AN EPIDEMIC OF PRIDE: PELLAGRA AND THE CULTURE OF THE AMERICAN SOUTH[1]

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Abstract: A large epidemic of pellagra, a nutritional deficiency disease of the B vitamin, niacin, broke out in the American South in the early 1900s. In epidemiological and nutritional literature the discovery of niacin and the conquest of pellagra are often portrayed as straightforward medical victories. However, when the true etiology of the disease was first discovered by Dr. Joseph Goldberger (a New Yorker), his results were angrily denounced by southern physicians, legislators and the general public. Nearly 20 years elapsed before his conclusions were finally accepted and a co-ordinated public health effort was begun. The reasons for this irrational Southern response are specifically related to the cultural identity and values of the South at this time. Parallel exploration of the history of the pellagra epidemic and the unique culture of the South provides powerful insights into how culture can negotiate the acceptable parameters of scientific research.

Résumé: Au début du siècle, une grave épidémie de pellagre, maladie due à une carence en vitamine B, la niacine, a éclaté dans le Sud américain. Dans la littérature épidémiologique et nutritionelle, on a souvent dit que la découverte de la niacine et l'enraiement de la pellagre n'étaient que de simples victoires médicales. Cependant, lorsque, le docteur Joseph Goldberger (un new-yorkais) découvrit les véritables causes de la maladie, ses résultats furent décriés par des médecins du Sud, des législateurs et le public en général.

Il fallut près de vingt ans pour que l'on accepte enfin ses conclusions et que l'on assiste à des efforts coordonnés dans le domaine de la santé publique. Les raisons de cette attitude irrationelle, de la part des gens du Sud, sont précisément liées à l'identité et aux valeurs culturelles du Sud de cette époque.

Un approfondissement, à la fois de l'histoire de l'épidémie de la pellagre et de l'unicité de la culture de Sud, offre une meilleure compréhension de comment la culture peut disposer des paramètres acceptables de la recherche scientifique.

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> If some day last July, you had happened to visit the State Hospital for the Insane at Columbia, South Carolina . . . you might have stood by while the doctor loosened the bandages from the foot of a young negress, and as you saw the horror of it, and heard "Show the other one, this isn't the bad one," you might have put all your firmness as I did, into the words "Doctor, I don't want to see the other foot—I have seen enough—all I can—right now." And you would have hurried through the corridor to reach the sun and air with the tragedy of those lives smothering your heart and the eternal mystery of pain surging through you in the question, "Why must a sentient human being suffer this?" And for many hours the world would have been dark with inscrutable purposes and appalling punishments. For you have seen the disease that is more to be dreaded than smallpox, than leprosy, than the black death—you have seen pellagra. . . .
>
> — Marion Hamilton Carter,
> *McClures Magazine*, 1909

Introduction

Niacin is a water-soluble member of the B vitamin family. It functions as a co-enzyme, assisting other enzymes, such as those associated with the metabolism of proteins, fats and carbohydrates. It is especially vital to the maintenance of the nervous system, skin and digestive tissues (Kirschmann 1975). Pellagra is the deficiency disease resulting from long-term insufficient niacin (as well as its amino acid precursor, tryptophan) intake. A diet high in unenriched corn has been shown to interfere with the conversion of tryptophan to niacin (Etheridge 1972:216), thus increasing the chance that any corn-dependent, nutritionally stressed population will incur the disease.

Outbreaks of pellagra were first noted in the southern United States around the end of the 19th century. By 1910, it was regarded as a full-fledged epidemic—with the subsequent fear and hysteria. The progression of the disease was particularly unpleasant, and often referred to as the "four Ds" (diarrhea, dermatitis, dementia and death). Some thought it related to leprosy and many of the victims were shunned (Etheridge 1972:30). Mortality estimates range from 15 000 to 60 000 in the years 1915 to 1920 alone (see Etheridge 1972:113 and passim). However, these statisitcs should be considered only a small fraction of the total number of cases—first of all, many afflicted areas of the South were rural and very isolated; most South-

ern physicians would not treat blacks (Bousfield 1934) and reporting the disease was not mandatory in every county. Certainly thousands more suffered undiagnosed and untreated (Wood 1909; King 1921).

