Critical ecological medical anthropology

Selecting and applying theory to anemia during pregnancy on Pemba, Zanzibar

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De auteur presenteert een nieuw theoretisch kader dat twee ogenschijnlijk tegenstrijdige standpunten met elkaar verbindt: kritische (medische) antropologie en (medische) ecologische antropologie. De bijdrage van dit artikel ligt echter niet zozeer in genoemd theoretisch kader maar in de wijze waarop de auteur aspecten van beide theoretische oriëntaties kiest voor haar analyse. Zij laat zien hoe theorieën elkaar aanvullen. Zij begint met etnografische notities over anemie tijdens zwangerschap op Pemba, het op een na grootste eiland van Zanzibar. Vervolgens bespreekt zij de sterke en zwakke kanten van de twee genoemde theoretische perspectieven. Daarna legt zij uit hoe en waarom zij componenten van beide koos om tot een soort bricolage theorie te komen die zij aanduidt met 'kritische ecologische medische antropologie'. Tot besluit komt zij met suggesties hoe dit model toegepast kan worden in etnografische observaties.

[kritische medische antropologie, ecologische medische antropologie, theorie, anemie, Pemba, Zanzibar]

It does not take an anthropologist to observe that comprehending both the underlying and overarching meanings of that which we notice and are told is not easy. Yet, the analysis of the remarkable things we see and hear is often both the most nebulous and the most valuable part of anthropological research. Noticing particularities and juicy cultural tidbits is fascinating, but what can we learn about culture or human nature in the larger scale of things from the assorted details? Often, to make sense of those, we need theory, and strong, clear, usable, realistic theory at that. Medical anthropologists do not suffer from a dearth of theory; we can choose from structural-functionalist, transactionalist, ecological, cognitive-symbolic, political-economic, and critical approaches to analysis. Some of us work within one or more of these frameworks simultaneously, with varying degrees of awareness of which perspective(s) we have chosen, why we have chosen them, and what the implications of such decisions are.

In this article I present a theoretical framework that I fashioned out of several existing ones. This was done of necessity, in order to help me to organize and analyze lively ethnographic data about anemia during pregnancy collected between late May and

early July 2002 in Zanzibar, Tanzania (Young 2002a). Although the resulting framework is novel in the sense that its components and orientation are slightly different than those of other theoretical orientations, it is far from unique in its effort to combine several existing frameworks. Other examples of scholars integrating the two fields include Armelagos et al. (1992), Baer (1996), and Leatherman et al. (1993). Thus, it is the elucidation of the *process* of picking and choosing aspects from various theoretical frameworks that is the more interesting and more primary goal. In short, this article is an exercise in making explicit how theories can be combined and what the implications of those choices are for analysis.

In the first section, I present an abbreviated ethnographic description of anemia during pregnancy on Pemba, one of the islands of Zanzibar. The middle portion is more theoretical in nature. I first discuss two important commonalities of critical (medical) anthropology and ecological (medical) anthropology. Then, I highlight what I (with the invaluable insight of many scholars' critical analyses) have come to perceive as the virtues and weaknesses, and similarities and differences in both bodies of work. I then explain how I have selected morsels from each to create a cut-and-pasted theory that I have termed "critical ecological medical anthropology" (CEMA). In conclusion, I illustrate how ethnographic flesh can hang on this amalgamated theoretical skeleton by applying the critical ecological model to the ethnographic observations.

Ethnography

Anemia is one of the most pressing health problems for women of reproductive age on Pemba. Mild anemia was found to be as high as 72% in non-pregnant Pemban women; the prevalence of mild anemia in pregnant women is expected to be much higher (Stoltzfus 1997). On Pemba the prevalence of severe anemia[1] in pregnant women was established at 20.2% (Stoltzfus et al. 2001: 7). The consequences of anemia can be very serious. Severe anemia during pregnancy can impair immune function, cause reproductive failure (miscarriage, still birth, prematurity, low birth weight, and perinatal mortality), and maternal death during childbirth (Levin et al. 1993 in Galloway & McGuire 1994). Mild anemia can increase a person's susceptibility to other infections and cause a range of non-specific complaints such as fatigue, headache, faintness, anorexia, and bowel disturbances (Eddleston & Peirini 1999: 510).

In an effort to reduce anemia in Zanzibar, the United Nations made ferrous folate supplements available to pregnant women in early 2002. My research in Pemba began as an investigation of how these iron supplements were perceived and used by mothers and mothers-to-be, and broadened to encompass all of the treatments for anemia available on Pemba and the understandings of the illness itself. In the middle of the study, I felt compelled to expand the study further, beyond the variety of treatments, as I realized that neither the illness nor the treatments could be understood outside of their topographical, historical, political, social, ideational and economic contexts. Thus, the study concluded with an etic as well as an emic description of anemia during preg-

nancy. Due to space limitations, I have heavily abridged much of the ethnographic description. I have limited my discussion to portions of the aforementioned contexts; I have included just enough to illustrate how the model helped me to analyze the information that I gathered. (For more discussion of perceptions of pregnancy and perceptions of anemia during pregnancy, see Young 2002a.)

"Zanzibar" is the name of an entire archipelago anchored down in the glimmering turquoise East African part of the Indian Ocean with about 880,000 residents (Zanzibar & UNICEF 2001). Unguja is the biggest island, 1464 km², and the one most often (mistakenly) called Zanzibar, on which about 550,000 residents live. Pemba is the second biggest island, with 864 km² and about 330,000 inhabitants. The two islands are about 50 km apart, separated by the 700-meter deep Pemba channel. In addition to these two islands, there are a slew of other islands and islets, some inhabited, most not, which also comprise Zanzibar. The entire archipelago is situated about 50 kilometers off the coast of mainland Tanzania, five degrees south of the equator (Garssen 1993a).

Because of its strategic location off the coast of East Africa, Zanzibar has had contact with traders from as far away as India, China, and Greece for hundreds, even thousands of years. After periods of Persian and Portuguese influences in the 1500's and 1600's, it became part of the Sultanate of Oman and Muscat in 1784. After a dream about his own assassination Sultan Seyyid Said decided to move the headquarters of the sultanate from Oman to Zanzibar. During his rule, he introduced clove production to the island, and facilitated their large-scale cultivation in plantations. In doing so, he made two important contributions to the conditions in present-day Zanzibar. Zanzibar became very wealthy from cloves until Indonesia began producing cloves, more bountifully and cheaply than Zanzibar did. Because of its dependence on cloves, Zanzibar now suffers much financial hardship due to dwindling revenues. Secondly, Seyyid Said laid the roots for the later racial miscegenation between Arabs and Africans by insuring the plantations were owned by Arabs and worked by Africans.

The Sultanate did little in the way of health care for its people. While Livingstone was in Zanzibar in 1865 preparing for his final expedition, he proposed the name "Stinkibar" as a more apt name than Zanzibar (Livingstone in Garssen 1993a: 9). Inspired by Livingstone's writings of the appalling health and social conditions on Zanzibar, late 19th century missionaries tried to exploit the powers of hospital medicine in order to gain influence over the indigenous populations. "Curative care in the first hospital on Zanzibar, *Nôtre dame des Anges*, was a distant second concern to the mission's true objective: to baptize children and old people prior to their deaths" (Garssen 1993a). Few natives attended; the Mission attributed this to awe, "The Blacks are somewhat afraid of the Whites, whose superiority often inspires them with as much fear as admiration" (De Courmont in Garssen 1993a: 13).

By the late 1800's several European countries had competing interests in the region. In their rush to keep the Germans out of East Africa, the British forced the Sultan to formally separate from Oman and declare Zanzibar a protectorate of Great Britain in 1862. Though the Sultan remained a figurehead, the British took over financial control of the government, including the Sultan's accounts, and appointed British ministers to all key positions. Arabs remained part of the elite class, with Indians below them, and

Africans, who comprised two-thirds of the population (half of whom were of slave origins) were the lowest ranking citizens (Nisula 1999: 34).

The British played a more active role in public health than the Sultanate had, but it was not a necessarily welcome one. The British colonial government opened a hospital for colonized subjects in Zanzibar Town, known as "The Native and Subordinate Hospital of Government." "Native" referred to Africans and "Subordinate" to Asians: Arabs, Indians, and Comorans. Health services were arranged according to the alleged needs of diverse races and offered care according to the medical standards thought appropriate for each group, thus racial differences were naturalized through curative medicine (Nisula 1999: 235). It is noteworthy that one (if not *the* prime) motivation for the improvement of living conditions and disease prevention was concern about the decline of the native population who were the workforce of the island.

Preventative public health measures, coordinated by the newly established Health Department, began only when the island was faced with a major plague epidemic, which lasted from 1899 until 1905. Health officials often resembled the paternalistic, autocratic and outdated "Medical Police" who had once been important authorities in Western Europe. "Mosquito Brigades" were one such example of these medical police. They made weekly visits to inspect potential mosquito breeding sites. When larvae were found, notices were served to householders and legal action was taken against repeat offenders. The Protectorate also worked to expand and improve vaccinations, general sanitation, health education in schools, collection of vital statistics, and dispensary facilities. Mother and Child Health services on the island were first offered around this time. However, the care that was offered was of such low quality that many of the posts were closed soon after opening.

