu, where they apparently disappeared. Some of the Miao were absorbed, but others migrated southward or westward as the Chinese advanced. •(Graham 1954:1-2).

With the Han civilization expanding outward from the Yellow River valley, minority ethnic groups like the Miao

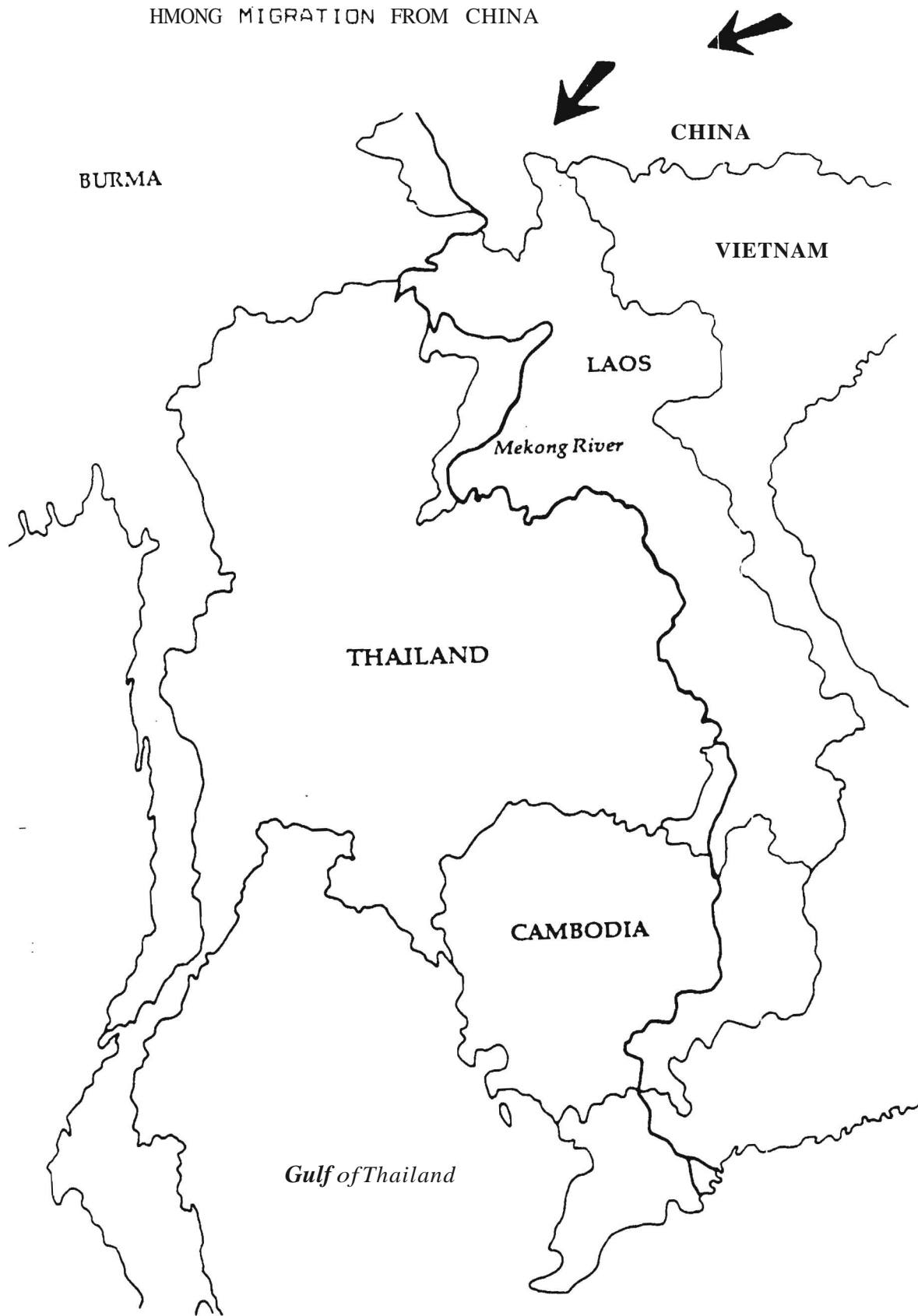
.which once shared the fertile heartland with the Han Chinese were pushed back to the periphery of expanding Chinese civilization. ••these minorities never embraced the Chinese language, mores or ethnic identification. .they often chose rebellion or flight rather than submission to the political domination of the Han Chinese (Sutton 1984:1).

Most of the Miao left China around 1825-1830 for the mountains of Laos, Thailand, Vietnam and Burma in search of more desirable farmland and less political dominance (see Figure 1). These people resented the name "Miao" and began to refer to themselves as "Hmong" meaning "free"1.

Practicing slash and burn agriculture, the Hmong were a nonliterate society until the 1950's when Christian missionaries devised a Hmong language alphabet and eventually a translation of the bible. A few Hmong then had the luxury of obtaining a sixth-grade level education<sup>2</sup> prior to the Vietnamese War.

It has been estimated that there were about 350,000 Hmong living in Laos in the mid-1960's. They isolated themselves in the rugged mountains in order to preserve their culture and traditions and were known as the

HMONG MIGRATION FROM CHINA



"warrior race of Laos . . ." (Dommen 1985:6). The National Geographic reported "crack Hmong guerrillas became the undeclared muscles behind U.S. foreign policy" which was financed by the CIA during the Kennedy administration. Probably as many as 30,000 - 40,000 Hmong guerrillas died in the CIA's "secret war" in Laos (Garrett 1974:80).

As the United States pulled out of Southeast Asia, the Communists, knowing the Hmong's connections with the CIA, sought to exterminate the entire Hmong culture. Very few Hmong survive in Laos today. About 50,000 Hmong live in Thailand refugee camps (see Figure 2), and 70,000 have been resettled in the western world (France, Australia, Canada and the United States; Gordon:1984).

### Hmong Directionality

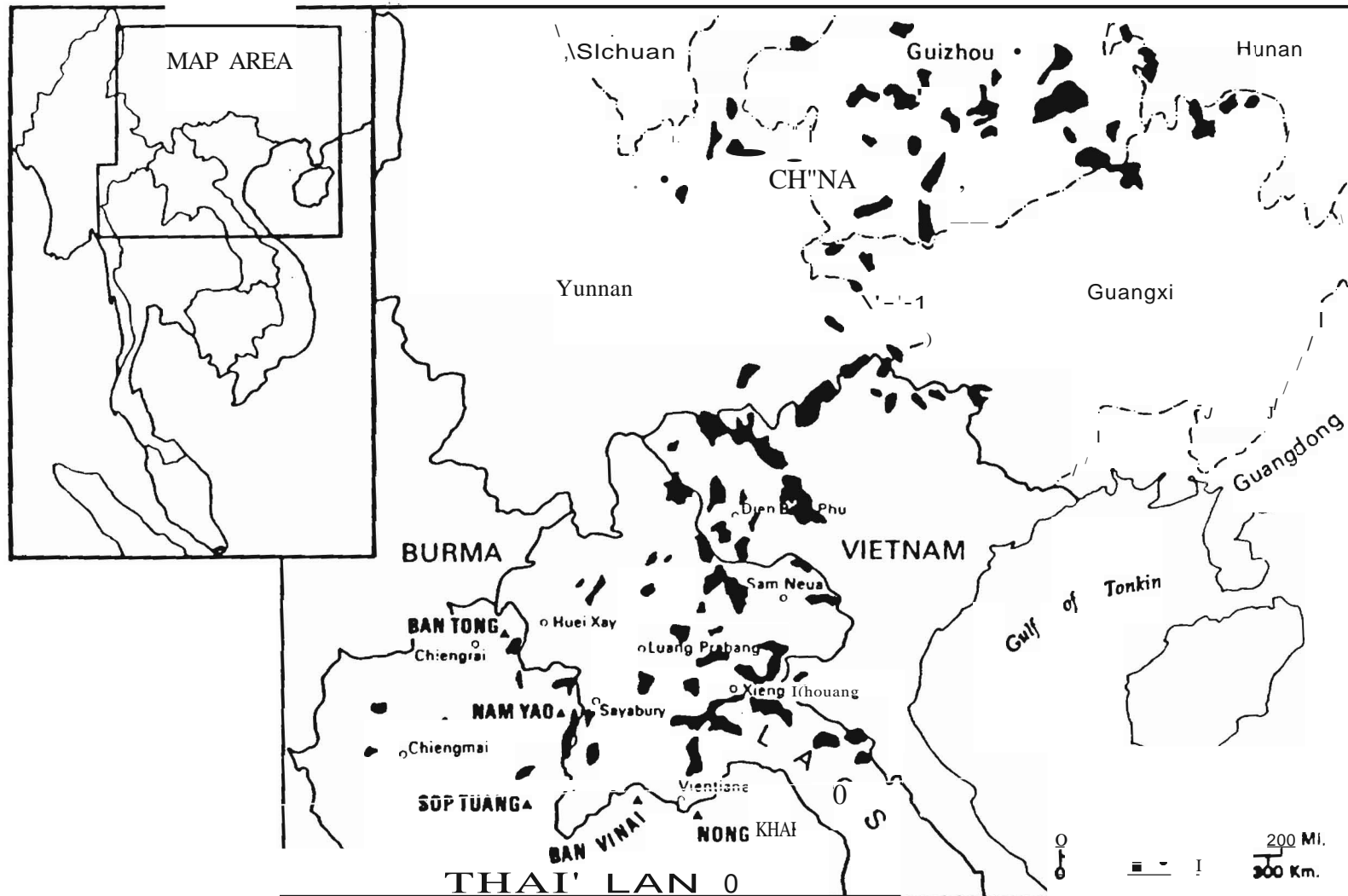
Life on Loation mountain slopes may have led to the two directional ways organizing the physical/geographical world outside their house. All things are either up the mountain or down the valley/to the river (see Figure 3). These directions are quite opposite from each other yet do not necessarily match any specific N/S/E/W orientation. Johnson indicates that

in their traditional life, the Hmong did not seem to feel any need to indicate the directions we mean by north and south. Much more important to them was whether one location was farther up the mountain than another, or in the direction of the valley from it, and these expressions for uphill and downhill have been adapted in various ways to indicate north and south (1986:19).

Although my consultants generally agreed with Johnson's comments, they occasionally used the term quam teb (above + earth [meaning soil, water and stone]) for "north" and qab teb (under/bottom/end + earth) for "south". Other linguistically linked terminology which may involve the N/S adaptations spoken of by Johnson, include quam tsev (above + house), interpreted by one consultant as either "back of the house" or "up the mountain", and qab tsib taug (no direct translation possible) again, as either "front of the house" or "down the valley/to the river" (see Figure 4).

Finally, in regard to N/S orientation, it was brought to my attention that many of the Hmong men, when hired by the CIA during the war, were instructed in "true" N/S direction via the western compass. One of my male consultants, suggested that after learning to use a

FIGURE 2

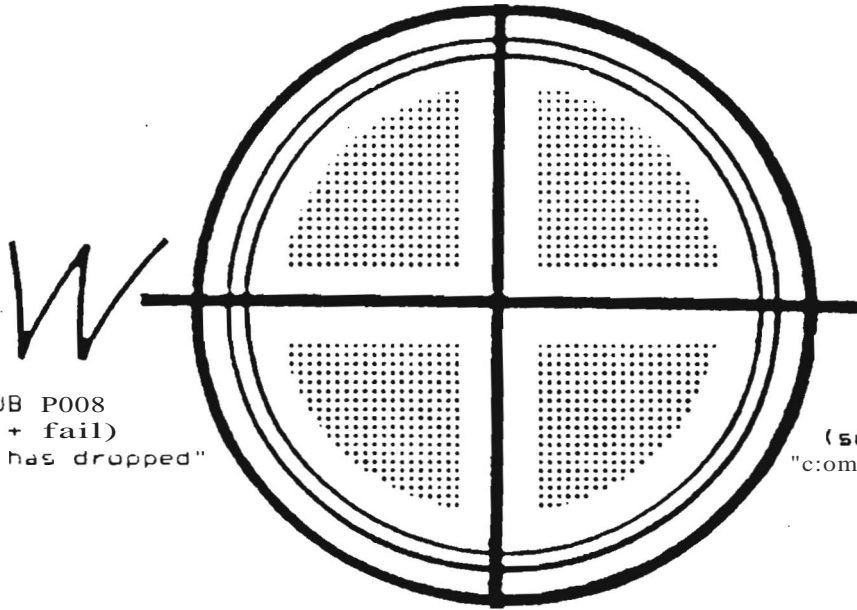


Hmong Homelands and Refugee Camps.