The conquest of pellagra and the discovery of niacin in the United States were not straightforward scientific triumphs, as some medical historians would imply (Wilson 1953; McCollum 1957). Although the mobilization of resources for research, and the research effort itself, were exemplary, the subsequent response of the health care system was meagre and ineffectual. In 1914 and 1915, Dr. Joseph Goldberger unarguably demonstrated pellagra to be caused by dietary inadequacies (Goldberger 1964a,1964b). Southerners violently rejected these conclusions (Etheridge 1972) despite the overwhelming evidence to the contrary. Many Southern physicians, public officials and public health workers defiantly insisted that pellagra was not nutrition-related at all, but caused by infectious agents or mouldy corn (Roe 1973:58,86-88; Etheridge 1972:11). As a result, almost 13 years of fruitless and unnecessary research on viruses, sewage, insects and maize passed before Goldberger's ideas were finally accepted. During this time, only isolated steps were taken to alleviate the crisis or to improve the health of the heavily afflicted rural population. Even after poor nutrition was unanimously admitted to be the cause (around 1928), public health departments were still slow to react. It was not until the 1940s that pellagra was completely eliminated (Roe 1973). An estimated 600 000 people died and over 1.5 million more were afflicted during the long interim between Goldberger's discoveries and the initiation of an appropriate public health effort to eradicate the disease.[2]

The story of pellagra in the United States has been looked at historically (Etheridge 1972; Roe 1973), and epidemiologically (Terris 1964) but, to my knowledge, no one has yet examined it from a nutritional anthropological perspective—in other words, no one has asked the question "how did the surrounding culture of the South in the early 1900s affect the course of this epidemic?" Investigating the story of pellagra in the United States from this angle provides a powerful opportunity to explore how cultural processes intervene in health and disease issues and to investigate this potential interplay between culture and biology.

Specifically, this paper will be devoted to analyzing the seemingly inexplicable reluctance of the South to accept Goldberger's findings and its subsequent failure to initiate an appropriate response. Why was there such a furor over Goldberger's conclusions? What rationale did the Southern physicians use to justify their intractability? And, finally, in regards to the nutritional anthropological paradigm, how was the specific culture of the South responsible for negotiating the scope and direction of, as well as the response to this particular nutritional disease?

The first major section of this paper will be devoted to a chronology of the epidemic itself. The second major part will analyze the specific culture of the South in an effort to determine what exactly was responsible for this seemingly irrational denial of Goldberger's discoveries. It is my contention that the history of pellagra in the United States graphically illustrates the powers of culture, economics and politics to construct and define the acceptable domains of medical initiative. The story of the conquest of this disease in the United States will serve as a powerful testimony to the abiltiy of cultural forces to abort or deny unpopular scientific discoveries.

Prelude

> Sometimes it don't seem possible that we're living at all, especially when I wake up in the morning and see the children getting up... and dressing in the kitchen where there's hardly a crumb of food. They make a fire in the cook-stove and I scrape together a little cornmeal, when there's any to scrape, and I cook it with salt and water. Once in a while we have some molasses, or maybe just some sugar-water to eat with it.... A lot of times I've just sat and wondered if there's anything else in the world to eat.
>
> — Sharecropper's widow,
> Peterson, Alabama, 1930s

> ... if the government doesn't do something about the losing cotton farmers, we'd be doing them a favour to go and shoot them out of their misery.
>
> — Anonymous banker,
> Augusta, Georgia, 1930s

The economic foundations of the antebellum South were basically left intact after the Civil War. Although much of the region's wealth was lost through the war effort, the pre-existing agricultural and political patterns still prevailed. Landowners who were still firmly enmeshed in the plantation mentality regained control over many of the state and local governments through compromises with the Grant administration (see Stampp 1965:186-215). Despite the passing of the Fourteenth and Fifteenth Amendments, within little more than a decade after the Civil War the negroes of the South were abandonned to the control and rule of that very class which had regarded slavery as a Divine Institution and had fought the North for four years in order to preserve it.