The depression of the 1930's caused the government to curb public health expenditure, but the Rockefeller Foundation stepped in to fund the construction of thousands of latrines and boreholes. The population remained suspicious of receiving something for nothing, and rumors that the government would levy some sort of hut tax as soon as a building was erected caused most of the new latrines to remain unused. Village Health Boards were started in the hope that villagers would accept from their own leaders what they refused to accept from the government, but to no avail.

In 1957, the British allowed the first political elections in Zanzibar. During these elections considerable social tensions, especially racial tensions, surfaced. Three political parties emerged: the primarily African Afro-Shirazi Party (ASP); the Zanzibar and Pemba People's Party (ZPPP) another, more conservative, predominantly African party; and the Arab-dominated Zanzibar Nationalist Party (ZNP) who wanted Zanzibar to preserve its independence from the mainland. The Arab-dominated ZNP, the largest single political party, and heavily favored by the British, came to power when Zanzibar became independent from Britain in 1963. Political dissatisfaction among the other two parties led to the overthrow of the freshly independent, mostly Arab, government, just 33 days after independence, on April 12, 1964. At least 5,000 Arabs were killed during this uprising, and large numbers of Indians and all Europeans, were expelled from the islands.

Three months after the Revolution, the governments of mainland Tanzania, (Tanganika) and Zanzibar merged to form the United Republic of Tanzania. No popu-

lar referendum was held. This union was motivated in great part by the protection the mainland could offer in case of a second uprising. Zanzibar, with its revenues from cloves and shipping, represented an economic boon for the mainland. The union was resented by many Zanzibaris from the outset.

Abeid Karume, a semi-literate revolutionary ASP party member became the post independence leader of Zanzibar. He declared the ASP to be the only lawful political party, and forbade elections for the next sixty years. Africans were appointed to positions of responsibility that had previously been held by Indians, Arabs, and Europeans who had been forced to leave the country. For Karume, revolutionary zeal was a more important qualifier for these jobs than formal training was; he distrusted intellectuals and took pride in the fact that none of his ministers had been educated beyond the elementary level. With such an attitude, educational institutions were not given priority and suffered greatly. Even the legal system was abolished in 1970, replaced by a system of People's Courts, staffed by loyal ASP party members. In the eight years of Karume's increasingly despotic rule, approximately 35,000 educated and skilled people fled the country, and Zanzibar became virtually closed to Western visitors.

Under the ASP, all land was nationalized; land from 743 plantations (557 in Pemba and 181 in Unguja) was redistributed in three-acre sized plots. While it was intended to improve the plight of the poor landless, many argue that the fragmentation of land holding ultimately led to lower productivity. When land redistribution stopped in 1974 a significant proportion of the land on Pemba had not been redistributed, and there were still people in rural areas who had not received any. About 5.4% of rural households remain landless today (Zanzibar & UNICEF 2001).

Pemba has suffered under the ASP/CCM government.[2] Arnold and McKim write, "Pemba has been the object of state repression and systematic underdevelopment ever since the CCM government took power" (2001). Because Pembans did not much participate in, nor generally support, the Revolution, they have since been regarded by the Zanzibari and Tanzanian governments as dangerous, disloyal citizens, and have been treated as such. "Since the 1960's, military forces in Pemba have engaged in public beatings, humiliation, torture, rapes and the looting of property with full state support, as part of a campaign aimed at cowing the population and suppressing any potential opposition" (Arnold & McKim 2001). Recent elections have further crystallized this marginalization.

Zanzibar returned to a multi-party democracy in 1992, but the last two elections are alleged to have been scandalously undemocratic. The Zanzibar elections on October 22, 1995, the islands' first multi-party elections since the 1964 Revolution, are widely believed to have been manipulated by the ruling party. Because of the circumstances of the election, the international donor community canceled most aid to Zanzibar.

Since the 1995 election, friction between CCM and CUF has been rife.[3] Discriminatory practices carried out in the wake of the elections removed most Pembans from Unguja and further exacerbated Pemba's marginalization. Residents of Pemba, from where CUF primarily draws its support, were particularly targeted. Hundreds of Pembans were fired from the civil service and others lost their homes as the Revolutionary government razed several of Unguja's Pemban-populated neighborhoods with

neither notice nor compensation. A dozen CUF leaders were imprisoned on spurious accusations of treason.

The second multiparty election was held on October 29th, 2000. This election was alleged to be filled with more manipulation, e.g. army and police were deployed across both islands to seize all ballot boxes, counted and uncounted, and beat opposition party agents who had been present in the polling stations to monitor the votes. In protest, a broad-based movement in Tanzania prepared to hold a nation-wide, peaceful demonstration on January 27th, 2001, to call for a re-run of the Zanzibar elections and constitutional reform of the Union between Tanganyika and Zanzibar. Police and military, acting under orders from the Tanzanian government, reacted with an extraordinary show of force. In mainland towns, demonstrators were harassed and beaten, and many were arrested. Yet the reactions of security forces to the mainland demonstrations were mild in comparison to the state-sanctioned campaign of reprisals that has been carried out in Zanzibar, and especially in Pemba.

Hundreds of police from the mainland were deployed in the islands, where they committed acts of intimidation prior to the start of the demonstrations. Demonstrations in the three main towns of Pemba were met by violence on the part of the security forces, which, far from ensuring the security of citizens (the stated purpose of their presence), placed it in jeopardy. Police detachments fired tear gas pellets and live ammunition into the crowd both from the street and from the top of nearby apartment buildings. A police helicopter, reportedly carrying the Tanzanian Chief of Police swooped in over the crowd, dropping tear gas canisters and, some say, bullets. As protesters fled, police gave chase, arrested at least fifty people, and began to undertake violent house-to-house searches. The police and army prevented ambulances and private cars from carrying the injured to the hospital by beating the drivers. At least one doctor was arrested for simply attending to a patient. Relatives coming to the hospital to claim bodies or to inquire about the wounded were subjected to harassment and beatings, and in one instance, death. When patients were discharged from the hospital they were not sent home but taken immediately into police custody, and charged with participation in an illegal gathering – though many of the dead and wounded were not involved in the demonstration at all.

January 27th looms large in the consciousness of Pembans. Few discussed it with me outright, though there were daily allusions to the violence committed against Pembans by the government. One close friend spoke openly with me about it. His mother was shot in the leg, and her neighbor, with whom she had been talking, was shot fatally. Police had thought the man shot fatally was her husband, a prominent CUF member.

Zanzibar is no longer the rich, prosperous island it once was. Because of ASP (now CCM) policies like the government's right to confiscate any property at any time, the ban on mortgage charges, and its virtual closure to the West, little external investment was made in Zanzibar until recently. Additionally, because of international support for Nyerere's Socialist experiments, little reform in spending was encouraged. A severe drop in the price of cloves has also contributed to economic hardship. In 1982 one ton of cloves was worth 9000 USD, in 1998 one ton of cloves fetched only 1000 USD.

Zanzibar's present economic mess can also be attributed to gross mismanagement of funds, failed attempts at industrialization, inflation, and too much borrowing. Of late, it has become heavily dependent on foreign aid (Zanzibar & UNICEF 2001). As a result, Zanzibar has a very unstable economy.

In an effort to reign in the budget that was spiraling out of control, a policy of economic liberalization was initiated in the 1980's. This was disastrous for the living standards of 33,000 government employees (who then comprised 95% of all employed persons on the islands). Consequently, absenteeism, lack of motivation, and the augmentation of income through dubious means have all become wide spread practices. Wages are not the only things that have suffered; the entire infrastructure of Tanzania has been compromised as well.

The faltering economy has impacted all of the government-provided services; the quality of utilities like electricity and water, roads, and health care are all deteriorating, and seemingly more quickly on Pemba then in Zanzibar (Zanzibar & UNICEF 2001). The supply of water is a good case in point. Public access to clean water has deteriorated during the past decades, and like the drought in Nancy Scheper-Hughes' Bom Jesus, its origins lie in history and political economy and not cruel geography (1992: 69). Ironically, the ground water supply is plentiful, but leaking pipes cause so much water to be lost in the process of pumping it that it cannot satisfy the demands. The water system dates back to the Protectorate; it has not been significantly improved since before the Revolution. In 1978, 41% of Pemba used piped water, while today only about 16% of Pemba gets piped water (Zanzibar & UNICEF 2001). The supply of water on Unguja is better than on Pemba; on Unguja, 45% of homes have piped water. The situation is actually worse than these statistics convey, for they do not reflect the fact that piped water is often only available at irregular intervals. Though as promised by the revolutionary government, the water is free.

The roads are another good example of public services that are deteriorating asymmetrically on the islands. Pemba has only one major road, which runs from the north to the south of the island, and connects the three major population centers. The condition of long sections of the road is atrocious. I estimate the beating that a body takes in the course of the three hour ride from the north to the south of the island is equal to about one moderate car crash. The appalling state is in part attributable to the doubling of the number of cars in Zanzibar in the last five years (Zanzibar & UNICEF 2001). Heavy rainfall also erodes and damages the road, a problem particularly noticeable on Pemba (Zanzibar & UNICEF 2001). However, the primary reason for the bad conditions is that the government has done little to rebuild or repair any of the roads in Pemba. I was told that in the last five years, five new roads have been built in Unguja, and in that time, none have been built or significantly repaired in Pemba. The consequences of such poor roads are numerous: wear on vehicles, increased cost of transport of goods, impossibility of transporting very sick people to a more adequate health center.