"CARDINAL" DIRECTIONS FOR THE HMONG

OAUM TEB  
(above + earth)  
"up the mountain"

N



NHUB P008  
(sun + fail)  
"the sun has dropped"

NHUB TUAJ  
(sun + present/gift)  
"coming through the door"

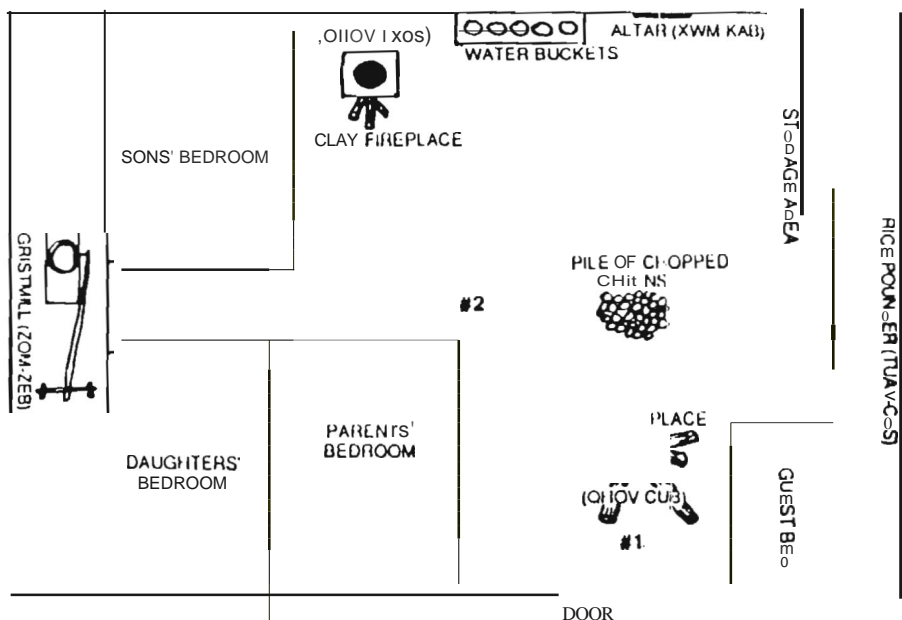
S

QAB TE8  
(under/bottom/end + earth)  
"down the valley/to the river"

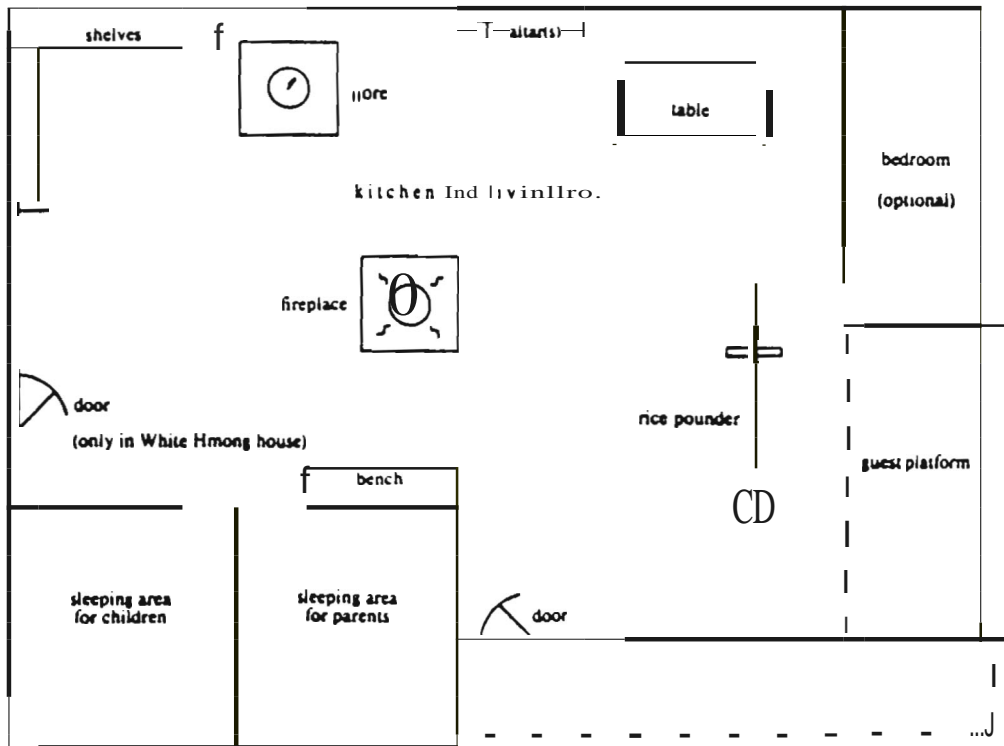
t  
TOP OF IT II: MOUNIAIN .  
QAUIMISEV

11' QAB OHOV .CUO:  
BELOW THE FIREPLACE  
#2: QAB CAIS,  
NEXT TO THE HALL

(Vang and Lewis:1984)



VAI LLY  
CAII-TSIB-IAUG



(Lewis and Lewis:1984)



compass, his map reading skills and, consequently, the ability to find his way around larger urbanized areas of Laos led to his eventual abandonment of the Hmong traditional terms "up the mountain" and "down to the river". "'North" is different now than what it used to be", Xang relates (personal communication:1988).

The sun plays a prominent role in the word-play and naming of the terms "east" and "west" (see Figure 3). To the Hmong, "east" is *nhub tuaj* (sun + to come)<sup>4</sup>. My consultant suggested to me that the inference here is that "the sun is growing or coming through the door"; however, I can find no linguistic correlations between "growth/grow" (*kev hlob*), or "door" (*qhov rooj*) with the word for "east". Johnson (1986) also denotes that another phrase used is *hauv ntuj* (origin/beginning + sky) as "beginning of the sky." To the agricultural society of the Hmong, the sun was an important and prominent feature.

The word for "west", *nhub poob* (sun + fall or drop) appears to be more of an action-word giving the connotation of the sun dropping (like a ball would drop or a crop would drop/fail). Other informants have used the word *qab ntug* (under/bottom/end + sky) (Johnson: 1986) which is interpreted to mean "end of the sky". Occasionally, where there is a bright sunset, the Hmong will sometimes say, "*qab ntug daj rhuv*" or "the end of the sky is bright yellow".

It should also be noted here that another informant, Tong Ly (younger than my other informants), suggested that the traditional Hmong views and the language inference of "east" and "west" are "word-pictures of sunrise and sunset" rather than a strict location on the horizon (personal communication:1988). The above information also presents us with the possibilities and problems that might occur when a Hmong house, for instance, is situated on the west face slope of a mountain. Does this mean "up the mountain" (north) and "sun to come" (east) are the same direction? My informants were not able to relate any situations in which this might have occurred.

Sun (*Nhub*)<sup>5</sup> and Day (*Nhub No*)

My consultants made no mention of the sun's different horizon rising and setting points and did not appear concerned with the sun's overall movement across the sky during the day nor during the year. Vang & Lewis, describing the farmers' attitude while working, explains the

Hmong used to say, .when you work, don't work like a green snake that's almost dead. (Keep your head down and your eyes on your work.) Don't bend your head backwards to watch things. Don't watch the progress of the sun too much (tsis txhob ntsia lub hnub heev heev). A person who works in the wrong way will end up without enough to eat, enough to drink like all the others in the village (1984:155).

Although this describes a subtle aversion to sun-watching, it may be more indicative of a work-ethic, lesson-giving device than an actual comment about the sun. Indeed Mai Lee Yang ascribes motion to the sun with her use of the word sab (half, between, side), which sometimes precedes the various above mentioned Hmong east/west phrases to describe the terms for "noon", or "afternoon" (personal communication:1988). Also, the words signifying "day" or "today" are nbun no, they literally mean, "sun + cold". Does this phrase infer that before sunrise at dawn the sun is cold and, as it moves upward into the sky, becomes hot? My consultant, Xang, could not explain the use of the words "sun cold" for "today"; however, it is interesting that ".legends tell of a time when Hmong lived in a cold land with ice and snow, and where night lasted for half the year" (Vang & Lewis 1984:6). The sun affects all life. Storyteller Nhia Lor Yang explains why there is day and night:

Long ago, there were nine suns and nine moons. When it was night, it was night for a very long time. When it was day, it was daytime for a very long time. The people of the worked could not work enough to have sufficient to eat, and they were angry. They made a cross-bow nine **dag** (unit of measure, the distance between the tips of the fingers when the arms are held shoulder high, stretched out to the **side**; about five feet) long and eight **dag** wide, and went to shoot the suns. The suns and the moons were very afraid and were not willing to come out. The earth was dark for seven years and people of the world could do no work to get food to eat. They said, "What kind of animal can go and call the sun and the moon to come out?" They sent the bull to call, to see if the sun and moon would come out, but they would not. They sent the tiger to call,

to see if the sun and moon would come out, but they would not. They sent the bird, the lib-nyug (similar to a hawk) to call, to see if the sun and moon would come out, but they would not. They sent the rooster to call, to see if the sun and moon would come out. The rooster called and called, and the sun came out for a little while (daytime), and then the moon came out for a little while (night). Since that time there has been daylight and nighttime, so that people can work, and have enough to eat, and they have lived until now (Vang & Lewis 1984:17) .

It is interesting to note that the rooster in this story only appears to call one sun (and moon) out, rather than all nine. But, the latter concurs with Sia's statement that "there is only one sun, it goes away at night and comes back in the morning" (personal communication:1988).

The sun's movement is often segmented into named days. Even though apparently not describing successive days of the week, Vang & Lewis present one set of days during the fourth month of the year:

During this month we watch for a day that will be a good one for burning. We Hmong count our days by using a cycle of animal days--monkey day, dragon day, rooster day, etc. Different days will bring different results in burning. If we burn on monkey day, the fields burn very fast, but not completely. If we burn on a dragon day, then the air will be too humid and not good for burning. We could then 'see a tiger'--patches of unburned growth, that from a distance, looks like markings of a tiger. A good day would be a cow day; the fire burns strongly and the growth is completely burned. We hope for a day that has a good wind and is hot enough. We all burn at the same time, for instance at noon on a set day.  
(1984:167) •

The above animal/day representation will be discussed further with regard to the New Year's celebration.

The Sky (Ntuj)

In "La Creation Du Monde" Mottin (1981) suggests that

Hmong speak of several different "levels in the sky." Indeed, in the folktale Shee Yee and the Evil Spirits, we read of a hawk that it

.flew up three times, each higher than before: the first time ib nta ntuj (rather high into the sky, to the middle altitudes). .the second time ib nta ntuj ntag (really rather high into the sky, indeed, even higher than the middle altitudes). .the third time, to the extreme limit, clear to the other side of the world ("sab ntuj nraum ub lawm") (Johnson 1986:96) .

Even though it appears as if the hawk flew to the other side of the heavens, the Hmong expressions used here only connote the physical sky (where there are clouds and air) .

The structure of the sky is portrayed in Mottin's information; he concludes that the heavens are held up by a column whose foundation begins on the earth. This concept is also found in Johnson's material."

The Hmong conception of the sky ("ntuj") is that of a circular disc supported by a central column, or an inverted bowl like an umbrella covering the earth. There is a door in the sky, leading to the realm beyond, which is the domain of "huab tais quam ntuj", the king of the region beyond the sky ("quam ntuj"), who is more powerful than other spirits which live there, but is inactive and indifferent (1986:22).