Since slavery was outlawed by the constitution, the South adopted a different yet equally exploitative labour system — sharecropping. Landlords

would furnish a mule, half the fertilizer and half the seed needed for one year. Tenants mortgaged their prospective crop yields; if prices fell or crops failed, they could not repay the landlord and would go deeper in debt. When they did obtain a crop, they would often be given vouchers for the plantation store rather than cash. The only other stores within reasonable distance were on neighbouring plantations. One census report showed that 70 percent of the cotton-producing farms in Georgia were occupied by tenants (Keasby 1915).

More often than not landlords would take advantage of the illiterate tenants—at the end of the year, many would find that their debt had mysteriously increased while their incomes continued to decline. (See Caldwell and Bourke-White 1937:52-55.) When tenants asked to leave the notorious Harris plantation on the Delta, they were asked to pay a fee of $50 (about one year's earnings). If a tenant left without asking, he was subject to arrest and forcible return to the plantation—supposedly for "skipping out on a debt" (Caldwell and Bourke-White 1937:55).

The whole economy of the South was based on the cultivation of one single, labour-intensive crop and on the exploitation of an uneducated rural underclass. Sharecroppers were completely at the mercy of their landlords. Most tenant farmers were not allowed to grow any food crops for their personal use. Since the soil continued to decline, more and more cotton had to be planted and food production became almost nonexistent. One traveller in the early 1920s described the scene as follows: ". . . almost never did I see a garden, a pasture, a haystack, a potato field, a flock of hens, an orchard, a dairy, an oat field, or anything else but tens of thousands of squalid huts and acres and acres of cotton" (Snyder 1924).

Since tenants grew no food (except a little corn), they were dependent on plantation commissaries. These stores carried little besides cornmeal, bacon and molasses—most sharecroppers couldn't afford anything else, and shopkeepers did not want to stock items they were unlikely to sell (Roe 1973). "Everything the cotton grower needs for his home . . . and his crop he must buy. . . . One and only one source of income has he; if it fails he has none. Hence the great need of credit and stupendous debt that ever hangs over the cotton belt" (Snyder 1924).

Blacks were by far the most exploited class of sharecroppers, but poor whites suffered equally in terms of food. White plantation owners preferred black tenants over white because they were easier to intimidate and exploit (Caldwell and Bourke-White 1937). As a result, whites were evicted from many productive plantations and forced to move onto the most marginal, eroded lands. Blacks at least had the *ability* to grow their own food, if the plantation owner would allow. This also served to heighten racial hatred and

violence from the poor whites, and effectively prevented the formation of any political alliance among sharecroppers.

This stubborn insistence on monoculture degraded the soil at an astounding rate. By the early 1910s, crop yields had withered, cotton prices fell, boll weevils invaded, food prices rose and the South found itself in a severe agricultural depression (Snyder 1924). People who for years had been marginally nourished suddenly found themselves with less than ever before. There was no public assistance. The epidemic of pellagra that followed was merely a final manifestation of the degradation inherent in the old plantation system that the landowning class had tried to resurrect.

Pellagra

> . . . reddish spots appear upon the epidermis and small tubercules rise up; then the skin becomes dry, the surrounding coats burst, the affected skin falls in white scales . . . finally . . . [all] parts of the body exposed to the sun become repulsively disfigured. . . . The patients begin to have trouble in the head, fear, vertigo, fluxes in the bowels and mania. . . . [They] are consumed with a ghastly wasting.
> — Italian physician, Francisco Frapolli, 1771
>
> Acute pellagra is a death-dealing pestilence.
> — Dr. Edward Jenner Wood, 1900

The initial dramatic outbreaks of pellagra in the United States occurred from around 1905 to 1910 (McCollum 1957). Before then the disease was known only in Europe, where large-scale epidemics were first recorded in the mid-1700s. The disease went by the names *Mal de La Rosa, Mal de La Misera, Dartes Malignes* and, finally, *pella agra* (meaning literally "rough skin"). Although it was found in several European countries (Spain, Romania, Austria and France, for example), Italy was the only one in which the disease reached truly epidemic proportions (Wood 1909). One Italian physician estimated that by 1784 nearly one-twentieth of the population of Lombardy was pellagrous and, in the worst districts, one in every five or six individuals had the disease (Roe 1973:39).