The condition of the water supply and roads is bad, but health care is probably the gravest part of the crumbling infrastructure. Equity in health care has been espoused as an explicit principle of Zanzibar's health policy since the overthrow of the Sultanate in 1964. Equitable healthcare for all stood in welcome contrast to the miscegenation so

prominent in the British health care system. Socialist principles motivated the government to find methods to improve access to health services and concerned both affordability and availability, (though improving acceptability was never given much attention) (Garssen 1993b: 50). Yet the quality of services suffered greatly under the Socialist government because of their neglect of education in favor of revolutionary zeal, and the murder or exodus of skilled personnel.

Accessibility was improved by the construction of health facilities called primary health care units (PHCU's). Clinics are more numerous than they ever were; today there are three types of health care facilities: hospitals (3 in Unguja, 3 in Pemba), cottage hospitals (2 in Pemba), and primary health care units (59 in Unguja, 44 in Pemba) (Zanzibar 2002). Now, approximately 89% of Zanzibar's population lives within 5 kilometers of a health facility, and nowhere does the distance of a primary health care unit exceed 10 kilometers (Garssen 1993b). Affordability was improved by declaring all treatment free.[4] Charges for health services were abolished after the revolution, and visits to the hospitals and clinics remain free to this day. Yet a free consultation is not to be confused with totally cost-free health care; though some medicines are sometimes available free of charge, patients must usually purchase all of the necessary medical equipment and medicines required for their treatment. For example, it is free for women to deliver in the hospital, but they must spend at least 10,000 TSH (about 11 USD) to buy gloves, plastic sheets, needles, syringes and intravenous infusions needed (Lees-Mlanga 1998: 59). Serious health problems cannot be treated at clinics, thus one must also pay for transportation over very bad roads in order to get to the hospital.

Quantity cannot compensate for quality. While it is indisputable that Pembans have access to health care, the care that is available is often not worth the visit. The PHCU's are often under-equipped, undersupplied, and understaffed (Zanzibar 2002). The workers at the PHCU's are usually health aides, which means they have had only two years of training, which is insufficient to evaluate the broad substantial range of patients. At one of the cottage hospitals I visited, the "doctor" who was responsible for running the entire hospital had had only four years of training. In addition to, or perhaps because of, their insufficient training and low pay, many health care workers are unmotivated and spend their shifts chatting and snoozing instead of working.

The political properties of medicines and health care must also be understood; medicines have become a metonym for the government, and a rather oppressive, manipulative one at that. On Pemba, medicines have become perceived as symbols of the government's (dis)regard, and used as political weapons, both offensively and defensively. Shortages are a generative theme in Pemban life. One of the first "Pemban" words I learned was *kivunge*, and I was always congratulated on my proficient Swahili when I used it. Literally, *kivunge* means small bunches, (*ki-* is a diminutive and *vunge* means bunch) and is used, for example, when someone buys small amounts of sugar or tea at the market. The second use of *kivunge* refers to shortages in supplies; electricity and water are most commonly referred to with this word, but petrol and medicines are as well. Greetings usually include inquiries or predictions about *kivunge*, such as when the water will come back on, or if the electricity will be working that night. Shortages are numerous in type and frequency, and they are surprising in their far-reaching ef-

fects. They affect evening get-togethers; social calls are generally only made on nights when there is electricity. Sometimes there is not enough petrol, so *dala dalas*, local buses, can't travel as expected. Sometimes there is no water to bathe the children.

Shortages (whether real or perceived) of medical supplies (both medicines and staff) have come to symbolize the government's manipulation and neglect of Pemba. During lunch of green bananas boiled in coconut milk, a friend said to me, "Sera, do you want to know why Pembans don't like the government? Because of what the workers at the hospital were saying yesterday. They don't give us medicines or other medical equipment." She went on, "Medicines are only supplied during the honeymoon period of the presidency, when the government needs some credit from the people, or when DANIDA or UNICEF remember us." She went on to discuss the state of the roads, the electricity, and the water.

I was given many other examples of party politics spilling over into the world of health care. After the violence and murders on January 27th 2001, two 40-foot containers of aid were packed up and ready to be delivered to Pemba, pending the signature of the Director of Red Cross Tanzania. As he was also a CCM member running for Minister of Parliament, he refused, and the supplies languished. This is widely cited as proof that CCM punishes CUF (and by extension, the whole of Pemba) by blocking the passage of medicines to Pemba. In return, CUF has asked donor organizations to stop all non-humanitarian aid to Tanzania. Another friend explained to me that giving money to CCM is the same thing as squeezing CUF. "We are just a political party, CCM is the government. So CUF doesn't get aid from outside, only CCM does." For CCM members, CUF attempts to stop aid to Tanzania are proof that CUF "wants people here to die."

During a visit with a high-ranking health official on Zanzibar, the conversation turned to the political climate of medicine use. The following quotations are a synopsis of the discussion about why people are not using the drugs that are provided for them; he feels "his people" need help, but accuses them of not accepting any.

> After the political changes, [an allusion to the elections] people were nervous about using certain drugs. There have been some misbeliefs in medicine provided by the hospital. There are particular Pemban particularities, misleading campaigns carried out by malicious political leader to disrupt the policies of the Ministry of Health. It isn't politics in the right sense of the word. The opposition is strong here. It's supposed to be constructive, but it isn't. Some completely refuse to accept them. The failure of compliance with taking the drugs that are distributed to combat X,Y, and Z is their [the opposition party's] fault. These [messages] are engineered by ill-willed population, while the government is trying to marshal support. The political climate was heavily polluted.

He then turned the issue into a racial one:

> The poor Arabs here on the island still believe an Arab sultan will one day come back and rule the islands. Relations with Arab communities in Oman and Saudia have influenced them to sow seeds of hostility here in our community. A number of people are not clever enough to see it. They [CUF] were saying that the cholera and polio vaccines were not pure, not holy, that Muslims are not supposed to take them.

He concluded by shaking his head sadly and yet knowingly, standing up and saying, "We need continuing education to raise awareness of our people." The meeting was over.

Near the end of my stay, a neighbor shared with me his skepticism about the drugs that were being distributed for free. He saw merit in CUF's message, "If they really are medicines that are good for us, they must be expensive. Why is something of value suddenly being given away for free?" What the health official saw as a lack of gratitude and unwillingness to be helped, ("They simply think that anything that is free is worthless") Omar saw as a healthy dose of skepticism in the light of an abundance of animosity.

The Tanzanian government is not the only provider of medicines that Pembans are skeptical of. Some villagers felt that filariasis tablets distributed last year had many side effects, including reducing the sexual ability of men (Khalfan 2002). They believe that the supplements were intended to reduce their fertility rate because donor countries "are always complaining about overpopulation." They reasoned that the countries' solution to this burden was the reduction of their fertility.

In addition to a shortage of medicines (due to either skepticism or misappropriation), there is not enough competent staff. To Pembans, staffing shortages seem to have been exacerbated by CCM. During the last campaign, CCM promised jobs to its party members. To fulfill the promise, room had to be made; many CUF affiliated hospital workers were fired, and replaced by CCM members. One of my informant's sisters was a midwife at a PHCU, but was fired last year "for political reasons." A very talented woman who had been a nurse coordinator, a midwife trainer, and worked closely with the German NGO had been demoted to a dispenser of medicines at one of the PHCU's near my house. "Political issues caused me to drop," she said.

The Tanzanian government remains in complete control of what the storage centers on each island receive. Even as the government provides fewer medicines in the hospital, they have been sure to maintain a measure of control over the increasing amount of medicines circulating in the private sector.[5] Typically, the Tanzanian government sends all of the medicines for Zanzibar to the main island. This is not always done in a timely or regular manner, and there are never enough.[6] Once medicines do arrive on Unguja, they are shipped over to the storage center in Wete, and from there, distributed to the hospitals and the District Health Management Team who see that each of the PHCUs receive their fair share. To further complicate things, there are also smaller storage areas at the hospital in Chake Chake and Mkoani. The health care workers seem very concerned about the equal distribution of medicines to the different institutions once the medicines actually arrive on Pemba. This concern for equality was the reason given for why the remaining 26 tins of ferrous had not been distributed: there was not enough for each PHCU to have one. The allegations that I had heard that the government held up medical supplies between the mainland and Unguja, and Unguja and Pemba were made more real by the UNFP cardboard boxes in the medical storage room stacked as tall as I am, brimming with tins of ferrous tablets. I estimated that there were at least 1200 tins, each containing 1000 tablets. Only they were of no use; they had all expired because they arrived on Pemba too late.

The health care situation continues to worsen. Spending in the health sector has declined from 10% of the total recurrent budget in 1995/6 fiscal year to 5% in 1999/2000 (Zanzibar & UNICEF 2001: 53 of 62). Because of the economic failure, the government can no longer sustain the formidable institutional structures it had created. Compounding the economic strain is the growing population it must serve. The total fertility rate for the whole of the archipelago is 8.2, though for rural areas, it is thought to be higher (Garssen 1993b: 13). People younger than 15 years constitute half of the population. Intercensal growth in the last few decades has shown population to be increasing by more than 30% (Zanzibar & UNICEF 2001). The limited health care available is reflected in the life expectancy at birth; in 1988 it was only 48 years.