Expressions such as "suam ntuj" (on, above, on top of, up in the sky, or above the sky, in the heavens) and "quam ntuj" (the high heavens, heaven beyond the firmament) are other ways to describe the region or place of the kung of heaven. The latter phrases denote a spiritual or "otherworldly" sense rather than physical sense of the word "sky".

In Johnson's (1986:62) notes on Shee Yee and the Evil Spirits these names for other regions of the sky also appear: sauro ntuj and, interchangeably, quam ntuj (beyond the sky). These regions were places where

legendary spirits had access to the earth, and to which legendary earthling heroes had access, by means

of a door in the sky ("lub rooj ntug"), through which they could move back and forth during their exploits and adventures.

These places "beyond the sky" are not, as most consultants agree, the same place as the "abode of the dead" ("dab teb") or ("ntuj txias teb tsaus" literally, sky-cold-land-dark) where the souls of dead ancestors reside.

In Hmong belief, (the spirit world) is generally thought of as being a mysterious realm of unknown location but probably on the same plane as the world of men, or even under the ground. In any case, this land of spirits also communicates with the world of earthly people by a door (Johnson 1986:62).

Teng Chu, in the story The Beginning of the World (Johnson 1986:16), is the one who lifts up the sky, stretches out the land and becomes lord and master of the universe (the heavens and the earth). However, it is elsewhere noted that other names for this lord and master are Ngao Njua and her husband Na (Mottin:1981), Ngao Njua and Shee Na (Johnson:1986), and Ntuj (Mottin:1981). With regard to the latter name, Johnson (1986:16) relates, "the Hmong myths collected by Jean Mottin in Thailand have "heaven" or "the sky" ("ntuj") creating the earth, so Mottin takes Ntuj to be the Hmong Creator God". While Ntuj mayor may not be the official name of the Hmong creator God, Yang & Lewis (1984:130), when speaking of the birth of a new baby state,

It doesn't matter whether it's a boy or a girl; Hmong say that it's your fortune, your luck, or your blessing from the sky ("ntuj"). (Emphasis and parentheses mine).

Other sky sayings listed by Yang & Lewis (1984:78,36):

- Xav luaj ntuj, Xu luaj nyuj  
(wish big as sky, miss target big as cow) = Aim for the sky; Hit the cow.
- Niam txiv piv tam lub ntuj; Tub ki piv  
-tam lub teb  
(mother father compare as sky, children compare as earth) = Parents are like the sky; Children are like the earth.

star (Nhub Qub)

Storyteller Tong Ga Vue in Grandmother's Path, Grandfather's Way (Vang & Lewis 1984:21) explains why there are stars in the sky.

Once there were no stars in the sky like there are now. Long ago the king of heaven had a daughter, named Princess Nou Kou (nhub qub or "star"). She had a big goiter on the side of her neck. Nobody liked her, and there wasn't any young man to marry her. She did not have a husband. She ran away to build a house deep in the heart of the jungle and she lived there alone. She had only a dog to be her companion.

She lived there for a long time. There was a mother ghost who came along and saw her. The mother ghost loved her and took care of her. The mother ghost gave a lot of silver and a lot of gold to Princess Nou Kou, therefore, she was very very wealthy.

One day she went to buy things in the village and she used the gold to pay for the things she needed. She returned to her home, and all the gold was already there, waiting for her. So she took the money and gave it to the villagers, a few peices to each one, but the silver and gold always came back to her. She was the the only person to have silver and gold. She wanted to give away her wealth to other people, but she couldn't; the pieces always came back to her.

One day, she took the pieces of silver and gold and threw them everywhere--to the top of the mountain, to the foot of the mountain, every place--the pieces stuck where they landed. She threw all her pieces of silver and gold, and suddenly, there was a great sky full of blinking stars. That's why the sKy has stars flashing and twinkling.

The silver pieces became white stars, very clear and bright enough to see well; the gold pieces became yellow stars, not quite clear and not quite bright enough to see well.

This explanation of bright and not-so-bright stars is

interesting when compared to the literal translation of the Hmong word for "star", nhub qUub, which means "sun old". Could it be that the Hmong, even many hundreds of years ago, had a better understanding than that of their western European counterparts in regard to the commonality between "our star--the sun" and "the other stars--out there"? Or, are the stars "sun old" because, through time, they have moved farther away from the earth or appear to be "burning out"? My consultants only concluded that some stars are definitely "brighter than others" (Lee, personal communication:1988).

The latter association with the brightness of stars versus the brightness of other objects in the sky is summed up in the Hmong saying:

Ib ntuj7qub pom kev tsis cuag ib lub  
txhais hli, Ib leeg tub tsis cuag ib  
leeg txiv.  
(One sky star see way not equal one  
quarter (part) moon, one son not  
equal one father) = A starry sky does  
not light your way as well as quarter  
moon; One son does not equal a father"  
(Vang & Lewis 1984:79).

Constellation names were not available from my consultants. Through an interpreter I was told that "some Hmong elders might know something about the stars but, we did not know about that" (Lee, personal communication:1988). Xang did, however, point to the belt of Orion and explain that some Hmong talk about "stars that connect or come together", nhub qub kwv nta (stars that are lineally arranged and close in proximity). He also pointed out many sets of "stars that connect" in the night sky.

The most intriguing comment regarding the stars was the information regarding "the leader star" nhub qub koj cev. It seems there is a star which is very bright and always rises just before the moon every evening. This lone star, it is said, leads the moon across the sky nightly and is not visually identified as either Venus or Jupiter by the interpreter (Lee, personal communication:1988). I have yet to understand the concept of "the leader star" and what star or stars it may correspond with on Western star maps.

#### Moon and Month (Hlis and Hlis Ntuj)

The Hmong appear to place primary importance on the movement of the moon for their calendrical cycles, keeping track of the days per month, months in a seasonal

cycle, and the number of months in a year. When I asked several Hmong people to share with me "things in or of the sky" they always referred first to the moon (Lee, M. Yang, personal communication:1988).

Through an interpreter, Sia expressed that as a child of about thirteen she learned from her father and mother "all about the moon" (Lee, personal communication:1988). She continues to relate the cycle of the moon:

the third day of the month, it is a small *sliver*, we say it is *hlis xiab* (moon + waxing), the moon is growing. By the eighth day of the month, we say the moon is *xiab yig* {waxing + eight}-this is what you call "a half moon". I know it is the fifteenth day of the month when I see all of the moon, it is filled up (like a pitcher of water is "filled up")-we say the moon is *hlis nra*. After the fifteenth day the moon begins to "leak out" *hlis nqig*. By the twenty second day of the month the moon is "leaked out halfway". The twenty seventh day of the month is the same as the third day of the month except the moon shape is reversed (and the moon is still leaking, instead of filling up). The 29th, 30th, 1st and 2nd of each month, even if there are no clouds in the sky, the moon is all "leaked out" and I can not see it. "

When shown pictures/diagrams of the different phases of the moon, my interpreter felt it made no difference whether the moon was, in Western terminology, waxing or waning. The size of the crescent or half-shape rather than its side or angle determines the day of the month for the Hmong (see Figure 5).

Grandma Sia, also noted that there are twelve moon-cycles in one year. The moon-cycles or "months" are called *hlis ntuj* (moon + sky); this appears to be a linguistic representation of the Hmong understanding of the cyclical nature of the moon's travels over the course of a roughly 30 day period.

There appears to be no synthesis of the lunar and solar cycles. Neither Sia or Xang could recall a year-period in which there were more than twelve moon-cycles. This information may have been affected by, or be attributed to, a lengthy "escape-journey" through the jungles of Laos: "•• .In the deep jungle like that, the trees are so big and high and dense, you never see the

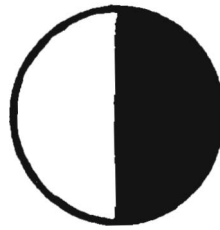


THE MOON CALENDAR

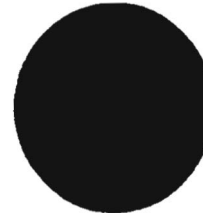
3RD DAY



8TH DAY



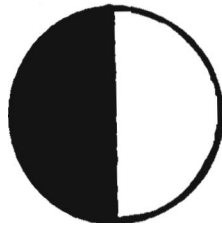
15TH DAY



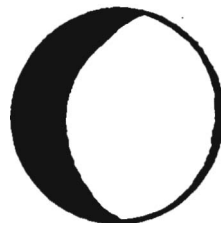
HLIS XIAB  
"The moon is filling up"



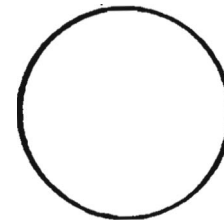
22ND DAY



27TH DAY



29TH-2ND DAY



HLIS NQIG  
"The moon is leaking out"



sunlight. " (Johns & Strecker 1986:233). In addition to the long escape-journey, the Hmong also experienced a general cancellation of all ceremonial activities relating to the New Year as well as a prolonged stay in Thailand refugee camps in which western calendars and watches were introduced, probably further limiting reliance on natural phenomena. One wonders what cosmological information may have been lost in the past two decades of extreme cultural hardships for the Hmong.

Hmong folklore regarding the moon is varied. My interpreter, having a subtle appreciation of western stories and myths concerning the moon (eg., "the man in the moon", "the moon is made of green cheese"), translated the following story as told by Grandma Sia.

Niam nkauj kub kaws  
(The Special Frog Princess)

Once there was a girl frog-princess who lived on the moon. She was very hungry. She ate and ate very much food. She laid down on the moon and fell asleep. While she was sleeping a tree grew out from her stomach. It grew bigger and bigger. She found that when she woke up she could not get up because the tree made her stick to the moon (pinned to the face of the moon). Sometimes when you look at the moon (with its many dark and light shadows) you can still see the frog princess. She is still there. (parentheses mine, for clarification)

Although the story does not exclusively express a specific assignment of female gender for the moon, it contrasts with what Johnson (1986:19) reports:

While western affective connotations might ascribe masculine gender to the sun and feminine to the moon, the Hmong conception is quite otherwise. The male, considered braver, is given night work, while the female is allowed work by day. In real life, the Hmong consider that boys and men are braver than girls and women, less afraid of the dark and of things like snakes, baby mice and earth worms.

The moon therefore, regardless of gender, is still a most important facet of time-keeping for the Hmong.

Hmong New Year (Xyoo Tshiab) and Sky Signs in Birth and Death

In Laos, on the 30th day of the twelfth month (tsiab peb caug) the Hmong finalize preparations to welcome the New Year through ritualistic ceremonies commencing at about

4:00 in the afternoon. It takes much preparing to celebrate our New Year. We have a big party for one or two or sometimes seven days only. -It is our national holiday. There is always a lot of food and drinking (Lee, personal communication:1988).

Midnight of the 30th day of the twelfth month is the beginning of New Year for the Hmong. For many of the farmers, it is the only time away from the fields all year and, therefore, the New Year's celebration is full of spirited festivities, blessing-giving and dynamic rituals. The Hmong also observe the type of "animal-year".

They listen to find out which animal is going to open the year. The year is named for the animal that cries out first, such as 'cow-year', 'lee-nyu-year' (similar to a hawk, or 'rooster-year'. Everyone in the village gathers together in one house to listen to find out what animal makes the sound. If it is the cow that bellows first, then the coming year will be good, but there will be hunger, since the cow eats so much, . . . If it is the bird, the lee-nyu, that cries out first, then the coming year will bring trouble, sickness, death and other misfortunes. • If it is the rooster that calls out first, then the coming year will be called the rooster-year, and it will be a good one. A rooster year is good because the rooster is one that leads the sun into the world each day (Vang & Lewis 1984:159).

The New Year, although based on the calendrical cycle of the moon, is a festival that welcomes the new sun. Even today in the United States, the Hmong celebrate this important holiday between November 25th and December 25th depending on the probability of fair weather and the availability of a large facility to house the entire community.