One common factor noted in all pellagra-dense areas in Italy was a diet based on polenta, a cornmeal mush. This led Italian researchers to believe that corn consumption was responsible for the disease — not because of any inherent nutritional deficiency but, rather, because of fungi or bacteria growing on spoiled corn (Roe 1973).

The belief in rotten corn persisted in the United States. When pellagra first broke out in the early 1900s corn was implicated as the culprit. A full-page article in the Sunday *New York Times* led off with the warning, "If You Fear Pellagra Beware of Corn"(September 5, 1909). Other ensuing articles stated: "Pellagra is caused by an intoxication from eating corn that has been altered by fermentation" (October 24, 1909); "everywhere it seems that corn is charged with the responsibility for the disease" (October 31, 1909). There were some flaws to this theory, however. One journalist pointed out that the Indians subsisted on corn and never succumbed, and some (although few) pellagra patients claimed to have never or rarely eaten corn (Wood 1909).

Several alternatives to the corn theory were proposed. Pellagra had a specific tendency to appear in the spring, as a result of dietary deprivation during the winter. This led some to believe that it was transmitted by seasonal insects. Others noticed the high concentration of pellagra within certain families and insisted that it must be hereditary. Still more felt that it was infectious, due to its localized appearance in certain neighbourhoods, orphanages and asylums (Etheridge 1972:30,31). Perhaps the most creative theory was proposed by a Kentucky physician who declared pellagra to be spread by migrating robins (*New York Times*, June 8, 1912). Overall, the majority of physicians were fairly evenly divided between the corn and infection theories (McCollum 1957).

By 1912, there were two main bodies of researchers working on pellagra. One was the government-sponsored Pellagra Commission, appointed by the Surgeon General. The other was the privately funded Thompson-McFadden Commission. The government commission suffered greatly from lack of funding and was, for the most part, ineffective for the first few years. The chief researcher, Dr. Claude Lavinder, complained of a "fearful stringency in the government's finances" (Etheridge 1972:45), such that the spending of $15 or $20 on laboratory rabbits became a serious issue. The Thompson-McFadden Commission, by contrast, was extremely well funded. Two philanthropists donated $15 000 to study the disease—enough to set up an excellent laboratory and even buy a car (*New York Times*, May 26, 1912).

By 1914, the Thompson-McFadden Commission had concluded that pellagra was more than likely an infectious, insect-borne disease. The sable fly, the bedbug, the louse and the housefly were all considered likely candidates. They based this reasoning on the close proximity of cases within certain neighbourhoods (Terris 1964). Lavinder, of the Public Health Service, had attempted to follow up on the germ theory by inoculating monkeys with the injection of material from a pellagrin. His repeated failure turned government researchers toward a new (but still wrong) direction—since pellagra

was not transmitted by germs, they reasoned, it was perhaps caused by an error of metabolism (Etheridge 1972:60).

The turn in the course of the pellagra investigations came in 1914. First of all, the Public Health Service revoked its meagre funding and financed a new study with the generous sum of $80 000 (quite a significant amount, considering that the entire U.S. public health fund was only $200 000). Forty-one people were put in the field to study every possible aspect of the epidemic. Secondly, the disenchanted Dr. Lavinder requested other work and was replaced with the soon-to-be legendary Dr. Joseph Goldberger (Etheridge 1972:65).