Public health control measures have suffered not only because of governmental economic strife, but also because of shortsighted management of these programs by NGO's sometimes compounded by sudden withdrawal, as was the case in the mid-1990's. Malaria control is one such example. In 1967, six years into a WHO campaign, the rate of malaria had dropped from a prevalence of 75% to only 7.8% in Unguja and 1.7% in Pemba (Schwartz et al. 1997: 37). Malaria was no longer considered a health problem, and so the program was discontinued. The prevalence then skyrocketed, and USAID interventions in the 1980's were to no avail. At every clinic I visited during my research period, I was told that malaria was the biggest infectious problem which confirms the findings by any number of health researchers (cf. Matteelli et al. 1994; Nisula 1999: 208; Schwartz et al. 1997; Stoltzfus et al. 2001).

There is much to say about how Pembans think, and are thought of throughout East Africa. Here, I will include just two features of the ideational environment. The first is that of spirits.[7] For centuries, Pemba has had a reputation as a center of powerful traditional medicine, magic, and spirits. At the beginning of this century, Evelyn Waugh wrote that novices would come from as far as the Great Lakes and even Haiti to study "the witchcraft and voodoo" of Pemba (Waugh 2002). Even today, Pemba is known throughout East Africa as the heart of powerful cults of spirit worship. Many Ungujans think that *everyone* from Pemba is some sort of sorcerer. I have even heard it said that Ungujans and mainlanders avoid visiting there, for fear of becoming possessed. Spirits are not unique to Pemba, (informants told O'Malley during her research that anywhere from 50-90% of women in Unguja have been possessed (2000: 192)), only they are thought to be more powerful there. Not only are they important as supernatural ideational landscape, they are important to that of health, "While the *shetani* can be read as many things by a visiting anthropologist, for their hosts, *shetani* are primarily understood as health problems" (Nisula in O'Malley 2000: 192). Because of the number of spirits on Pemba, one might surmise that there is a commensurate number of health problems.

The second is the connotations of physical appearance. The miscegenation that was so rampant during both colonial periods has been discussed, as has the ethnic composition of the political parties, but the effects thereof have not. The skin color and other physical features of Zanzibaris fall along a continuum, from very dark skinned, so-called "African" features, to very light skinned, "Arab" features. "Arab-looking" people are assumed to be CUF members, and are usually harassed by CCM officials,

the more "African" party. More "Arab-looking" people live on Pemba than anywhere else in Tanzania. The family with whom I lived on Unguja several years ago were more "Arab" looking than "African.' I was with them on several occasions when they were extra carefully scrutinized, simply because of their physical features.

Zanzibar is often thought, and even markets itself to tourists as a lush spice island. Rich stereotypes notwithstanding, Pembans do not even produce enough food for their own needs. In spite of a warm and humid climate and reasonably fertile soil, the production of essential food has fallen far behind local demand (Zanzibar & UNICEF 2001). Even though over 90% of arable land is cultivated, much of the staple food, e.g. rice wheat, flour and sugar, must be imported from the mainland. This is because much of the cultivation done is for cash crops, namely cloves. Secondly, as discussed above, not all of the land repossessed during the revolution has been redistributed, and is therefore left fallow. This brings an increase in the cost of food and a measure of dependency on the mainland.

Diet is limited not only by the production and cost of purchasing food; it is also dictated by social norms. Ideally severe nutrient deficiencies would be prevented through a diet adequate in quantity, quality, and diversity. Dietary change is, however, often constrained by limited access to food, either because of cultural beliefs about the appropriateness of certain foods (which become particularly predominant during pregnancy) (Jackson & Jackson 1987: 588) or because of economic limitations. For example, Pemban women's postpartum abstinence from nutritious "blood-giving" foods limits their ability to recuperate from the blood loss at birth. In addition, women may not be independent enough within their own household to implement the nutritional changes that would benefit their health.

Zanzibar's traditional patriarchal society dictates the subordinate position of women which, historically, has been one of marginalization (Zanzibar & UNICEF 2001). Women rarely leave the house, and almost never without permission. Rarely are women employed outside of the home; when they are it is as nurses, teachers, and performing menial tasks within the tourist industry. When they do go out, they dress very modestly, with long dresses and head coverings. "The woman's ideal behavior is kind, agreeable, quiet and helpful to her family and friends. She is supposed to demonstrate self-respect through her modest dress, in her quiet calm comportment, and in her respectful interactions with others" (O'Malley 2000: 202). Marriages are still polygynous, and residence is patrilocal. Men – fathers, older brothers, and husbands, have the last word in all matters. "Men are perceived to be more rational than women, who are said to be saturated with emotional dispositions, and the contrasting codes of conduct – self-control and respectability are often referred to as principles of male demeanor, unlike chastity, shyness, and virginity which are commonly attributed to women" (Nisula 1999: 31). Obedience is one of the most important qualities for a female. Because women remain within the privacy of their own home or that of their neighbors, men usually perform tasks in the public arena. This includes going to the market to buy food. Because women do not do the marketing, they rarely choose the food that is purchased. If they farm, they do have a say over which food is grown. Rural women are responsible for planting, weeding, and harvesting, and all the household

activities, as well as the care of the children (Zanzibar & UNICEF 2001). These activities cost a lot of energy, energy that needs to be sustained by nourishing food, which is not available frequently enough, nor in sufficient quantities. In return for the women's subservience, the men are supposed to bear responsibility for household maintenance and leadership (Zanzibar & UNICEF 1995).

These nutritional limitations put pregnant women (along with small children) at the highest risk for iron-deficiency anemia in sub-Saharan Africa. Both groups are prone because while they intake very little iron, they also have a very high physiological demand for it. Typically, women's and children's meals are the lowest in animal products and high in foods that inhibit iron absorption.[8] Women need it for tissue synthesis in their own bodies, of the placenta, and of the fetus. Women also lose large amounts of iron completing a normal pregnancy due to blood loss during delivery.

In Zanzibar (and throughout sub-Saharan Africa) nutritional causes of severe anemia are compounded by infectious causes such as HIV, malaria, and geohelminths, or worms. On Pemba, two parasitic infections are most important: hookworms and malaria (Stoltzfus et al. 2001: 7). Hookworms are endemic along the entire east coast of Africa (Stoltzfus et al. 1997). Adult hookworms live in the intestine of infected individuals and cause chronic intestinal bleeding by feeding on the intestinal mucosa; they are the most common infectious cause of anemia worldwide (Eddleston & Peirini 1999). In Pemba, transmission of hookworms and other geohelminths is intense (Stoltzfus et al. 2001: 5). As such, presumptive treatment of hookworms is recommended according to the World Health Organization's Standard of Care in order to prevent anemia during pregnancy (Stoltzfus & Dreyfuss 1998). The crumbling infrastructure means that more and more water is drawn from unclean sources, sources that are often infected with these very parasites.

The incidence of malaria on Pemba is also very high. *Plasmodium falciparum* is the species of malaria endemic to east Africa and the species most pathogenic in terms of anemia (Verhoef 2001). Malaria causes anemia through a variety of mechanisms that include decreased iron absorption, suppression of erythropoiesis (productions of red blood cells) and hemolysis of infected red cells (Brabin 1992). Women in their first pregnancy experience compromised immunity to malaria and are therefore particularly vulnerable to malaria-related anemia (Desowitz 1991). Chronic malaria often worsens during pregnancy, even for multigravidae, and this is often complicated by folate deficiency (Reuben 1993).

Even in this brief ethnographic passage, it becomes clear that there are a number of factors working concomitantly to exacerbate anemia during pregnancy. In the next section, I discuss the theoretical decisions that I made to help manage this rich information.

Hope in the commonalities

My experiences working as a biological anthropology research assistant with the Dogon people in Mali have made it impossible for me to ignore the importance of our

biological selves in the worlds in which we act and interact. But being part of a research team that was testing evolutionary theories without any ameliorative action planned, (and even expressly forbidden), in a place where 47% of children died by the age of 5 years, made me insistent that the consideration of politics and potential for action be a part of my own anthropological approach. For the former reason, I was drawn to ecological (medical) anthropology, the theoretical perspective that best remembers the biological human body. For the latter reason, I was drawn to critical (medical) anthropology. Yet at the outset, both academic literature and personal experiences made it seemingly impossible to utilize both bodies of theory. In a series of scathing critiques (e.g. Fabian 1982; Singer 1989b), proponents of each accuse each other of ignoring the power of culture to shape the body and its functions, or denying the relevance and variety of bodily phenomena to culture (Sperling & Beyene 1997: 137). Writing my Bachelor's thesis under the tutelage of a biomedically-oriented anthropologist as well as a culturally-oriented one reinforced the impressions that I had drawn from the literature that the two were incompatible.