Birth and death ceremonies are also tied to the Hmong understanding of the cyclical nature of the moon

and the sun. Although the birth of a child entails many ritualistic practices and taboos before and after birth not mentioned here, it is noteworthy that the Hmong "believed that the gestation period for a female child was nine months, while ten months were required for a boy" (Barney in Sutton 1984:11). In death, the Hmong acknowledge the sun as helpful in the travel of the soul. "The Hmong believe that the spirit of the dead person should depart as the sun sets, so that the soul will not come back often to make a nuisance of itself" (Anon 1981:43) •

### other Sky Phenomena

Rainbows are a fearful sign in the sky for the Hmong. Vang & Lewis (1984:93) write that "rainbow" is *zaj sawv* (dragon-standing up). One of my consultants was aware that there were Hmong folktales of "dragons in the sky" but, dismissed it as nonsense (Lee, personal communication:1988). Without mention of dragons, another consultant, Pa Ku, related that whenever a rainbow was seen

I was very sad and my mother told me not to look at it. We always know that when a rainbow comes many people would be dead. You know, much rains come before a rainbow and all the people that are at river die because water in river goes too fast. So Hmong people do not like rainbow. When I first came to united States I was in Michigan and I liked it because I never see a rainbow but, now that I am in Redding (CA) I see many rainbows and I am scared (personal communication:1988) •

Another sky sign, an eclipse (*dab noj hlis/lub hnuv* = spirit + eat + moon/sun), believed a threatening force in many cultures, is also a sign of fear for the Hmong. Though the Chinese, even prior to the 8th century B.C., could record and predict eclipses," they believed them caused by a dog or dragon, trying to eat the darkened planet, and attempted to drive the animal off with gongs and fire-crackers" (Brendon and Mithrophanow 1927:8). So too, when two consultants experienced an eclipse of the sun (presumed to be "sometime in 1965-66" at around "9:00 or 10:00 in the morning") (Lee, personal communication:1988), there was the continual sound of gunfire and noise throughout the mountain villages. Pa Ku shared what she remembered of her frightening childhood experience:

When I was about three, I was down at the river. Everything started to get dark. I looked at the sun, it was turning black. My mother call all of us to come home--hurry fast. She told us not to look at the sun, we must hide in the house. Many people shoot guns at the sun, they try to make the sun come back. Pretty soon the sun was not dark anymore. I don't know what happened (personal communication: 1988) .

Xang, too, recalled what happened; he added

To see what was happening to the sun, many people looked in a large bucket filled with water to see (the reflection) the sun. You could see better the dark sun (personal communication:1988) •

It is unclear to me why many of the Hmong chose to look at the eclipse through reflected water unless there was knowledge of harmful light or spirits(?) projected during an eclipse or possible cultural taboo as mentioned earlier by Pa Ku.

In conclusion, the Hmong, though their origins are not fully understood, have attempted to remain an independent and "free" people. So, too, their cosmology remains uniquely Hmong. The rugged life on the mountain slopes and hillsides have caused them to form what Westerners might call, extremely "subjective" cardinal directions to describe the world around them. Direction is evaluated by whether something is "up the mountain", or "down to the river".

The sun, the day, the stars and the sky are all part of a daily cycle that begins when "the sun comes through the door".

The moon, however, appears to be the most important sky sign for the Hmong. Not only is the moon's cycle a daily calendar-keeping device but also determines the date set for the most important national holiday, the New Year. Calculated differently for males than for females, the moon cycles also determine the length of human gestation.

Finally, some sky signs are not pleasant--such as rainbows and eclipses and there are many taboos surrounding the appearance of these unexplainable phenomena for the Hmong.

## Notes

### Acknowledgments

Research in Hmong astronomy was extremely difficult in that, except for folktales and sayings from Grandmother's Path, Grandfather's Way (Vang & Lewis:1984) and a few tidbits found in Hmong creation stories (Johnson:1985, Mottin:1981), virtually nothing had been written specifically on Hmong ethnoastronomy. I am indebted, therefore, to the following consultants and interpreters for their friendship, time, enthusiasm, and patience with my many (sometimes absurd) questions:

"Grandma" Sia Yang  
three of her sons: Xang Lee, Chai Lee and  
Tong Ly  
daughters-in-law: Pa Ku Lee, Mai Lee Yang

While this paper is by no means a conclusive discussion of the cosmology of the Hmong, it represents a beginning investigation of things of the sky. I acknowledge the many linguistic differences between the White and Blue Hmong dialects (see: Bliatout, et al 1988:14) and note that my consultants and interpreters may not exemplify the mainstream of White Hmong culture either in their homelands or in this, their adopted, country (Vang, personal communication:1988).

1. Many sources say this, but there is some debate. In usage, Hmong use the term "Hmong" (or "hmoob") as follows:

haiv hmoob = Hmong of another clan = Hmong  
people  
peb hmoob = we Hmong  
Hmoob dawb = White Hmong

"Hmong" refers to the people who consider themselves to be Hmong (as opposed to Chinese, Mien, etc.). It is not always translated as "free" in the usual sense, nor it is clear who originally translated "hmoob" as "free" (Vang & Lewis, personal communication:1989).

2. The Lao language, however, rather than Hmong, was used for all education classes.

3. One notable exception regards the N/S orientation of the house. If a Hmong family decided to reside in a flatland or non-mountainous area, as happened often during the Vietnam War, the front door of the home was orientated east. (Lee, personal communication:1988).

4. "tuaj" can mean "to come" (to a place other than home), or to grow or sprout (as horns, feathers or hair) (Vang & Lewis, personal communication:1989).
5. Nyiajpov Lis, an Australian Hmong, has written some novels using this orthography for nhub, but the usual way is with the "n" first, spelled hnuh (Vang & Lewis, personal communication:1989). Author's note: All of my local consultants preferred to spell their word for sun, nhub, therefore it was used exclusively throughout the text.
6. When speaking of the "sun", the Hmong use the classifier lub preceding nhub (sun); nhub by itself generally means "day" (Vang & Lewis, personal communication:1989) .
7. Xang Lee prefers to substitute lub nhub (sun) here for ntuj (sky). His change suggests, "the sun can never equal the moon" (personal communication:1989).
8. This term is also the same word used to describe the "subsiding" waters of the Mekong a few days after heavy rains (Lee, personal communication:1989).

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## Evidence for Pre-Columbian Animal Domestication in the New World

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The criteria traditionally used to determine animal domestication were proposed by Galton (1865:134,136) and are: (1) economic usefulness to man; (2) the ability to breed freely under confinement; and (3) the ease by which they are tended (tameness). Of these, captive breeding is crucial and will be used in this study, although usefulness is also important. Tameness is not vital to domestication and may be impossible to prove, as in the case of apiculture, where the animals cannot be safely handled.

Here we will discuss seven animals domesticated in the New World before European discovery. The dog, "llama", guinea pig, turkey, Muscovy duck, stingless bee, and the cochineal insect comprise the list of known Pre-Columbian, New World animal domesticates. We will present and evaluate the evidence, both archaeological and documentary, for domestication of these seven animals, including bone morphology; associated paraphernalia of domestication, such as stone corrals, sacrificial burials, pottery, figurines; and the writings of European conquerors, explorers, naturalists, missionaries, ethnographers, and the native peoples themselves.

### Domesticated Dogs; Canis familiaris

There is no question that the dog was found domesticated in the New World at the time of European discovery; the archaeological and documentary evidence is conclusive (Colton 1970; Landa 1566 - Tozzer trans. 1941; Lawrence 1971; Olsen 1976, 1985; MacNeish 1966). Questions arise, however, as to whether the dog was domesticated in the New World independently of the Old World, or was introduced into the New World already domesticated, or even was originally domesticated in the New World.

At the present time, the earliest dates of domesticated dogs in the world come from North America, at Jaguar Cave in Idaho, with radiocarbon dates of 9500 BC and 8400 BC (Lawrence 1971:43). Of the Jaguar Cave material, Olsen (1985:31) says:

One would not expect to find these early dogs in a locality so far south as the Jaguar Cave rock-shelter without finding remains in sites closer to the Bering Strait. Finding the remains was due to the discovery and excavation of a rock-shelter site; less inviting sites, as yet unknown, between Jaguar Cave and the Bering Strait may, of course, hold equally important early dogs.

Remains of another early domestic dog were found at Ventana Cave west of Tucson, Arizona in a layer associated with the Chiricahua-Amargosa II culture complex and a radiocarbon date of 9500 BC (Colton 1970:153). There is some question about the context of that date. Haury rejects the antiquity of this date and suggests that this dog is probably associated with the Hohokam culture a thousand years ago (1950:159).

In the period between 1932-1953, twenty-eight more or less complete short faced wolf Canis Lupis familiaris skulls were found north and west of Fairbanks, Alaska, associated with a radiocarbon date of 8,000 BC. They have the closest morphological appearance to, and appear to be the forerunners of, contemporary domesticated Eskimo dogs (Olsen 1985:22). Olsen (1977) has discussed the possibility that the dogs were domesticated from the small, short faced Chinese wolf.

Early evidence that dogs were used as food comes from the Tehuacan Valley, at 6500-4900 BC (Flannery 1967:168). At Colima, pottery figurines of dogs holding corn cobs in their mouths, ca. AD 600, may indicate that the dogs were fattened on corn before being eaten (Burleigh and Brothwell 1978:359).

Dog bone heads were found at the Awatovi site (Olsen 1976:102,104). It is virtually impossible to identify characteristics of domestication from a carved bone. It must be assumed by the association with known domestic dogs and carved bone. Dog bone was also used in sacrifice (Landa 1566 - Tozzer trans. 1941:203).

### **Camelids; the "Llamas"**

Domesticated camelids are found throughout the Andes, parts of Central America and western Patagonia (Earle 1961:46-47). The llama, alpaca and vicuna all derive from the wild guanaco (Kenworthy 1975:46). The four varieties will be collectively referred to as "llamas" in this paper wherever that term is enclosed in quotes.

Evidence of "llama" domestication occurs in the Puna of Junin, central Peruvian highlands (Wheeler Pires-Ferreira, et al 1976:489). Remains in Level 4, relatively dated between 4200 BC and 2500 BC, show the change in bone morphology associated with the shift from wild to domesticated "llamas". Examination of camelid bone morphology from deposits in the Atacama Desert show the gradual development of the "blue rim", a thick layer of collagen on the bone surface, visible under microscopic study. This is a characteristic of domesticated "llamas" (Pollard and Drew 1975:229-304), and indicates that "llamas" were gradually domesticated during the period between 4200 BC and 2400 BC.

A stone corral with twenty centimeters of llama dung in the bottom was encountered adjacent to a ceramic workshop in the Moche' Valley (Porzorski 1976:130). One layer of dung 3 meters thick contained plant material (maize stalks, cobs and leaves, and algarrobo seeds) suggesting that crop-waste was fed to "llamas" (Shimada and Shimada 1985:15). Modelled clay figurines and vessels depicting llamas carrying packs and figurines of copulating llamas wearing harnesses suggest that llama breeding was controlled (Shimada and Shimada 1985:5. fig.1a).

Aside from their use as food, domesticated llamas were also used to transport cargo (Prescott 1843:806) and copper ore (Shimada and Shimada 1985:15), the fleece of all varieties was used for production of wool (Prescott 1843:807), in some areas "llamas" were milked (Shimada and Shimada 1985:3), and were sacrificed in religious ceremonies (Meggers 1966:149; Porzorski 1979:167; Strong and Evans 1952:31).

In 1532, members of the Pizarro expedition noted huge herds of llamas. Miguel de Estete wrote of llamas kept in herds and used for food in 1534. De Cuenca recorded Indian testimony about large herds in Northern Peru during his journey of 1566-1567. He spoke of eight corrals made of mud and stone for butchering and sacrificing the llamas (Shimada and Shimada 1985:17). Fully domesticated llamas had spread throughout the lowlands by 700-600 BC (Shimada and Shimada 1985:3).