Despite the prevailing climate of epidemiological opinion, Goldberger managed to look at the situation with a fresh and unbiased eye. As a New Yorker, he had the advantage of being an outsider—the diet of poor Southerners (consisting mainly of cornbread, molasses and, occasionally, fat bacon) looked very strange to him and took on a special significance. Within three months, he published his first paper, strongly and accurately asserting that pellagra was not communicable (Goldberger 1964b). He insisted that the cause was dietary and that prevention could be achieved by a "reduction in cereals, vegetables, and canned foods that enter to so large an extent into the diet of many of the people in the south and an increase in the fresh animal food component, such as fresh meats, eggs, and milk" (Terris 1964:11,12).

His reasoning was based primarily on observations that he made during a trip to the Millidgeville asylum in Georgia. The disease was epidemic among the patients at the institution yet, curiously, none of the staff had ever been afflicted. Surely, if pellagra were contagious, at least one nurse, doctor or orderly (who often spent up to 14 hours a day with the patients) would have contacted it. Supposedly, the staff and the inmates ate the same food, so diet was ruled out as well.

Upon closer examination, Goldberger discovered that the staff always had first choice in the hospital cafeteria. When meat, fresh vegetables or milk was available, there was seldom any left for the patients. Furthermore, food, in general, was extremely sparse; the total operating budget for the hospital in 1910 (including salaries, medicine, supplies and maintenance) was only 34.5 cents per patient per day (Etheridge 1972:73). Many patients would steal food from those too apathetic or weak to defend themselves. Goldberger designed a meal plan for the pellagrins at the asylum, and within a month or so half had improved significantly and four had recovered completely. He left the implementation of larger-scale diet changes under the care of another public health physician and turned his attention to two orphanages in Jackson, Mississippi, where some 60 to 80 percent of the children had the disease (Roe 1973:101).

For two years, beginning in 1914, the federal government paid $700 per month to supplement the food at the orphanages. The new diet included liberal amounts of fresh milk, meat and eggs. Grits and corn bread consumption were decreased from twice a day to once a week (Etheridge 1972:74). In 1915, the success of the plan was obvious. The annual report of the orphanages described the children as being healthier than ever before. "There can be no doubt that the cause of pellagra is dietary," it stated (Etheridge 1972).

The final proof came with Goldberger's experiment at the Mississippi state prison. He induced pellagra in volunteer convicts (who would receive a governor's pardon for their co-operation in the experiment) by feeding them a diet of white flour, cornmeal, grits, cane sugar, sweet potatoes, pork fat, cabbage and collard greens—the typical diet of many poor Southern families (Goldberger and Wheeler 1964). Six of them developed unmistakable pellagra after about six months. The others were very sick, but lacked the characteristic skin rash. For Goldberger this was enough proof: ". . . the conclusion would seem to us to be warranted that pellagra developed in at least six of our eleven volunteers as the result of the restricted diet on which they subsisted" (Goldberger and Wheeler 1964:79).

This study had been carefully kept out of the press, for fear the families of the convicts would intercede. It had all the makings of sensationalist news, however, and, when the story finally broke, it was given top headlines. Goldberger was exuberant. "This is beyond anything I could have anticipated," he wrote to his wife in 1915. He was convinced that the mysterious etiology of pellagra was solved once and for all and that the disease would soon be eradicated. Unfortunately, this was not to be. The sensationalism surrounding the publication of his "proof" engendered jealousy and hostility among his Southern colleagues. Almost at once they challenged his conclusions for any imaginable reason. (See Etheridge 1972:98.)

Goldberger became convinced that the only way to end the epidemic was to prove beyond doubt the relationship between pellagra and poverty. He deepened his research and analysis of pellagra into an indictment of the whole economic and social system of the South. Poor diet might be the cause of pellagra, he reasoned, but the disease was only a symptom of a greater ill, the utter poverty, degradation and ignorance of the South's rural poor (Goldberger 1964a).

In 1916, Goldberger, quietly went to work to prove quantitatively the relationship between Southern economics, exploitation and pellagra. He and his co-workers (a statistician and an economist among them) chose seven cotton mill villages in South Carolina and painstakingly correlated wages, diet, food prices and disease incidence. After three years of work, their results were published in a series of six papers which strongly condemned

sharecropping, cotton monoculture and the whole economic system of the south (Goldberger 1964a[1920,1921]:113-270).