Yet I have become convinced of late that the two perspectives need not be irreconcilable, for they have two important points in common. Though they consider the origins of disease as different, both are similar in that disease is embedded in networks of multiple causation (Wiley 1992: 223). Secondly, both perspectives consider how individuals respond to threats to their well-being within the particular parameters of said environment; it is "only" the networks of causation each considers that are different. These commonalities convinced me that both perspectives could be utilized to examine how pregnant women on Pemba maintain their health within the many realms of their environment. But how broadly should the term environment be interpreted? Which actions should be regarded as health-motivated responses to the environment? How can one reconcile the two frameworks without lapsing into reductionism (for which traditional ecological anthropology has fallen out of vogue) or forgetting the biological body (as critical anthropologists have been wont to do)?

Discordant bodies

I was originally drawn to medical ecology because, through its consideration of the biotic, abiotic and social environments, it was the most comprehensive approach to culture. Such consideration "attempts to account for as many environmental variables as possible" (McElroy & Townsend 1998: 105). This is the strength of the ecological approach. It makes it possible to relate biological as well as cultural factors, and do so on the same level of analysis (Kandel et al. 1980). Biology and culture have been disparate for too long; ecology can offer a framework in which both biological and cultural anthropologists can work within (Alland 1972; Cronk 1991: 25; Wellin 1998: 21). Alland, one of the founding fathers of medical ecology felt that the adoption of such a perspective would enable medical anthropology to bridge the yawning chasm that divides the biological and sociocultural arms of the parent discipline (Alland 1966). An example of the commitment to the integration of the physical and the ideational is

found in the opening lines of *Nutritional Anthropology*, "Differential nutritional status, by making some people more fit than others, has wide-sweeping social, political, and economic implications" (Jerome et al. 1980: 1). Thus, ecological medical anthropology can offer a holistic framework, if, when considering the environment, it does more than just pay "lip service" to the importance of the political and economic effects upon it.

Yet some of the most important figures in ecological anthropology have been materialists like Marvin Harris, Andrew Vayda, and Roy Rappaport, who believed that cultural systems are adaptive responses to ecological variables. As those ecological variables are generally those of the physical ecosystem and not of the social world, this has often meant that non-physical environmental factors have been neglected (e.g. McElroy & Townsend 1998). As such, traditional ecological medical anthropology is accused of having failed "to consider fully or accurately the role of social relations in origins on health and disease" (Singer 1989b: 223).

In more recent work, the integration of social and cultural factors in ecological medical anthropology has often continued to be viewed as unsatisfactory (Wiley 1992; Van der Geest: pers. comm). "Typically, writings that adopt this [ecological] perspective abstain from analysis of critical relational factors, such as ownership of the means of production, export of capital, extraction of profit, and racial and sexist oppression that underlie and ultimately determine human response to the physical environment" (Singer 1989a: 1194). Baer takes medical ecologists to task for not assessing the relative contribution of the diverse factors that they do consider (1996: 130). Due to the exclusion of social aspects of the environment, particularly the political and economic ones, ecologists have even been accused of "stopping short of real analysis" (Wiley 1992: 218). The self-titled political ecologist, Meredeth Turshen, is another critic of traditional ecological analysis. She writes, "Although environmentalism [ecology] opens our eyes to factors such as diet, environmental exposure to toxic substances, the importance of workplace and occupational history, it is inadequate because it does not address the power relationships of race, class, and gender that dominate our everyday lives" (in Wiley 1992: 220). For Turshen, there is no wholly "natural" disease, as evidenced by the title of the opening chapter in her book about disease in Tanzania, "The Unnatural History of Disease" (Turshen 1984).

The strength of critical medical anthropology is the weakness of ecological anthropology: the politicization of health. Critical medical anthropologists prefer to examine the social and historical forces of political economy as dominant determinants of health and disease; these are, of course, the very realm ecological anthropology is accused of having neglected.[9] "Disease and health are products of the relationship between the producers of wealth and the owners of the means of production, as well as between producers and the distributors of goods and services, because the distribution of resources vital for health – such as housing, food, or leisure – is a function of the relative power of different groups." (Turshen in Wiley 1992: 224). Political ecology emphasizes the need to consider the macro- and meso-level activities of society, i.e. the interaction and interdependence of political and economic factors, and their effects on cultural and social phenomenon. Singer, a proponent of critical medical anthropology,

writes, “Because the restructuring of social relationships can have a radical impact on the health status and health care system of a society, understanding the nature and determinants of social transformation should be issues of central concern to medical anthropology” (Singer 1989b: 230). The assumption that defines this perspective is one shared with Crandon-Malamud, in her study of medical systems in Bolivia, “that medical systems, medical practitioners, and the population served operate and coexist within a political and economic context” (Crandon-Malamud 1993: 32).

Surprisingly, critical anthropologists often feel they must part ways with the political economy of health tradition (Singer 1989a: 1199). This is due to the latter’s tendency to “depersonalize the subject matter (…) by focusing on the analysis of social systems and things, and (…) neglecting the particular, the existential, the subjective content of illness, suffering, and healing as lived events and experiences” (Scheper-Hughes & Lock 1986: 137). Turshen faults her ecological anthropology colleagues for failing “to consider the relation of people to their environment in all its complexity” (in Baer 1990), but she and her political economy comrades forget to consider the individual person in the context of all of their *individual* complexity.

Critical medical anthropologists remember the individual in the context of their historical, political, and economic complexities, but on occasion, those have been emphasized to the exclusion of the biological. Thus, they have been accused of paying “scant attention to ecological factors” (Baer 1996: 129). In critical medical anthropologists’ conception of the individual, as understood in the phenomenological sense of the lived experience of the body-self, “there is no biological organic body mentioned or allowed a reality or history” (Wiley 1992: 222). Critical anthropologists do not doubt that an individual’s mind can affect the state of the body, but there is no opportunity to consider the reverse as possible, that the body can affect the state of the mind (Wiley 1992: 222). Critical medical anthropologists regard science skeptically and are often accused of not having integrated relevant knowledge from the biological sciences into their explanations of human behavior (Steklis & Walter 1990: 137), but medical ecologists have done this, and done it well.

Ecological medical anthropology embraces biological indices. The end goal of ecological medical anthropology has tended to be scientific documentation, model building, and the revision of hypotheses. For this, they are faulted by critical medical anthropologists who often reject ecological medical anthropology for being too closely allied with Western biomedical approaches to health and disease (Singer 1989b; Turshen 1984) and for reinforcing the medical monopoly over an individual’s suffering (Singer 1989a: 1194).

A further difference between the two perspectives is that ecological medical anthropology has “no manifest political agenda” (Wiley 1992: 217). They may observe that the environment was disrupted, but they do not explore *why* the environment was disrupted, by whom, or for what reasons. Instead, they focus only on the process of responding to those changes, i.e. adaptation[10] (Wiley 1992: 223), and how balance, or homeostasis, is restored. Ecological anthropology ignores social ills like misdistribution of resources and power differentials, or couches them as “ills of modernization” without examining the motivation or sources (Singer 1989b). Thus, ecological medical anthro-

pology may be vaguely critical, but it is not explicitly political, nor is such a critique central to its perspective.

This distinctly apolitical agenda stands in sharp contrast to the centrality of the political agenda in critical medical anthropology. Social transformation is implicit and explicit in the research (Wiley 1992: 217). Given the improvement of unjust social relations as a primary objective, there can be no assumption of homeostasis.

Harmony?

In the last several years there have been attempts to resuscitate ecological anthropology.[11] Sometimes, these attempts have come from scholars with a background in critical medical anthropology who see merit in a closer regard of the environment. Baer, for example, has written a very interesting article in which he examines how critical medical anthropology can most productively incorporate the environment into its theoretical model through the incorporation of political ecology (Baer 1996). He suggested the incorporation of political ecology into critical medical anthropology, but did so to the point of ignoring more traditional biocultural ecology in favor of emphasis on the political ecology.

In other instances, ecologists themselves have acknowledged weaknesses in their theoretical orientation. Kottak (1999) writes that "the older ecologies have been remiss in the narrowness of their spatial and temporal horizons, their functionalist assumptions, and their apolitical character." He insists on the need "to recognize the importance of culture mediation in ecological processes rather than treating culture as epiphenomenal and as a mere adaptive tool." Other ecological anthropologists have improved their analyses by simply adding political, historical, or symbolic dimensions to their ecological framework, without explicit reference to earlier ecological perspectives as remiss, or their work as "new." Some theorists have begun a more explicit discussion of the role of New Ecology in the social sciences (Botkin 1990; Lash et al. 1996; Scoones 1999; Vayda & McCay 1975) and anthropology in particular (Biersack 1999; Kottak 1999).

New Ecology is a perspective used in disciplines as disparate as environmentalism, economics, social geography and anthropology that "emphasizes the need to go beyond the restrictive nature-culture or natural and human-influenced divide and focus on the interaction between the socially constructed perceptions and representations and real process of biophysical change and ecological dynamics" (Scoones 1999, see especially 483, 490-496 for further explanation). New Ecology is characterized by three themes: environmental history; structure, agency, and scale; and complexity and uncertainty (Kottak 1999; Scoones 1999). It differs from the "old" ecological anthropology in many areas: policy and value orientation, application, analytical unit, scale, and method. More specifically, the new ecological anthropology blends theoretical and empirical research with applied, policy-directed and critical work, attuned to the political aspects and implications of ecological processes (Kottak 1999). Accordingly, new methodologies have been proposed, ones that study process, examine history (of peo-

ple and their environmental and cultural change), consider the role of political and economic power, and systematically considers feedback among local, regional, and national institutions (Headland 1997: 608-9; Kottak 1999: 31).