### Guinea pig; the Cavy; Cavia porcellus

The guinea pig, or cavy, is indigenous to the Andes. Remains of the earliest known fully domesticated form were recovered from Pikimachay Cave in the highlands of Peru, ca. 5000 BC (Stahl and Norton 1987:385). The guinea pig was found in the Culebras Complex ca. 1800 BC

(Lanning 1967:63), and in association with monumental architecture at Huaca ca. 1300-600 BC (Shimada and Shimada 1985:8). Guinea pigs were also found in association with human burials in the Ayalan cemetery in Ecuador, as were Muscovy ducks, dating to ad 500 (Hesse 1980).

Meggars (1972:123) notes that guinea pigs were raised inside houses, and that they began to play an important role in the economy at an early time (Meggars 1972:46). Due to their high fertility and ease of maintenance, they ranked with sea food as the most important source of protein in the diets of the coastal Peruvians (Stahl and Norton 1987:385). Throughout the Andes, guinea pigs were most commonly kept as a food source, although they were also used as sacrificial offerings, an antidote to sorcery, and for the diagnosis and cure of illness (Bolton 1979:263-239).

#### Muscovy Ducks; Carina moschata

In the Ecuadorian lowlands, Muscovy ducks were domesticated between 700 BC and 600 BC, called the "Historic" Period, and were associated with burials in the cemetery at Ayalan at AD 500 (Hesse 1980).

The 1987 discovery of an intact Moche' warrior-priest tomb at Sipan, Peru, dated to AD 290, gives us a unique look into the culture of this Andean civilization. Included in the adornment of the warrior-priest were mirror image ear ornaments believed to depict a stylized Muscovy duck (Alva 1988:546-547).

Meggars (1966:123) mentions a large duck that was kept inside houses in Ecuador. The ducks were used for a number of purposes. Their meat was used as food--early explorer Cieza de Leon mentioned a duck raised in coastal Ecuadorian houses for food, as a sacrificial animal, and their dried meat made an aromatic powder (Stahl and Norton 1978:386).

#### Turkeys; Meleagris gallopavo

Turkeys are found throughout North and Central America. Domesticated turkey bones appear in the Tehuacan Valley sequence early in the Palo Blanco phase, ca. AD 180. This is the oldest reliably dated evidence for the domestic turkey in Mesoamerica (Flannery 1966:175).

MacNeish (1966:290) points to the hybridization of turkeys, as evidence by bones found at Tehuacan, as proof

that the turkey was domesticated. Bones found in the Northwest of Mexico and the Southwest United States, with earlier dates, as well as genetic similarities among present day domestic and wild turkey populations in the "Southwest United States, indicate that domesticated turkeys spread from the greater Southwest to Tehuacan" (1966: 19-5) .

Analysis of coproliths, radiocarbon dating ca. AD 180, from the Tehuacan Valley shows the presence of turkey feathers and bees in the diets of the people living there (Callen 1966:273, 265). Turkey bones found in the basin-valley sites in the Northern Sierra suggest that the bird was originally taken from its mountain habitat and penned in the lower valley villages (Di Peso 1977:7) .

Three varieties of turkeys were found at Casas Grandes, ca. AD 250. They were: 1) the Small Indian Domestic, most popular at the New Mexico Tompiro pueblos in the Rio Grande drainage; 2) the Large Indian Domestic, resembling birds from east central Arizona; and 3) the Tse Tala, which was a very large bird (Di Peso 1974:602). Evidence of egg shells and bones suggest that the Small and Large Indian Domestics were hybridized (Di Peso 1974:603) •

The earliest naturalist to give an account of the domestic turkey was Oviedo y Valdes. Slightly confused, he described turkeys that he had seen in the West Indies soon after the Conquest, "Whither they had been brought," he said, "from Spain" (Di Peso 1535:306).

Earlier records of turkeys include the lists of food served by Moctezuma to Cortes and his men in 1518 (Anderson and Dibble 1978:19; Prescott 1847:89). Prescott (1847:101) records that the yearly expenditure of the Aztec king Tezcuco included 8000 turkeys. Tepexi received tribute from his people in 1537, to give to Cortes, that included turkeys (Gorenstein 1971:341). Di Peso (1974:602) mentioned the use of turkeys for trade, plumage, blood for decoration and religious ceremonies in Casas Grandes, as well as grave goods.

#### Stingless Bee; Melipona beecheii

Stingless bee apiculture occurs throughout much of the New World--Mexico, Yucatan, Central America and the Amazon Basin as far south as Sao Paulo (Nordenskiold 1929:177;£ig.12), but not in Peru. Darwin (1859:225) listed the stingless bee of Middle and South America as "Melipona domestica", due to the fact that it was so often found domesticated, although it is now termed

Melipona beecheii.

There is a great deal of documentary, but little direct archaeological, evidence of the domestication of the stingless bee. As mentioned above, an analysis of coproliths from the Tehuacan Valley, ca. AD 180, showed the presence of bees in the diet, although it cannot be proven that the bees were kept in hives (Callen 1966:265).

Sahagun (1547-69 - SeIer trans. 1829:403-405, 406-411) states that wax of the bees was used by goldworkers employing the lost-wax casting method. They made "a mold by means of charcoal and wax, applying it to designs, and in this manner fuse gold and silver." When the wax was carved into the image to be cast, "they boil the wax and mix it with white copal, by which it becomes very compact. Then they clarified it by filtration, in order that the impurities . . . may be well settled out. When the wax is prepared. . . they apply it on the charcoal." The wax-coated carving was then dipped in liquid clay and burned to remove the wax.

Easby (1966:73-75) mentioned the casting of gold using a lost-wax casting method, employing the wax of stingless bees by goldworkers of Columbia, and somewhat later in Panama and Costa Rica in the final centuries BC. Casting was never common in Peru, where the stingless bee does not occur (Plazas and de Saenz 1978:37).

The earliest documentary evidence for domestication of the stingless bee came from the Mayan Codex "Troano" (Afionymous, ca. AD 1178). The Troano is a calendrical almanac listing the times for various farming activities, including the collection of wax and honey. It is comparatively dated at roughly AD 1178 (Thompson 1950:24ipl. Illc.) by cross-referencing with the Dresden Codex, which mentions events for which dates are known. In 1530 Alonso de Avila marched into southwestern Yucatan and seized the beehives of the region and redistributed them among his men, as a method of impoverishing the natives (Blom 1936:72). Clavigero (1780:107) mentioned the antiquity of the stingless bee in the Yucatan, and its importance to the economic system of the region.

The stingless bee was domesticated simply by cutting a 2-3 foot section of hollow log, drilling a flight hole, then stopping the ends with plugs made of clay, or stones mixed with clay, that could be removed to collect the wax and honey or propagate the hives (Schwarz 1948:144). New hives were created by the simple expedient of separating a part of the brood comb, and placing it and few old bees in a new hive (Huber 1839:22).

The hives were often made of earthenware and ornamented with the heads of men or monsters, with the flight hole represented by the mouth (Schwarz 1948:145). Explanations for this ornamentation ranged from the erotic--to bring good luck, to the pragmatic--to show which side is up when the hives are moved (Redfield 1934:48) ..

The stingless bee was used for a variety of purposes: wax; honey; wealth; status; (Schwarz 1948); as indemnity for crimes (Landa 1566 - Tozzer trans. 1941:98); and as medicine to treat vomiting and cramps (Nordenskiöld 1929:170) .

### Cochineal Insect; Oactylopius coccus

Swartz (Meighan, et al. 1958:Table 7; p. 145) provides a compilation of animals throughout the world that have been domesticated and includes the cochineal. It was bred and produced a dye.

Examples of fine weaving of llama wool, colored with yellows, blues and reds date back as early as the Late Formative Period, ca. 700-500 BC (Murra 1962:710-728). It is possible that the red dye was cochineal dye, although it would be difficult, if not impossible to ascertain provenance of dyes in archaeological settings.

The red cochineal dye was extracted as a tribute item as early as 1511-1512 among the Toltecs (Oonkin 1977:21) .

The cochineal was raised on a variety of cactus, called the opuntia, described by Oviedo y Valdes (1526), as well as other, later, Spanish historians. Nopals, or opuntias, were cultivated, then seeded with pregnant cochineals, which laid eggs that matured into adult insects, which were then harvested (Donkin 1977:16). Because the cochineal, whether domestic or wild, is a parasite on the nopal, the cactus must be "rested" every third to fourth year (Alzate 1777-1794:85).

The harvested cochineal was treated in a variety of ways, all culminating in a silvery powder, that would, when properly processed, produce a deep red dye. So valuable was this dye, that as early as 1548, the cabidlo of Tlaxcala., Mexico, instructed officials to supervise the trade, as it was too easy to adulterate the product by the addition of such things as ash, sand, or inferior quality dye (Lee 1948:457).

Called niin by the Maya, the cochineal made a



medicine used in the treatment of swollen testicles and sores on the tongue caused by smallpox (Roys 1931:125,164), and for the treatment of burns and broken limbs (Oviedo y Valdes 1526:99).

## Summary

There were seven domesticated animals kept in the New World before European discovery. All but the cochineal may be demonstrated both archaeologically and with documents. The dog dates to 9500 BC at Jaguar Cave, Idaho (Lawrence 1971). The llama dates to 4200-2500 BC in the Central Peruvian Highlands (Wheeler Pires-Ferreira, et. al 1976). The guinea pig dates to 5000 BC in the highlands of Peru (Stahl and Norton 1987).

The Muscovy duck dates to 700-600 BC in the Ecuadorian lowlands (Hesse 1980). The turkey dates to AD 180 and probably came from the greater Southwest (MacNeish 1966). The stingless bee dates back to at least AD 180, at least, and is spread throughout Central and South America (Callen 1966). The cochineal is known historically, but there is no conclusive archaeological evidence for it (Donkin 1977).

Acknowledgements: The senior author would like to thank Dr. B.K. Swartz, Jr., without whose assistance this paper would never have been written. I also thank Dr. Ron Hicks, who first got me interested in the subject, as well as Dr. Raymond Thompson, who took time from his busy schedule to track down references for me. This paper was read at the Central States Anthropological Society meetings, March II, 1989, University of Notre Dame, by the senior author.

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## Women in Anthropology

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Women have long held a place of prominence as professionals in the field of anthropology. To the general public the names Margaret Mead and Ruth Benedict are practically synonymous with science. Ironically, however, women as subjects of inquiry have not held such status throughout most of anthropology's history as an academic discipline. This neglect, both in theory and in the fieldwork which is the hallmark of anthropology, has been addressed in recent years. A new generation of women anthropologists has been building on the legacy of those who preceded them by including women's experience in the configuration of culture as a legitimate sUBject worthy of inquiry and analysis. An historical survey of the treatment of women as a research problem, along with a sampling of the work of female anthropologists, particularly as it pertains to this topic, offers an overview of the contribution of women, both as professional and as sUBject, to the science of anthropology.

During the formative years of anthropology, this new science in "accepting the psychic unity of mankind", "was kinder to women", making them "more welcome than in other professions" (Mead & Bunzel 1960:5). In an era when few women worked outside the home in a professional capacity the discipline was, of course, dominated by men. The women drawn to anthropology with its emphasis turning to fieldwork and the rigors inherent in it, were certainly uncommon women.

Matilda Cox Stephenson first began her work among the Zuni with her husband, but later returned after his death to do extensive research under the auspices of the Bureau of American Ethnology. She "paid especial attention to the activities of women and children, and was, indeed, the first American ethnologist to consider children worthy of notice" (Mead & Bunzel 1960:205). Stephenson, along with Alice Cunningham Fletcher, helped to organize the Women's Anthropological Society of America in 1885. The precursor to the American Anthropological Association, founded in 1879, was at that time restricted to men. In 1889 the two societies merged and in 1902 became the present American Anthropological Society (MacCormack 1981:101; de Laguna 1960:93-101).