After the results of the mill villages experiments were published, President Harding became very interested in the plight of the South. He wrote a letter which was published nation-wide calling for food assistance for the South to help combat pellagra. "Famine and plague are words almost foreign to our American vocabulary, save as we have learned their meaning in connection with the afflictions of lands less favored and toward which our people have so many times displayed large and generous charity," he wrote (Etheridge 1972:149). The medical profession had been angry with Goldberger's statements, but the debate had not yet been taken up by the general public. However, President Harding's letter paraded the plight of the South to the whole nation – it was an insult to Southern honour. The South was branded with the stigma of poverty and the implication that it was not capable of surviving without northern help.

Instead of accepting offers of food assistance and approaching the epidemic in a reasonable manner, Southern legislators angrily denied that pellagra incidence was increasing, and insisted that the disease was not nutritional at all (Etheridge 1972:154). The Institute of American Meat Packers offered to donate 20 000 pounds of meat to alleviate the crisis but the South angrily refused (Etheridge 1972:160). Many Southerners claimed that the "epidemic" was merely a fiction created by Northerners to insult them. They branded it as "malicious propaganda" or "utter absurdity" (Etheridge 1972) and spurned charity. To understand the South's seemingly irrational reaction to Goldberger's discoveries in its proper context, it is necessary to delve deeply into its mindset and culture.

The South

> I must have been probably twelve years old before I realized that "damn yankee" was two words.
>
> – My Grandmother, 1989

> All we have here in the South is cotton, slaves . . . and arrogance.
>
> – Rhett Butler

Since the early 1800s, the South has always been apart, both culturally and economically from the rest of the United States. For the most part, this separation was due to slavery – first of all because of the social system it created and, secondly, because of the antagonism it engendered from the rest of the country. The institution of slavery basically created a two-tiered caste system in Southern society with slaves on the bottom and white landowners on

the top. There was no middle class. Slavery mandated that the bulk of the population/labour force (slaves) be kept ignorant and oppressed. This created a vast economic and social polarity in terms of wealth and power—state and local governments, elected officials, newspapers (in most rural places, only the rich whites could read), cash and, most importantly, *information* were all controlled by this élite class. They, although numerically a minority, were the spokespeople of the South and their hegemony was impossible to challenge.

Up until the early 1800s, there were few serious campaigns in the North against slavery; anti-slavery protest was associated primarily with the Quakers or other religious groups (McPherson 1988). However, by the 1850s, slavery had become a serious sectional dispute. As Southern slaveholders came more and more under attack for their "peculiar institution," they developed a stronger and stronger rationale to defend it. Since the main thrust of the anti-slavery crusade was moral, the South accordingly devised its own strident moral rhetoric to counteract the Northern attacks.

These pro-slavery arguments were built around several themes. Some pro-slavery advocates (most notably, John C. Calhoun) insisted that civilization, culture and progress were not possible without a labouring class. Furthermore, it was much more reasonable that this class should be owned rather than hired—that way the owners had a direct, paternalistic and economic interest in the well-being of their labourers. Pro-slavery advocates pointed out the exploitative factory conditions in the North, where workers would be dismissed and abandoned to starve when they were unable to work. South Carolina Senator, James Hammond, succinctly voiced this belief in the utter superiority of Southern civilization in his famous "King Cotton" speech to the Senate in 1858.

> In all social systems there must be a class to do the menial duties, to perform the drudgery of life. . . . Such a class you must have, or you would not have that other class which leads progress, civilization, and refinement. . . . Your whole hireling class of manual labourers and "operatives," as you call them are essentially slaves. The difference between us is, that our slaves are hired for life and well compensated . . . yours are hired by the day, not cared for, and scantily compensated. (Quoted in McPherson 1988:196)

These images of the kindly paternalistic plantation owner and the civilized, refined and morally superior South were strong and resonant. Thus, the self-serving rhetoric sponsored by the planter class became the dominant ideology for the whole South. Poor whites endorsed it as well because of racism—they preferred to identify with the rich whites rather than the slaves. This belief in the inherent moral superiority of the Southern way of life provided a powerful impetus for isolationism, sectionalism and fierce

pride. As the tension between North and South escalated, Southerners became more powerfully unified around these images; it insistently became a distinct cultural entity.