Spurned by the criticism of the "old" ecology, new subfields, sometimes called "new ecologies" (Biersack 1999) have emerged. These new ecologies, all with a healthy dose of traditional ecology in their genealogies, include: historical ecology (e.g. Ferguson 1995; Goodman & et al. 1988; Headland 1997), political ecology (e.g. Escobar 1999; Leatherman & et al. 1986; Szurek 1997; Turshen 1984) and symbolic ecology (more a neologism than a new field, e.g. Descola 1994; 1996; MacCormack 1980). These new ecologies could be better termed refinements of previous ecologies, for they are not entirely new. Take, for example, Rappaport's *Pigs for the Ancestors* (Rappaport 1968), a classic example of traditional ecological anthropological theory. It incorporated elements of history (albeit one that was only a decade long) as well as elements of symbolism. Yet these new ecologies are considered quite different in that they "radically depart from the reductions and elisions of the ecological anthropology of the past, and override the nature/culture, idealism/materialism dichotomies that informed and enlivened the debates of the past" (Biersack 1999).

The reexamination of the ecological anthropological perspective has been fruitful and a source of invigoration for much research; yet I remain unsatisfied with even the recent ecological anthropology metamorphosis for two reasons. The new ecological analyses still focus on the way the ecology (in the sense of the physical ecosphere) *affects or has been affected* by social forces (Brosius 1999; e.g. Gezon 1999; Kottak 1999). I propose to elevate the position of politics, economics, and symbolic systems a notch higher in the framework, and consider politics *as part of* the environment. I believe that these social forces *in and of themselves* contribute to our health or lack thereof; it is not necessary to consider the environment as a mediating factor through which politics works. Secondly, I do not wish to focus *exclusively* on the symbolic, or the political, or the economic, or the historical, in the way the new ecologies have tended to. As ambitious as it may be, I propose to consider all of these ideological components as equally important determinants of the individual's environment (see too Brown et al. 1996: 217-8 and Wolf 1999: 22). After all, holism is one of the pillars of anthropology; we owe it to our discipline and our informants to at least attempt it.

I conclude this first section by touching on a contentious final concept for the two perspectives: adaptation. Medical anthropologists of many a theoretical persuasion have found the term "adaptation" to be important (Brown et al. 1996), but critical medical anthropologists reject the concept as immaterial. Ecological medical anthropologists define adaptation as "changes and modifications that enable a group or a person to survive in a given environment" (McElroy & Townsend 1998: 96). While the ecological anthropologists McElroy and Townsend believe adaptation is a "core theoretical concept of the field [of medical anthropology]," Singer, a proponent of critical medical anthropology, critiqued adaptation as a "useless concept because it could not incorporate the role of social relations in explaining health-related behavior" (Singer in Wiley 1992: 216). Though I disagree with him that it is "useless," there are certain weaknesses that must be acknowledged.

There is potential for tautology in the notion of adaptation, "what is adapted is there, and that which is there is adapted" unless there is an independent measure for adaptation. For ecological medical anthropologists, this measurement is defined as health. They posit that we constantly strive for homeostasis in our environment; the achievement of balance with our environment is reflected in good health. Disease, therefore, becomes an indication of lack of equilibrium or maladaptation. When we are ill, we are out of balance, or not at ease with the environment, hence, "dis-ease" (Van der Geest: pers. comm.). It is, however, dubious whether ecological medical anthropology's reliance on health status is an appropriate measure of adaptation. It is a short step to blaming the victim (i.e. the sick person) for failing to adapt, says Singer (1989b), with which I agree. Furthermore, adaptation needs to be rescued from the rather outdated, narrow individual moral basis (Van der Geest: pers. comm.).

I prefer the definition of adaptation put forth by Wiley, "the ability to respond to or seize opportunities, which in turn is circumscribed by the resources (material and biological) available to the individual or group" (1992: 228). Utilizing such a definition, we can examine what the *limitations* to their responses are, *if* people are able to "adapt" at all, and, if so, we can examine *how* they manipulate their total (biological, social, political, etc.) environment to maximize their interests. Thus, illness is no longer a failure to adapt, but a product of a certain environment of pathogens, ideas, history, biases, and resources.

How does adaptation work? Is it conscious or unconscious? Is it planned, or do our behavior and phenotypes simply morph, or evolve, seemingly of their own volition? Does our environment change us, or is there an element of choice in how we react, i.e. do *we* change us? Adaptation exists at many levels, from the molecular to the behavioral; we need to specify the definition of adaptation for it to be a meaningful concept for critically- as well as ecologically-oriented medical anthropologists.

From a biological standpoint, changes to our physiological, morphological, and cultural characteristics to enhance survival in given habitats have been termed "adaptive strategies" (McElroy 1990: 249). Yet as a functional concept, an adaptive strategy does not necessarily imply that human behavior and customs are the result of conscious planning, or trial and error, to reduce disease or to increase well being.

Social scientists have written of strategies as well. I quote at length from Scheper-Hughes's discussion of the struggles and strategies of poor men and women living in the Alto, a hillside shantytown in Brazil (1992: 471-2).

> "Although I have occasionally used the word 'strategy' with reference to the daily practices of the women and men of the Alto, perhaps the time has now come to disown the term with all its biologic and militaristic overtones. For the people of the Alto do not really strategize."

She then turns to the treatment of the strategic metaphor by Michel de Certeau,

> "[Strategy] implies that people are consciously organized or prepared for action. It suggests they have a clear-sighted vision of the lay of the land and a certain knowledge of the 'enemy' that they can look (optimistically) toward the future, and that they can plan toward an upset victory. But this is not the reality in which the *moradores* [residents] find

themselves. Their daily lives are circumscribed by an immensely powerful state and by local economic and political interests that are openly hostile to them. A strategy implies a base, a starting point, a specific location, one that is also a locus of power."

Following Michel de Certeau, Scheper-Hughes substitutes "tactics" for "strategies" as a better description of the everyday, oppositional survival practices of the poor. "Tactics are defensive and individual, not aggressive and collective, practices. They should not be confused or conflated with the domain of 'resistance' that James Scott (1985) and his colleagues have done" (Scheper-Hughes 1992). Tactics are daily acts to better improve one's existence, and are thus not so very different from the behavioral definitions of adaptation.

Borrowing heavily from Scheper-Hughes's discussion of tactics, (and flirting with some ideas of transactionalist medical anthropology) I have defined adaptation in a manner that is amenable to both perspectives. I can preserve the concept of "adaptation," but will speak of *tactical* adaptations, actions and reactions to an environment in which and through which people seek the best life that they can. Tactic implies volition, even if it is a circumscribed one, while adaptation alone often entails passivity or unconscious motivations. Discussion of tactical adaptation entails consideration of the adaptations that are possible, the factors that are too immense to struggle against and would only defeat health, and an analysis of which of these possible adaptations are most worth fighting for.

A second feature of such a tactical adaptation is that it must no longer be solely a physical one. Culture has long been considered our most powerful tool for adaptation; to speak of culture helping us to adapt to our environment is no revelation. As anthropologists, we have long ceased to marvel at mankind's consummate adaptability, ever since we first learned about the warm, dry houses that culture has enabled us to learn to build in order to protect ourselves from the harsh environment during our introductory anthropology classes. The potential for this cognitive adaptability has only begun to be considered (Van der Geest: pers. comm.), and unexpectedly, it is critical medical anthropologists who have done so. "Emotions do not precede or stand outside of culture; they are part of culture and of *strategic* importance to our understanding of the ways in which people shape and are shaped by their world" (Scheper-Hughes 1992: 431, my emphasis). Cognitive adaptation means we can change the way we think about things, such as health, in order to put our selves at ease. The consideration of babies' deaths in the *favela* as blessings could be considered one such example, albeit an extreme one, of cognitive adaptation (Scheper-Hughes 1992: 429-45). Medicine is another such domain in which cognition plays an important role, "[medicine] is a domain in which meaning is created and negotiated and reformed" (Crandon-Malamud 1993: 205).

A critical ecological schematic

In summation, ecological medical anthropological perspectives are appealing because of their potential for holism, though the political and economic aspects of health are

often neglected. Critical medical anthropology has a strong political and economic component, but, at times, emphasizes the historical, political, symbolic and economic dimensions of health to the exclusion of the biological body. While ecological medical anthropologists may succeed in remembering the biological body, they may perceive the causes of its illnesses uncritically or at least apolitically, while critical medical anthropologists have situated social transformation centrally in their research. The idea of adaptation, so vital to ecological medial anthropology, is avoided by critical medical anthropologists, but by adding tactical and cognitive dimensions to it, can be rescued and used in both perspectives.

In light of what I consider the merits and shortcomings of critical medical anthropology and ecological medical anthropology, I have fashioned a framework that gathers the best from both bodies of knowledge. The most salient characteristics are:

1 a broader definition of the environment to include historical, political, economic, biological and symbolic forces;
2 an expanded definition of adaptation to include the notion of tactical adaptations;
3 social transformation as a goal.