Alice Fletcher was another early ethnologist who worked among the Indians. Her original interest was in Indian music and she spent many years among the Omaha, before the time of tape or record players, recording their songs by notation. For over twenty-five years she collaborated with Francis La Flesche, the son of an Omaha chief, and published the prodigious volume, The Omaha Tribe, in 1911. She may be considered America's first applied anthropologist. Commissioned by the government because of her extensive background with the Omaha, she supervised the distribution of reservation lands for that tribe and later for the Winnebago and the Nez Perce. She later formulated rules to be used with other tribes and wrote a treatise on Indian education in response to a congressional resolution (Mead and Bunzel 1960:227; Eggan 1968:126). In 1882, Fletcher became the first ethnologist to join the staff of the Peabody Museum at Harvard and "helped to set the course of anthropology as a discipline by emphasizing indigenous interpretations and meanings in her work" (MacCormack 1981:100; Eggan 1968:126) •

Elsie Clews Parsons was born into wealthy and socially prominent family, but chose her own path. Earning her Ph.D. in sociology in 1889, "she pioneered in new investigations on the effect of culture on women". Several years later she met Boas and turned to anthropology where she was able to abandon the pseudonym of John Main which she used as a sociologist to write about ceremonial chastity (Mead and Bunzel 1960:5). Her persistent interest in social control, "especially as it affected the role of woman", took her ethnographic research to the Pueblo Indian culture, a culture more demanding of conformity than her own. Her book, Mitla, Town of Souls, which presented her study of the informal techniques of social control, was written from the woman's perspective (Mead and Bunzel 1960:546-7).

Though the women drawn to the field of anthropology may have been uncommon, the subject of women, especially relations between the sexes, was commonplace in Victorian British anthropology. The contemporary social concerns of the period influenced anthropological inquiry. "A highly visible and vocal feminist movement flourished at the time, making an issue of the status of women, 'challenging complacent assumptions about the timeless quality of women's roles, (and rejecting the notions that) marriage, the family, and sexual roles' .belong to the natural conditions of men or are dictated by law of nature" (Rogers 1978:125; Fee 1973:23=4). A study of the past was undertaken, a study of the role of women in 'history', in order to ascertain the 'proper' role of contemporary women (Fee 1973:25).



Anthropologists at the time worked from an evolutionary framework and believed that by studying the present day "primitive" societies, which were assumed to be in earlier stages of evolution they could reconstruct the process of social evolution (Rogers 1978:125). These were not, however, ethnographic studies, but consisted instead of reports from missionaries and explorers to which logic, deductive reasoning, and "considerable imagination" were applied to arrange in sequence the development of civilization to its high point which was, of course, believed to be that of middle-class Victorian society (Rogers 1978:125). "The Victorians saw women in non-Western societies as oppressed and servile creatures, beasts of burden, chattels who could be bought and sold, eventually to be liberated by 'civilizations' or 'progress,' thus attaining the enviable position of women in Western society" (Etienne and Leacock 1980:1).

Bachofen, in Das Mutterrecht, provided a theory of "a continuing struggle between male and female as the central theme in social evolution" and envisioned a prior stage of promiscuity which was replaced by a social matriarchy and eventually the patriarchy of the present day (Fee 1973:27). His theory that women at one time overthrew men in an Amazonian revolt to form a matriarchy did not fit in with the contemporary Victorian view of the "eternal [passive) nature of women" and the authority of the patriarchal family (Fee 1973:27-8). Yet his argument that the modern Victorian family was the culmination of along evolutionary "struggle against the crude desires of nature" gave his theory some plausibility among such contemporary theorists as McLennan, Lubbock, Spencer, and Morgan who reconstructed his model to suit their views as well as those of their "middle-class audience" (Fee 1973:28).

Lewis Henry Morgan, an American anthropologist, believed that society was first organized on the basis of sex and that women had no productive function in society. He did not reject Bachofen's theory of an earlier matriarchy and though he believed the monogamy of the present stage "to be far superior to the original stage of "promiscuity", he saw the transition to patriarchy as having a very "unfavorable influence on the position of women" (Fee 1973:32). He predicted an eventual equality of the sexes as the next stage in the evolution of the family. Believing as he did in the emancipation of women, Morgan, in fact, donated a large amount of money to the University of Rochester for the furthering of female education (Fee 1973:33-4). Perhaps because he was an American (or perhaps because of his sympathies with the status of women), Morgan's views held little esteem among British anthropologists (Fee 1973:32).

Herbert Spencer, on the other hand, preferred the status quo. He believed that "since evolution had placed women in the home, there they should stay" (Fee 1973:34). He used anthropological theory of that time to support his opinion and pointed out to his audience that women in primitive societies had received harsh and cruel treatment and that present civilization brought about an "improvement of women's status implied by limitation of their labors to the lighter kind" (Fee 1973:37; Spencer 1966:724). The pedestal upon which wealthy middle-class Victorian women were placed was viewed as the pinnacle of civilization for women and though men were firmly in control, women were protected and spared the savagery of the primitive state (Fee 1973:37). As civilization evolved, bringing the 'natural' male lust under control, women's status was improved and they should be grateful (Rogers 1978:126). Thus the status of women was measured in moral terms with "current social arrangement" being the culmination of "moral evolution from savagery to civilization" (Fee 1973:24; emphasis added). In this manner, evolutionary anthropology provided a justification for the status quo of the position of women in Victorian society (Rogers 1978:125).

As twentieth century anthropology took a different turn, with "armchair theories" of social evolution being replaced by ahistorical studies of particular societies with cultural relativism and fieldwork becoming its hallmarks, interest in female status largely disappeared along with a decline in the feminist challenge in the societies which were involved in anthropological inquiry. Issues of female role and status were generally supplanted by a focus on women's suffrage (Rogers 1978:126) •

With few exceptions, anthropology, from the turn of the century until late 1960s, has "treated women as at best peripheral members of society" (Rogers 1978:126), in the same way as the Nuer's cows (Ardener 1972:140; 1975:4). This view is well illustrated by Evans-Pritchard in his essay "The position of women in primitive society and our own": ".men are always in the ascendancy, and this is perhaps the more evident the higher the civilization;". ".the adult primitive woman is above all a wife, whose life is centered in her home and family" (Evans-Pritchard 1965:54,46). He "questions whether the sUbject of female status may even be considered a serious research problem, at least in the social sciences" (Rogers 1978:123), that is an "imponderable" and "fundamentally a moral question" (Evans-pritchard 1965:42,56; emphasis added). This assumption has been made in "innumerable anthropological texts, monographs, and theoretical works", and ahs

generally "been accepted as a given, hardly requiring substantiation, justification, or even explicit statement" (Rogers 1978:123). Indeed, the literature of twentieth century anthropology reflected this belief with data on women being relegated to descriptions of kinship, marriage, and domestic life (Tsing and Yanagisako 1983:516; Strathern 1987:278; Mukhopadhyay and Higgens 1988:465; Rogers 1978:145), inferring "that women everywhere do little but marry men and run" "households" (Rogers 1978:145). The male representation of a society was presented as the entire reality for the group (Rogers 1978:126; Reiter 1975:12) with the "assumption of a fundamental unity of male and female values in any given society. unquestioned" (Rogers 1978:131).

There were exceptions to this rule, however. Women such as Phyllis Kayberry, Margaret Mead, Ruth Benedict, and Audrey Richards and men such as Robert Lowie and Oscar Lewis documented "for various cultures the participation of women in all spheres of social life" (Etienne and Leacock 1980:1). In 1939 Kayberry wrote Aboriginal Women: Sacred and Profane, a study which gave special attention to the status of women. Her 1952 Women of the Grassfields was a study done at government request ove-r- concern for the underpopulation and economic underdevelopment of the Bamenda area of West Africa. Suspecting a correlation among social factors such as high infant mortality and women's status, Kayberry's assistance was requested due to her prior work with the status of women Australia. Kayberry pointed up the discrepancy between the 'ideal' of social organization and its actual functioning. In Bamenda, though land is owned by male chiefs, women actually exert 'real' control of the land by their right to crop production (MacCormack 1981:102; Forde in Kayberry, 1952:v-vi).

Meads pioneering research on the female gender (1) stressing the wide cross-cultural variability of sex-role definition showed that cultural constraints played a larger part in female temperament than did biology, work which also argued against neo-Freudian views of the essential passivity of women (Sanday 1980:340; Rogers 1978:128; Kessler 1976:9; Leacock 1981:1). Ruth Benedict, in her work on the relationship of culture and the individual "presented materials that contradicted sex-role stereotypes" (MacCormack 1981:100; Leacock 1981:9-10). Audrey Richards in her book, Chisunqu (1956) not only showed how young girls, through ritual, could be molded to meet a society's expectations of a woman, but at the same time pioneered the study of symbolism (Kessler 1976:vii; La Fontaine 1972:xv). Lowie included the activities of women in his ethnography of The Crow

Indians (1943) and wrote a chapter on women in Primitive Society (1935) (MacCormack 1981:100). As a male anthropologist Oscar Lewis was most exceptional in that realizing his inability "to penetrate the world of women and included that dimension", he used tape recorders to permit women to tell their own stories (Kessler 1976:9,vii).

The revival of the feminist movement in the 1960's brought a resurgence of interest in the spheres of women cross-culturally. Feminist interest in discovering the origins and development of sexual asymmetry (defined as male dominance/superiority and female subordination/inferiority) required the dimension that only anthropology could supply: cross-cultural data through space and time and theories of social evolution (Kessler 1976:7; Reiter 1975:11). The monumental task of determining whether male dominance was universal across time and cultures, as well as the "key determinants" to women's status, was eagerly taken up by many women anthropologists. Answers to these "key universals" were expected to give direction for social change in the perceived universally inferior status of women. A search of the ethnographic record provided a dearth of information on women such that it constituted "a genuine deficiency" which "has led to distorted theories and impoverished ethnographic accounts" (Rosaldo and Lamphere 1974:v-vi).

The initial response in the literature was an outpouring of attacks charging male bias in the discipline (Reiter 1975; Slocum 1975; Etienne and Leacock 1980; Ardener 1972, 1975; Rosaldo and Lamphere 1974; Rosaldo 1980; Leacock 1981; Rohrlich-Leavitt, et al 1975). Such bias has been attributed to male ethnographers or women trained by men who, working with male models of society, deemed the activities of women unimportant. In addition, there has been a long-standing assumption in anthropological fieldwork that women generally make poor informants. Therefore, the data that had been obtained on women was provided almost exclusively by male informants (Quinn 1977:183; Rogers 1978:126; Ardener 1975:1-3; Slocum 1975:37; Scheper-Hughes 1983:110; Milton 1979:40,44; Reiter 1975:13-14; Rohrlich-Leavitt, et al 1975:110-11; Friedl 1975:279), with total analyses failing to include one half the people (Ardener 1975:3), the social realities of groups under study were being seriously distorted (Rogers 1978:144). The common assumption that both genders perceive their own culture and their own gender's place in it in essentially the same way, and that "men and women share a common culture on similar terms" (Chinas 1973:2; Ardener 1972:140-41) has "profound empirical and

theoretical implications" (Rogers 1978:131).

Just as the first anthropologists challenged the assumptions of superiority of Western civilization, a new generation of anthropologists, mainly women, were challenging some cherished assumptions about sex and gender long held in society and in the discipline of anthropology (Atkinson 1982:237-8). "Feminists were asking the kinds of questions about ideologies and models that anthropologists recognized. In short, they gave excellent anthropological advice" (Strathern 1987:279).

Rather than the lone, individual voices of the early anthropologists who included the spheres of women in their studies, the work of the many women anthropologists of recent years may be heard as one voice in the quest to restore women to view by placing them at the center of inquiry. The task itself, however, "speaks in many voices" as the researchers involved come from different motivations, as well as the diverse perspectives which constitute both feminist and anthropological scholarship (Rogers 1978:137-8; Strathern 1987:284-5) •

A subdiscipline known as the anthropology of women or feminist anthropology has been created in which researchers have been gathering new data from the field and reviewing the old, as well as reexamining the models that have been used to generate hypotheses and analyze data on social systems (MacCormack 1981:102). Some have worked under the assumption of a universal male dominance while others have worked to refute the idea of women as passive and powerless, and see women not as "pawns", but as actors with their own agendas (Stack, et al 1975:1472; Atkinson 1982:250; Rosaldo and Lamphere 1974:9).