Losing the Civil War did not destroy, but rather strengthened, those beliefs. For the South, the "Glorious Cause" became even more enshrined in defeat. Southerners were unified in their humiliation and defeat and, more importantly, utterly convinced that it was God's will that the South should "rise again" (McPherson 1988). Sharecropping was one attempt to reinstate the old beloved system. Cotton monoculture was also an effort to retrack the path that led the South to its former glory. Growing enough cotton, they reasoned, would surely bring back the pre-war prosperity.

These beliefs carried over until well into the 1900s. In the 1920s, President Harding made a special visit to the South; one old woman refused to see him, insisting that Jefferson Davis was the only President that she would ever acknowledge (Chapman 1922). Southerners saw themselves as the valiant remnants of a dignified and superior society. "The South has always been the land of refinement and chivalry, of leisurely courtesy and boundless hospitality, the land of fair women and brave men . . . the greatest gift we can bring the nation is our true character" (Chapman 1922).

Integral to the Southern identity was fierce devotion and pride. The formula was simple: to criticize the Southern code was blasphemy, to endorse it was patriotism. This is especially evident in the South's reaction to Goldberger's discoveries. Southerners could not accept Goldberger's conclusions about pellagra because to do so would shatter their cherished belief in the purity of their social system. It would be defaced with the stigmas of poverty, hunger and social ill. The Civil War had forced the South to admit *defeat*, but epidemic nutritional disease meant *failure*—failure of cotton, failure of the Southern ideal and a surrender of Southern honour. This was the true reason for the South's inertia in addressing the pellagra epidemic. Had the disease been caused by a mosquito or a fungus, the response would have been different. As it turned out, it was not until a natural disaster decimated the croplands in the Mississippi River Valley that the South finally could accept food aid and initiate an anti-pellagra campaign without losing face.

Finale

In the early spring of 1927, the Mississippi River overflowed its banks and devastated prime farmland throughout 12 states in 112 counties (Etheridge 1972). Goldberger predicted a massive increase in the number of pellagra cases unless some preventive measures were taken as part of the flood relief in general. The flood meant that the Southerners could accept aid without

feeling stigmatized—they listened to Goldberger and could accept offers from the Red Cross. In the preceding years, he had quietly and painstakingly been conducting a search for foods high in the mysterious substance known as P-P (pellagra preventive factor). Brewer's yeast proved to have the most dramatic effects so the Red Cross began distributing yeast along with surplus garden seeds to flood victims.

The obvious success of this response to the flood crisis won over many of the Southern physicians. In 1928, they announced an official endorsement of Goldberger's ideas and denounced the economic conditions of the South. The public health effort still lagged far behind, however; mortality statistics continued to climb at an alarming rate and the South sunk deeper into an agricultural depression. Between 1924 and 1928 mortality from pellagra jumped 58 percent (Roe 1972:128). The agricultural depression and the economic conditions in the South continued to worsen—foreshadowing the industrial crash to come.

Ironically, it was the Great Depression that provided the most relief to the farmers in the South. A tremendous drought hit the South in 1930-31 at the same time that banks were failing all across the region. Relief efforts by the Red Cross were intensified. Since the cotton crop had failed miserably, and cotton was practically unsaleable anyway, agricultural extension agents encouraged farmers to turn their attention to food crops. Home canning was successfully promoted in conjunction with gardening. Pellagra incidence declined significantly, but it was not until the 1940s with the discovery of niacin and the subsequent enrichment of cereal products that it was finally eradicated once and for all.

In 1937, niacin was finally isolated as the elusive pellagra preventive factor by Drs. Tom D. Spies, William Bennett Bean and Robert F. Stone (Roe 1973:126). At that point, the number of pellagra cases per year was estimated to be around 400 000 with a mortality rate of about 30 to 40 percent (Roe 1973:126). By 1940, this had plunged to 9000 cases with 2040 deaths (or 23% mortality rate), and by 1945 this was further decreased to 4000 cases with 865 deaths (Etheridge 1972:208). The end of pellagra in the United States, however, came with the decision to enrich bread and other cereal products during the World War II years.