These characteristics can be depicted within a framework borrowed from ecological anthropology. Ecological anthropology often incorporates simple (perhaps overly so) diagrammatic models that can help to chart almost any setting. These diagrams are an excellent heuristic tool for both organizing important influences on health as well as visualizing how they interact. Such schematics can also facilitate comparison between environmental features of other settings. The graphic representation I have created for the CEMA framework borrows heavily from a diagram in *Nutritional Anthropology*, "An Ecological Model for Nutritional Anthropology" (Jerome et al. 1980: 14), albeit with some significant adjustments.

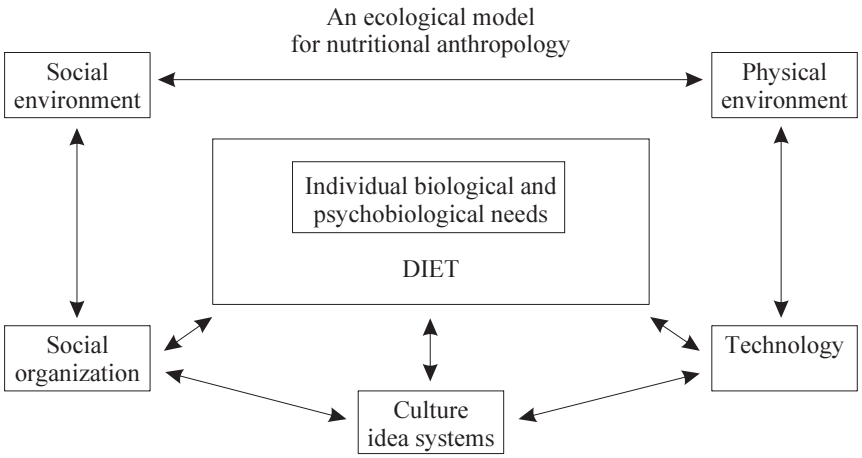

Figure 1 *An ecological model for nutritional anthropology(Jerome et al. 1980: 14)*

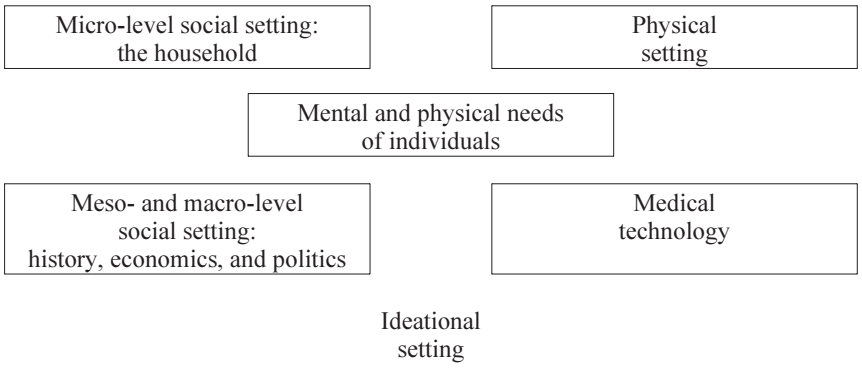

Figure 2 *A critical ecological model for medical anthropology*

Food is not at the center of my diagram, as it is in Jerome, Kandel, and Pelto's diagram; the individual is. This model is meant to help us to understand the environment in which we live, not only the environment in which our food is produced and consumed. A second reason for the centrality of the individual is the importance of the concept of adaptation; it is as individuals that we act and react (though these actions are, of course, mediated by our social environments). This construction seems acceptable to both perspectives, as both are occupied with how individuals respond to threats directed at their well-being within the particular parameters of said environment.

In the *Nutritional Anthropology* diagram, "social environment" is "the effects of other societies' food production"; "social organization" refers to the "economic and political structures, and micro-level features of household structure"(Jerome et al. 1980: 14-5). I have redefined what these are comprised of. In my diagram, "social environment" is the meso- and macro-level social setting (which was absent from their diagram), i.e. the political, economic, and historical environments on a state and global scale. "Social organization" in the *Nutritional Anthropology* diagram refers to the micro-level social setting; I have re-titled this in the CEMA perspective with a new title, but have not changed that which it refers to: household organization. What was, "culture and idea systems" has been re-titled "ideational setting." "Culture" is no longer compartmentalized whatsoever; it is found throughout the whole diagram, as it permeates each individual life. Each sub-frame is an integral part of the entire environment a person lives in, and each constantly acts with and reacts to all of the other smaller boxes, a response to Frankenberg's entreaty to "demonstrate clearly what effects are produced at the local level, by national and international social processes; and what is coming from the local level in return" (in Singer 1987: 1200). To draw this accurately, arrows would have to fly every which way. I have drawn no arrows, but have represented the environment, the space in which these small boxes interact, by drawing a large frame that encompasses the entire diagram. Thus, all components are equally open to change and to be changed by the other factors in the environment. Note that this too is a differ-

ence with the *Nutritional Anthropology* diagram, in which each peripheral box interacts only with certain other ones.

Ethnographic flesh on theoretical bones

As outlined above, the first of the three salient features of a critical ecological medical anthropology perspective was the inclusion of tangible and intangible settings at equal levels of importance to demonstrate how factors like history, politics, and household structure can and do affect one's health as much as the topography and physical needs and limitations of the body do. It was important to present information about the environment that, at first glance, may seem immaterial to anemia, such as information about who does the marketing or how the infrastructure has been crumbling, and why. But if I had only included discussion of aspects the physical environment, i.e. the ecological approach at its narrowest, the influence of politics and history would have gone unappreciated. If I had focused only on the political oppression and gender inequalities, i.e. critical medical anthropology at its narrowest, then information about the biological requirements during pregnancy and the contribution of infectious diseases to malaria would have goon unnoticed. Careful analysis reveals that all of this information is, in fact, germane.

Thus, a satisfactory ethnography of anemia during pregnancy on Pemba must include a history of Omani and British colonialism in Zanzibar, with an emphasis on their policies towards health care, in order to demonstrate the distrust and miscegenation that have shadowed hospitals since the first one opened. It also includes some discussion of natural resources, e.g. the monocropping of the once-profitable cash crop, cloves, and the misdistribution of land after the 1964 revolution to explain why Pembans do not grow enough food to feed themselves. Poor sanitation, which exacerbates the spread of worms, and an untimely end of malaria control in a holoendemic area contribute to the prevalence of parasites which cause blood loss and red blood cell destruction, and in turn, anemia. A discussion of recent politics, such as the violent elections in 1996 and 2001, in which Pembans were singled out for injury and murder, begins to explain why Pembans feel that medicines are another form of political oppression and are thus skeptical of their benefits. The economic strife due to the drop in clove prices, structural adjustment programs, and the withdrawal of NGO's because of governmental corruption, sheds light on why the entire archipelago's infrastructure is crumbling, with concentrated effects on Pemba. The dominant gender ideology on Pemba, which encourages women to be passive, stoic, and obedient, often translates into women suffering silently through very painful conditions. Beliefs about when it is appropriate to eat nutritious, "blood-giving" foods during pregnancy and the postpartum period most certainly negatively influence women's hemoglobin status. All of these environmental factors, and even more, are essential to understanding why anemia is the problem that it is during pregnancy.

In the diagram below, my favorite heuristic device from ecological anthropology's toolbox, I have recapitulated some (but not all) of the elements of the environment im-

portant to understanding anemia during pregnancy. Not all that are included have been explained in the ethnography, but a sufficient number have for the reader to see the way in which the schema was used. Such a flexible tool helped me to orient my analysis as I learned of more and more aspects of Pemban culture that contribute to the prevalence of anemia during pregnancy. The critical ecological medical anthropological framework is able to display and summarize the most important categories of data, though by no means is it exhaustive or subtle; nor is it meant to be. The emic perspectives of anemia and pregnancy are arranged next to historical, political, economic, and ideational environments, in order to create an etic understanding of why anemia poses the serious health risk that it does during pregnancy in Pemba. It should now be clear that it was impossible to study anemia in Pemba without studying Pemban culture in its entirety, and that the critical and ecological perspectives were imperative to doing so.