As is characteristic of new fields of inquiry, a deluge of literature has appeared since the early 1970's. The numerous and largely disparate studies represent nearly all the subdisciplines in anthropology and as many theoretical positions. Diverse aspects of women's lives in virtually every culture have appeared in the ethnographic literature (2) (Quinn 1977:181; Strathern 1987:285; Mukhopadhyay and Higgs 1988:461). "This literature has profoundly affected anthropology, challenging basic tenets and theories as well as the reliability and objectivity of traditional ethnographic data and methods" (Mukhopadhyay and Higgs 1988:461).

One of the first challenges posed perhaps best exemplifies how valuing rather than diminishing 'women's work' may change or offer a more complete picture. Though

the research of the 1960's overwhelmingly showed that it was the gathering and collecting of small game by women that supplied the majority of the population's subsistence, scholars insisted that it was the hunting of large game by males that was most instrumental in the transition from hominid to human (Rosaldo 1980:410). Sally (Linton) Slocum challenged the emphasis given to hunting in this widely accepted theory as presented by Washburn and Lancaster in "The Evolution of Hunting" (1968), in which they posit that "in a very real sense our intellect, interests, emotions and basic social life--all are evolutionary products of the success of the hunting adaptation" (1968:293). She offered an alternative theory of human evolution, "Woman the Gatherer" (1975), which places the female in "an active and possibly dominant role in the development of human intelligence and culture" (Stacey & Thorne 1985:305). By combining data from the fossil record, primate ancestors, and contemporary hunting and gathering groups, Slocum suggests that it was the innovations required for gathering while simultaneously caring for and socializing off-spring that were the dominant factors in the transition. She insists that the activities of gathering and the socialization of children "required cooperative and communicative skills as complex as those required for hunting" and that the hunting of big-game likely came much later in cultural evolution, after the increase in brain size (Reiter 1975:16-17; Rosaldo and Lamphere 1974:7; Slocum 1975:43-46).

Tanner and Zihlman further developed the theory and brought forth evidence to support the view that "the critical hominid innovation was the gathering and sharing of plant food". They suggest that the mother-offspring bond was primary and that an important selective agent may have been the preference by females for non-aggressive mates as they would be least disruptive in the mother-centered unit (Tanner and Zihlman 1976:608; Stack, et al 1975:149). This view contrasts with the traditional 'man the hunter' theory which emphasizes male technology, aggression, and dominance in the provision of subsistence and protection to the weak, passive and dependent females with whom they are assumed to be attached in a sexual pair-bond (Tanner and Zihlman 1976:608).

In addition, Patricia Draper refutes the common representation of hunting being more highly regarded than the 'women's work' of gathering which is viewed as boring and repetitious [and perhaps initially requiring less brain development] (Service 1966:12). In her work among present day hunter-gatherers, the !Kung Bushmen, Draper finds the return of a gathering expedition greeted with

as much celebration as men returning from the hunt. She also states that the task of gathering "demands as much ability to discriminate among hundreds of different plant species at different stages of their life cycle" while also collecting "information as to the 'state of the bush', crucial to band movements and hunting decisions" (Quinn 1977:184; Draper 1975).

These studies have been seen as exemplifying the critical need to reanalyze the concepts of cultural and biological evolution, as well as serving "as a corrective to the bias of mainstream anthropology" (Reiter 1975:19). Such bias was also challenged in the ethnographic method as restudies by women anthropologists who listened to women in their work discovered omissions leading to distortions in past studies.

In comparing the earlier work by male ethnographers to the studies of aboriginal societies in Australia done by Jane Goodale (1971) and Phyllis Kayberry (1939), Rohrlich-Leavitt, Sykes and Weatherford find the depiction of aboriginal women as "profane, ritually unclean, and economically unimportant", to be quite different from what Kayberry and Goodale noted. Their data show that women "play a central role in subsistence, perform their own important rituals, and are treated by men with respect and dignity" (Quinn 1977:184). Kayberry questions "whether male anthropologists are correct in reporting that Australian men and their rites represent the sacred element in the community, in view of her observation that Australian women do not seem to 'be cognizant of the fact and accept it'" (Rogers 1978:144; Kayberry 1939:230). Annette Weiner's restudy of the Trobriand Islanders offers a new theory of social organization by demonstrating the significance of women's wealth and exchange which was overlooked in Malinowski's classic ethnography because he deemed "'women's business' unworthy of careful study" (Weiner 1976:11,29; Atkinson 1982:255; Rapp 1979:501-2). Jean Briggs, in her study of the Eskimo, differs with earlier ethnographers by denying that Eskimo men devalue the women. She maintains that men and women respect each other's expertise in the different and complementary roles each fulfills (Quinn 1977:184; Briggs 1974:276).

New ethnographic work and analyses by women anthropologists also suggested androcentrism (male bias) in the interpretation of the ethnographic record. Elizabeth Faithorn disagrees with the traditional treatment by anthropologists of female pollution in Highland New Guinea. Among the Kafe, it is not women, themselves, who are regarded as polluting, but rather, certain reproductive fluids like menstrual blood or

semen. Men may pollute as well. Faithorn believes ethnographers have disregarded taboos regarding male sexuality because they have conceptualized women, rather than the excretions, as polluting agents (Faithorn 1975:138-9; Quinn 1977:184). Leacock believes that ethnographers may be seeing sexual asymmetry where none exists, noting the common interpretation of women's isolation in menstrual huts as exclusion from society "while men's parallel isolation in men's houses is interpreted as the exclusion of women from the men's world" (Leacock 1972:40).

The lack of sufficient data and the misinterpretations of data collections resulting in distortions of the ethnographic record have been blamed on the failure to ask the right questions. This failure, it has been charged, is due to the traditional androcentric models which have failed to accurately account for the variety and importance of women's roles in many cultures. Yet as some feminist anthropologists set out to rectify the record, others charged that female bias in the fieldwork led to equally distorted ethnographic accounts (Milton 1970:47; Strathern 1981:669; Scheper-Hughes 1983:110). There was a tendency among some ethnographers to record what women in other societies were not, according to feminists standards, rather than what they were (Atkinson 1982:254).

Feminist anthropologists also took each other to task over other inconsistencies and contradictions. The major analytical construct of a universal male dominance was shown to be invalid if the ethnographic accounts upon which the concept was based were male-biased as well (Scheper-Hughes 1983:111; Milton 1979:45). The assumption of a universal 'womanness', a common experience as women, was seen as naive at best and ethnocentric at the worst (Mukhopadhyay and Higgs 1988:462; Strathern 1981:670-73; Milton 1979:47). Such universal assumptions resulted in a projection of feminist's own cultural conflicts and priorities onto other cultures in other times and places (Rogers 1978:136-37; Rapp 1979:571). Conceptual errors of this sort were uncovered in part by the extensive fieldwork undertaken which soon brought to light that the notion of male superiority was not universally held, and was often contradicted; nor was there a universal conceptualization of a hierarchy between the sexes (Milton 1979:53). Studies also revealed the concept of motherhood as being a universally constraining factor further subjugating women to be more of a reflection of the feminist perspective of women in their own society (Rogers 1978:136-37).

If, then, the aim of feminist anthropologists was to



"correct the male bias in the field and revise the nature of anthropological inquiry" (Scheper-Hughes 1983:110), because prior work reflected the anthropologists' own culture (as in diminishing the importance of women), it would seem that they fell short of their mark by becoming ensnared in their own culture-bound assumptions. Such views were repeatedly exchanged in the literature over the past twenty years and has led to a maturing in thought and goals.

Universalistic theories as bases for cross-cultural comparisons have been replaced by "theories more restricted in scope" designed for particular types of societies or "applicable to a narrower range of lower-level phenomena" (Mukhopadhyay and Higgs 1988:486). The search for origins and 'key' determinants to women's status along with the entire concept of 'status' have been abandoned as ethnographic evidence has demonstrated women's status to be "multi-dimensional, measurable according to a variety of possibly unrelated scales" (Mukhopadhyay and Higgs 1988:486,466).

The female-centered thought of earlier work has shifted to a development of a "more fully 'gendered' understanding of all aspects of human culture and relationships" (Stacey and Thorne 1985:305). There has been a trend toward the examination of "gender as the basis of all social and cultural life, [and a] tracing [of] the significance of gender organization and relations in all institutions and in shaping men's as well as women's lives" (Stacey and Thorne 1985:306). Efforts are being made to develop a comparative framework to examine the concept of gender and sexuality which are seen as cultural constructs explaining a biological phenomenon (Atkinson 1982:246). The variability of such concepts and the extent to which they emphasize biology as an explanation for differences was a "problem thrust into the foreground of anthropological attention by Mead in 1935, but subsequently buried." (Ortner and Whitehead 1981:1,25; Atkinson 1982:245).

The renewed interest in gender studies by feminist anthropologists is based, in part, on the tradition among social scientists to view roles, in general, as social constructs, but binding the female role to biological characteristics (Atkinson 1982:245). Collier and Yanagisako assert that "social wholes" must be analyzed in order to question the "assumption that 'male' and 'female' are two natural categories of human beings whose relations are everywhere structured by their biological differences" (Collier and Yanagisako 1987:8). "Even if rooted in biology, gender (like reproduction, kinship, sexuality, and age) is always culturally elaborated. The

major task of gender theorists, then, is to discover the principles and processes through which 'nature' is transformed into 'culture' and to chart the ways these processes manifest themselves" (Mukhopadhyay and Higgs 1988:485).

The analysis of gender in feminist anthropology has found relevance in a number of areas under anthropological investigation with kinship being the most obvious (Tsing and Yanagisako 1983:511). In a reexamination of kinship theory, Collier, Rosaldo, and Yanagisako challenge the traditional anthropological view of the family as a 'natural' "institution designed to fulfill universal human needs" and assert that rather than being a cross-cultural universal it represents a modern ideal (1982:25). With kinship holding a central place in traditional anthropology, the feminist reanalysis of gender brings feminist scholarship to "heart of the discipline" (Tsing and Yanagisako 1983:511).

The area of symbolic analysis is also drawing on the work of gender theorists as the symbolic nature of gender and sexuality come under examination. Rather than assuming what "male", "female", "sex" and "reproduction" mean in various cultural contexts the concepts are being treated as symbols invested with "culturally variable 'meanings'" (Ortner and Whitehead 1981:1,ix). Inquiries are being made into "the sources, processes, and consequences of (the symbolic] construction and organization" of these concepts (Ortner and Whitehead 1981:1). Such work "seeks to go beyond a simple description of gender symbolism to an examination of how symbols are manipulated--ultimately to construct a theory of the relationship between behavior and symbols" (Mukhopadhyay and Higgs 1988:486).

Kinship and symbolism are but two of numerous areas that have drawn feminist-inspired studies of gender. Economic roles of women continue to be a focus with research extending into industrialized and developing societies as well as gatherer-hunter groups. Anthropologists are contributing to inter-disciplinary studies on women and development, largely through ethnohistoric research. All the various dimensions of women's lives have drawn the attention of anthropologists from sexuality, reproduction and mothering, to political activities, religious beliefs and practices, to women's art, music literature, and even games (Mukhopadhyay and Higgs 1988:462-5). Such studies are illuminating the complexity and richness of women's lives formerly stereotyped as mundane and confining. The recognition that women, cross-culturally, "play many roles,

simultaneously and over the course of a lifetime" (Mukhopadhyay and Higgens 1988:465) emphasizes the neglect throughout most of anthropology's history, yet at the same time serves as a stimulus for reevaluating some of the most widely and firmly held beliefs about the importance of (or lack of) women's contribution to the 'Science of Man'.

The characteristic dedication and innovative thinking of early women anthropologists drawn to the present and multiplied by the many women the field now boasts, have served the science well by doing what anthropologists do best: challenging ethnocentrism in society, in the discipline, and in themselves. As a science "built up in the face of prejudice" (Strathern 1981:667), anthropology may continue to simply find a place for women in the subdiscipline of "women's anthropology" or follow its "long tradition of breaking with the past" (Strathern 1987:287-7) and look to a realignment of its disciplinary approaches. Such a step can only further the goal of a holistic study of humanity.