In terms of eliminating a particular nutritional disease, the eradication of pellagra is a success story. In less than 20 years, U.S. scientists had solved a medical mystery that had puzzled Europeans for decades. However, too much self-congratulation is not in order. Medical researchers had brought relief for some of the outward symptoms, but the true underlying illness was social, not medical. The eradication of pellagra did very little to modify the socio-economic conditions in the South to a more equitable system. The poor were still exploited (albeit on a somewhat smaller scale), but, once

they no longer suffered gross visual manifestations of their plight, little attention was paid to their misery.

Notes

1. This paper was the winning entry of the 1991 Northeastern Anthropological Association Student Essay Competition, graduate category.
2. I have based these estimates on various statistics. One South Carolina public health official estimated 400 000 cases of pellagra in the worst year of the epidemic with a mortality rate anywhere from 30 to 60 percent. I would estimate the average disease incidence per year between 1916 and 1930 at somewhere between 60 000 and 100 000 cases with a mortality rate of 45 percent.

References Cited

Bousfield, M.O.
1934 Reaching the Negro Community. American Journal of Public Health 24:209-215.

Caldwell, Erskine, and Margaret Bourke-White
1937 You Have Seen Their Faces. New York: Modern Age Books.

Carter, Marion Hamilton
1909 Pellagra, the Medical Mystery of Today. McClures Magazine 34:94-107.

Chapman, Maristan
1922 The South's Spiritual Grace. The South Atlantic Quarterly 21:289-297.

Etheridge, Elizabeth
1972 The Butterfly Caste: A Social History of Pellagra. Westport: Greenwood Press.

Goldberger, Joseph
1964a Goldberger on Pellagra. Edited by Milton Terris. Baton Rouge: Louisiana State University Press.
1964b The Cause and Prevention of Pellagra [1914]. *In* Goldberger on Pellagra, edited by M. Terris, pp. 23-26. Baton Rouge: Louisiana State University Press.

Goldberger, Joseph, and G. A. Wheeler
1964 The Experimental Production of Pellagra in Human Subjects by Means of Diet [1920]. *In* Goldberger on Pellagra, edited by M. Terris, pp. 54-94. Baton Rouge: Louisiana State University Press.

Goldberger, Joseph, G. A. Wheeler and Edgar Sydenstricker
1964 A study of the Relation of Family Income and Other Economic Factors to Pellagra Incidence in Seven Cotton Mill Villages of South Carolina in 1916 [1920]. *In* Goldberger on Pellagra, edited by M. Terris, pp. 225-267. Baton Rouge: Louisiana State University Press.

Keasby, Lindley
1915 Agrarian Unrest in the South. New Republic 4:4-6.

King, Willford
1921 Pellagra and Poverty. Survey 46:629-632.

Kirschman, John D.
1973 Nutrition Almanac. New York: McGraw-Hill.
McCollum, Elmer
1957 A History of Nutrition. Cambridge: Riverside Press.
McPherson, James
1988 Battle Cry of Freedom: The Civil War Era. New York: Oxford University Press.
Roe, Daphne
1973 A Plague of Corn: The Social History of Pellagra. Ithaca: Cornell University Press.
Snyder, Howard
1924 The South, Negro Migration and the Cotton Crop. North American Review 219:486-495.
Stampp, Kenneth
1965 The Era of Reconstruction. New York: Vintage Books.
Terris, Milton
1964 Introduction. *In* Goldberger on Pellagra, edited by M. Terris, pp. 3-16. Baton Rouge: Louisiana State University Press.
Wilson, Anna May
1952 The Conquest of Pellagra. Today's Health 30:40-42.
Wood, Edward Jenner
1909 The Appearance of Pellagra in the United States. Journal of the American Medical Association, July 24, 1909.