A Critical ecological model for anemia during pregnancy

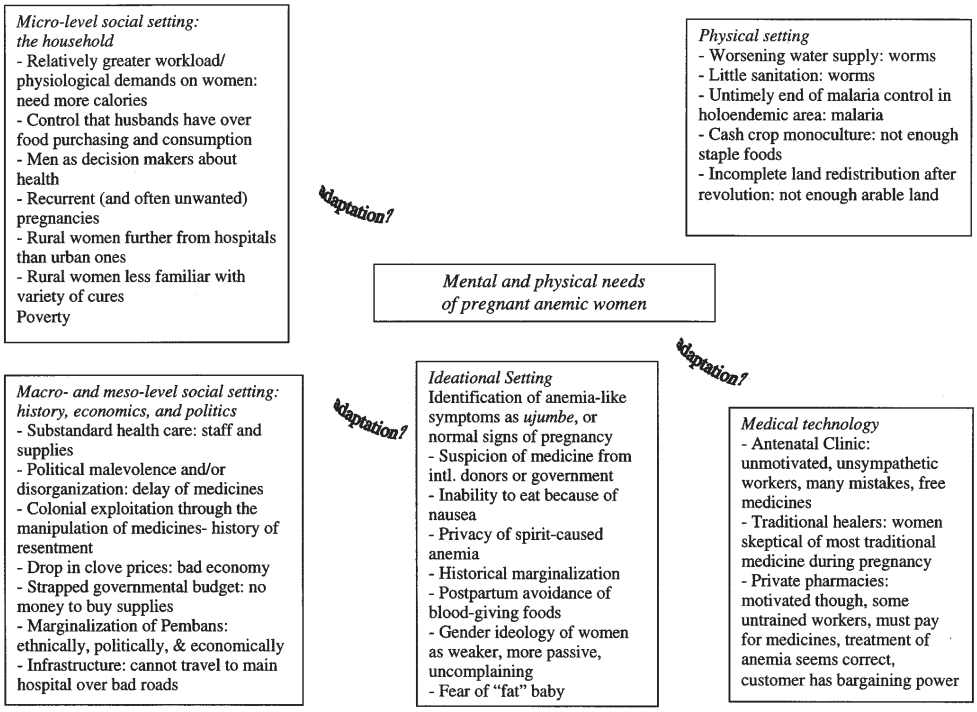

Figure 3 *A critical ecological model for anemia during pregnancy*

The compartmentalization of the box renders the factors more separate than they actually are. One can become caught up worrying if sanitation goes under "physical set-

ting" or "social setting," or if the priority men are given when eating fits under the "micro-level social setting" or "ideational setting." The answer is that those factors fit under both headings, but that in the end, it does not matter so much; this is not a literal representation but one with heuristic value. Another weakness of such a schematic is that it renders Pemban culture deceptively straightforward. It is not. Despite the potential for oversimplifying culture, I felt that it was edifying to include the diagram without the ethnographic description that normally accompanies it.

Understanding what is in the environment is one aspect of the CEMA model, and the first step to understanding how the individual acts and reacts within it. The second facet of the CEMA perspective was the broadening of the term adaptation such that it took on tactical and cognitive possibilities. When the environment is laid out for us, the areas of change, action and interaction, i.e. adaptation, become clear. "Until we fully realize that social process in the medical arena is shaped not by the unrestrained will and might of potent oppressors but by an ongoing clash between those best served and those least served by existing medical institutions and between those most in control of and those least in control of medical knowledge, procedures, and technology, we will misunderstand [clinical process]" (Singer 1987: 1199). Change is not unidirectional.

In a model that considers all the constraints and possibilities within their environment, we can see how Pemban mothers-to-be accommodate or cause elements in their environment to adapt to meet their health needs. I believe that there are three realms within which a woman can tactically adapt to, or cause to adapt to her needs. These are denoted with the linkages "adaptation?" in Figure 3 above. I am not convinced, however, that pregnant Pemban women can elicit much change at either the macro and meso-level social setting, or at the level of her physical setting. Perhaps she *can* negotiate a few adaptations in the household setting: she can figure out how to better get permission from her husband to go to the clinic, private pharmacy, or traditional healer. She could devise ways of having enough money to afford medicines and/or transportation to care. She can get this money either from her husband or through small enterprises she does on the side, such as selling foods or extra crops. Lastly, she can try to eat more nutritious food. She could do this by growing more food herself, convincing her husband to purchase more nutritious foods when he does the shopping, or persuading him to share more of the scant protein that they do have.

The second realm for potential adaptation is that of her ideational environment, e.g. what she considers as illness and what she considers as health. If she learns more about anemia she can more easily distinguish between *ujumbe* and signs of anemia. Additionally, her perceptions of what is acceptable behavior for a woman may now keep her from insisting that her symptoms are unreasonably unhealthy. She may begin to consider treating spirit-caused anemia with iron supplements as well as with traditional cures. She may come to realize the value of nutritious, "blood-giving" foods during *ujusi*, the postpartum period lasting approximately forty days, instead of avoiding it as most women do now.

A final realm for adaptation is that which is labeled "medical technology" in Figure 3. Pregnant Pemban women can make better or different use of the medical tech-

nology at hand, i.e. the antenatal clinics, non-hospital medicines, and the private pharmacies. She could become more of an active participant in her diagnosis, by clearly explaining her symptoms when asked, instead of answering the doctors' and nurses' questions with monosyllabic replies and embarrassed silence as is presently the norm. She could seek medical treatment earlier, which necessitates changing her ideational environment, i.e. learning to recognize when symptoms are grave enough to merit treatment. She could ask more questions when she is at the antenatal clinic, and she could be more assertive about knowing what her diagnosis is, i.e. comprehending what it means and understanding the proper treatment thereof. Alternatively, she could seek assistance from a place where she has more bargaining power as a paying customer, where she is served by those who she feels comfortable with, who can diagnose her on the spot, without long waits and excruciating interviews, i.e. the private pharmacy.

Adaptation, framed as such, brings us only a few short steps away from the third tenet of CEMA, that of social transformation. If we better understand how a Pemban woman perceives her health, constructs her health, and seeks health, and the tangible and intangible environment of ideas in which she does this, then we can better understand how to make tools better available to her, or help her to realize what tools are already at hand, to facilitate her maneuvering through the vulnerable time of pregnancy as an already marginalized citizen.

All of these suggested adaptations require a woman to recognize that she can empower herself. This shoots straight to the heart of critical theories: a critique of ideology and power. "Ideologies can mystify reality, obscure relations of power and domination, and prevent people from grasping their situation in the world… When institutional arrangements and practices reproduce inequality, domination, and human suffering, the aims of critical theory are emancipatory" (Scheper-Hughes 1992: 171).

In pointing out all that women can do to improve their health, there is a potential for an accusatory tone. I am not implying that Pemban women are anemic because they have failed to adapt; shedding the moral overtones that can accompany more traditional ecological anthropology was one of the goals of reworking the term adaptation. There is a certain danger in assigning such control. "[I]n granting power, agency, choice and efficacy to the oppressed subject, one must begin to hold the oppressed morally accountable for their collusions, rationalizations, 'false consciousness' and more than occasional paralyses of will. With agency begin responsibility and accountability" (Scheper-Hughes 1992: 533). My intention is not to blame women for not trying hard enough; my intention is to acknowledge a degree of agency in women who do not necessarily think of themselves as having a say in their health, reproductive or otherwise.

In this final section, I hope to have demonstrated that the prevalence, perceptions, and treatment of anemia during pregnancy are embedded in all facets of the environment of Pemba, thereby justifying my claims for the necessity of an all-encompassing environment. During the discussion of adaptation, I have made explicit the ways in which this environment changes and is changed. Finally, by suggesting a tactical adaptation or two in light of unsupportive governments and husbands, I have dabbled in social transformation.

In closing, I return to the original goal of this article: making transparent the *process* of selecting aspects from various theoretical frameworks, and then using those to analyze one's fieldwork. I am curious if other scholars accept that I have indeed, as I have argued, fruitfully harmonized two seemingly discordant bodies, and if so, if that is sufficient for a successful analysis. I am even more interested to know how other medical anthropologists have selected the theories they use in their work. I invite other scholars to reveal their processes of theoretical bricolage, and their justification for these choices. Such an exercise is guaranteed to make one's analysis more comprehensive, lucid, and meet the anthropological priorities that we have set for ourselves no matter what our theoretical orientation.

Notes

Sera Young graduated with a Bachelor's degree in anthropology of religion and education from the University of Michigan in 1999, and with a Master's degree in Medical Anthropology from the University of Amsterdam in 2002. This article is based on portions of her thesis. She has been to Zanzibar for language study and research on a number of occasions since 1999, and will be returning to continue her study of health and quality of life during pregnancy in January 2003. She may be contacted at seralewise@yahoo.com.

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1 Severe anemia is defined as levels of hemoglobin (Hb) less than 70g/L, mild anemia as Hb between 110g/L and 70 g/L.
2 In 1977, ASP merged with the mainland's sole political party, TANU, to form the *Chama cha Mapinduzi* (the Revolutionary Party, or CCM). By this time ZPPP and ZNP had united to become Civic United Front, or CUF.
3 The whole of this section draws heavily from Arnold and McKim's report (2001).
4 The Bamako initiatives have not been introduced in Zanzibar.
5 Contrast this governmental control of medicines with Turshen's assertion that the government has given up a measure of independence for the health care system because of its external financing and management (Turshen 1984: 204).
6 In 1981, a pharmaceutical plant began operation near the main hospital. Because of technical, financial, and administrative problems, it is no longer operational. But even when it was, the shortage of medicines was still severe (Nisula 1999: 200).
7 For more extensive discussions of spirits in Zanzibar, see Larsen 1998, McGruder 1998, and Nisula 1999.
8 Animal products are the best sources of iron as they are both relatively high in iron and the iron they contain has high bioavailability, such that about 20% is absorbed. The bioavailability of iron in plant sources is only about 2 to 5%. Phytates, found in unprocessed grains are strong inhibitors of iron absorption, as are polyphenols in legumes, tea, nuts and coffee, and oxalate in green leafy vegetables.

9 For a discussion of the place of history in ecological anthropology, see Headland 1997 and Turshen 1984: 18.

10 Political change is not high on agenda, but change is central to the field as adaptation is central concept.

11 The New Ecology may not be so new; note the article from 1970 that makes references to the New Ecology.

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