#### Footnotes

(1) • Though Mead was an early exception the rule of ignoring the contribution of women of female subjects, it is interesting to note that "the current controversy surrounding Derek Freeman's (1983) attempt to discredit Mead's work on Samoa includes many references to the fact that Mead's primary informants were, after all, only young adolescent girls" (Scheper-Hughes 1983:111).

(2) • A regionally focused review of the literature by the "Gender and the Anthropology Curriculum Project," under a FIPSE grant to the American Anthropological Association, will provide curriculum guides for major culture areas, as well as archaeology, biocultural anthropology, language, applied anthropology, and several other topics. Contact Sandra Morgen, 208 Bartlett Hall, University of Massachusetts, Amherst. (Mukhopadhyay and Higgens 1988:462).

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## Demographic Affects of Breast Feeding

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Human demography is the study of patterns of death, survival, reproduction and growth of populations. Although the rubric of demography is vast, three major variables act upon any given population: birth, death, and migration (Bodmer and Cavalli-Sforza 1976:261-263). The interaction of these three variables will determine the viability of any living population.

Breast feeding of infants in human populations affects two of the three variables mentioned above: birth and death. However, this fairly straightforward issue has been complicated by the recent abandonment of prolonged breast feeding as the primary method of infant nourishment in both the industrialized world and in large portions of the Third World (Buchanan 1975:J49; Knodel 1977:1111). This complication has drawn the attention of many; including demographers, public policy makers, and even baby food manufacturers (Wade 1974). The purpose of this paper is to elucidate how the practice of human breast feeding affects the demographic variables of birth and death within the context of changing, infant feeding patterns.

Although the exact date of emergence of anatomically modern *Homo sapiens* can never be specifically determined, a range of about 70,000 B.P. to 30,000 B.P. appears to be in accord with available evidence (Fagan 1989; Smith and Spencer 1985; Wolpoff 1980). From this early, prehistoric point until the advent of the bottle, breast feeding was relied upon as a major form of infant feeding. Of course, isolated instances existed which deviated from this pattern, such as sugar water substitution for breast milk in heavily industrialized 19th century Central Europe (Knodel 1977:1111); but from the demographic point of view, these deviations are not significant in the overall scheme. With the advent of the bottle, the natural pattern of breast feeding was abrogated within a few generations. The demographic impact of this change is both significant and substantial.

It is estimated that 95% of all women are physically capable of successful breast feeding. In the first six months of an infant's life, breast milk provides 100% of all nutritional requirements. After six months and until

approximately one year of age, breast milk provides about 75% of an infant's nutritional requirements (Buchanan 1975). As can be seen, after six months an infant must be fed supplementally in order to remain healthy. "Until about 50 years ago virtually all infants were breast-fed" (Buchanan 1975:J54).

Human lactation affects the demographic variable of birth. In a summary of studies conducted in developing areas of the world, Van Ginneken (1974) shows that in non-contracepting populations the practice of breast feeding reduces fertility. In short, a population in which breast feeding occurs increases the length of postpartum amenorrhea experienced by this population's women. By increasing intervals between birth fertility or growth rate of the population may be increased or slowed down. This process involves a complex hormonal feedback system which is activated by the infant's stimulation of the mother's nipple; this stimulation results in lactational amenorrhea and suppressed ovulation (Buchanan 1975:J50-J54). In effect, breast feeding reduces the amount of births in a given population. To demonstrate the significant influence breast feeding has upon birth rates, a few examples may prove useful.

In a study of 5,000 Taiwanese women infant breast feeding was observed to extend for an average of 15 months along with an amenorrheic period of about 10 months (Jain, et al. 1970:259). As was expected, those mothers who breast fed for longer periods of time experienced longer periods of lactational amenorrhea than did- those mothers who breast fed their infants for a shorter period of time. The investigators concluded that practicing lactation may reduce by up to 20 percent the number of potential births that would occur if lactation was not practiced at all (Jain, et al. 1970:269).

Also, a study in the Javanese village of Mojolama (Singarimbun and Manning 1976) found a high correlation between breast feeding and postpartum amenorrhea. The average mother (whose infant survived until weaning) breast fed about 25 months and experienced an amenorrheic period of about 18 months (Singarimbun and Manning 1976:175-176). In this case, most lactating mothers began menstruation for almost a year after delivery, it does not extend postpartum amenorrhea indefinitely" (Buchanan 1975:J56) .

This Javanese village is not the only example of the extreme effects that breast feeding can have upon amenorrhea and birth intervals. The !Kung San of the Kalahari Desert usually breast feed their children for about 24 to 36 months and experience a period of

amenorrhea lasting around 25 months (Lee 1979:325-330). As can be evidenced in these cases and others (i.e., Huffman et al 1978; Cantrelle and Leridon 1971), breast feeding directly reduces the number of births in a population through the mechanism of postpartum, lactational amenorrhea.

Most recently, a study (Thapa et al 1988) based upon data from the World Fertility Survey estimates the reduction of potential fertility due to contraception and breast feeding in the geographical areas of Africa, Asia, and Latin America. The study found that breast feeding inhibits an average of four births per woman in both Africa and Asia, whereas breast feeding only inhibits an average of two births per woman in Latin America (Thapa et al 1988:680). Only in Latin America does artificial contraception prevent more potential births than does breast feeding. From these kinds of data, it can be seen that breast feeding plays a substantial role in retarding population growth and fertility. In a direct way, human lactation affects the demographic variable of birth.

In addition to affecting birth and fertility, human lactation affects the demographic variable of death in the form of infant mortality. Human infants who breast feed have a reduced risk of mortality. A review of available, historical evidence of European populations reveals "that the difference in mortality between breast-fed infants is enormous, even staggering" (Marcy 1981:319). More recently, in a survey and study of twelve Latin American countries, Palloni and Millman concluded that their "analysis consistently uncovered significant mortality reductions attributable to breast feeding" (Palloni and Millman 1986:230). The health benefits of breast feeding an infant may be summarized as follows: highly nutritious; protective, due to immunological qualities; and safe from contamination and/or spoilage (Buchanan 1975:J49). [See Appendix I for a more detailed description of the health benefits of breast feeding.]

Specific case studies also confirm the mortality reducing affects of breast feeding. In an analysis of 1,262 randomly selected Malaysian households (DaVanzo et al 1983), the investigators concluded that "longer durations of full breast feeding (without supplementation) substantially reduce the mortality of infants in our sample (DaVanzo et al 1983:395)." Infant mortality was directly reduced in this study by the important health benefits of breast feeding previously noted. In addition, breast feeding prolonged the mother's amenorrheic period, thereby increasing the interval between successive births. the Malaysian study found a strong correlation between longer birth intervals

and lower levels of infant mortality (DaVanzo et al 1983:391) .

In support of this point, data relating to 8,456 live births in rural portions of Senegal (Cantrelle and Leridon 1971) demonstrate the higher rate of mortality associated with shorter birth intervals. Although most mothers breast fed their infants for about 24 months, mothers who were forced to discontinue breast feeding due to pregnancy (shorter than usual birth interval) increased the probability of infant death in the first year after premature weaning anywhere from 50 to 150 percent (Cantrelle and Leridon 1971:532).

Breast feeding practices have affected infant mortality in the United States as well. In an analysis of R.M. Woodbury's study conducted in 1925, Knodel and Kintner (1977) re-present the data from approximately 23,000 live births in eight United States cities from 1911 to 1916 in graphic form (Knodel and Kintner 1977:399). From this graph it can be seen that infants breast fed for 12 months had a mortality rate around 35 per 1,000; and infants breast fed for only 2 months had a mortality rate of 120 per 1,000. Clearly, breast feeding has an effect upon the demographic variable of death as seen in the case of infant mortality.

From the demographic point of view, breast feeding populations tend to have a reduced fertility level and a reduced population growth rate. Breast feeding populations also tend to have a decreased rate of infant mortality compared to those populations that do not practice breast feeding. On the other hand, non-breast feeding populations tend to experience higher rates of fertility in conjunction with higher rates of infant mortality.

For some, the demographic point of view is impersonal and interested only in populations, not people. Others may contend that the above demographic data do not consider modern, western medical practices or properly prepared substitutes for human breast milk. These criticisms may be countered from a demographic standpoint.

First of all to know that in a survey and study of 29 developing countries, a mother who gives birth to a second child before the first child reaches his/her first birthday increases "the risk of dying [for the child] between the ages of one and five by at least 77%" (Thapa et al 1988:681-682), is demographic data easily translatable from the impersonal to the personal. Secondly, breast feeding practices and "the process of

lactation as it occurs among primitive and peasant populations [are] generally not comparable to [those] which occur in highly industrialized civilizations such as those found today in the United States and Europe" (Solien de Gonzalez 1964:875). This difference is attributable in part to variables such as water quality, sanitation, presence of hospitals (DaVanzo et al 1983:396,398), availability of refrigeration, sterilization of equipment (Buchanan 1975:J49), basic nutrition (Winikoff 1978:897), and artificial means of contraception as well as differing breast feeding techniques such as scheduled versus non-scheduled, "on demand" feedings (Solien de Gonzalez 1964:875).

In a sense, the demographic data concerning breast feeding do not consider modern, western medical practices because the majority of people in developing areas of the world do not have access to these kinds of resources. But also important is that "evidence does exist suggesting that there is still a significant health-promoting effect of breast-feeding, even where sanitation and education levels are high" (Winikoff 1978:897). To a degree modern, western medical practices and properly prepared substitutes for human milk do not and cannot replace human breast milk and its qualitative as well as quantitative affects upon individual mothers and infants, and populations in general.

As demonstrated in this paper, breast feeding directly affects the demographic variables of birth and death. In particular, a breast feeding population tends to experience a lower growth rate coupled with a lowered infant mortality. These demographic facts translate into a healthier population and a slower and more stable rate of population growth, characteristics usually sought by public health officials and public policy makers. Yet increasingly, populations are moving away from breast feeding practices and toward the practice of bottle feeding despite the human and economic costs involved. Kenya alone is estimated to lose \$11.5 million annually substituting cow milk and infant formula for human breast milk (Wade 1974:45). From a demographic point of view, the recent shift from breast feeding to bottle feeding does not seem to make sense. Although "breast feeding and birth spacing save lives" (Thapa et al 1988:682), the shift from breast to bottle "owes much to the commercial activities of the baby food industry" (Wade 1974:46). The presence of baby food companies and infant formula manufacturers in developing countries as well as in the more industrialized world appears to be a starting point for explaining the seemingly nonsensical change in infant feeding patterns (See Van Esterik 1989).

## Appendix I

"The importance of breast feeding for children's health has been emphasized by laboratory evidence on the biochemical, nutritional, immunological, and antiallergenic properties of breast milk, as well as by epidemiological studies showing improved nutrition, health, and survival among breast-fed babies. It has become apparent that mothers' milk is not only precisely tailored to the nutritional needs of human infants, but it is also a living fluid with active and passive factors to protect against infection. The truly remarkable nature of these properties is demonstrated by recent findings that secretory immunoglobulin A-producing cells in milk come originally from lymphocytes in the gastrointestinal tract of the mother. These cells respond precisely to the pathogens present in the immediate environment of the mother (and baby), travel to the breast, are excreted in the milk, are ingested by the baby, and protect the baby's gastrointestinal tract against the organisms most likely to threaten health at that particular instant. More elegant tailoring of host defenses to shifts in environmental threats could hardly be imagined. This precision certainly cannot be replicated by either prepared infant formulas or technical medical interventions such as immunizations or health care services."

[Winikoff 1978:897]

"Recent studies also suggest that, in the United States, breast feeding can nearly halve the risk of breast cancer relative to that of a parous woman who bottlefeeds her babies; the longer a woman breast-feeds, the greater the protection."

[Thapa et al 1988 :682]

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