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The Etiology of Pellagra (1914) [with Commentary]

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The Etiology of Pellagra (1914)

(Joseph Goldberger)

COMMENTARY

Alan M. Kraut, PhD

In the early spring of 1914, U.S. Public Health Service Officer Dr. Joseph Goldberger was spending day and night in the Hygienic Laboratory's library. Sleeping some nights on a cot next to a table piled high with state public health reports and the published papers of American and European medical investigators, Goldberger, at the behest of Surgeon General Rupert Blue, was leading the federal government's investigation of pellagra. Tens of thousands of Americans were contracting the dreaded disease, and in some Southern states, the mortality rate was 40%. Pellagra was called the disease of the four d's: diarrhea, dermatitis, dementia, and death. Well known in southern Europe, pellagra was increasingly prevalent in the United States, especially in the South Atlantic region, causing politicians to demand action. If there was a pellagra germ, it must be identified and therapies concocted.

On the reports and papers he read, now in the collection of the National Library of Medicine, Goldberger penciled a trail of underlinings and marginalia that open a window on his thoughts on pellagra. Some European researchers hypothesized a pellagra germ. Others attributed pellagra to the consumption of decomposing corn.

Goldberger, a Hungarian immigrant who received his medical degree from Bellevue Hospital Medical College in 1895, was well versed in the problems of infectious disease. After a brief time in private practice, he joined the U.S. Marine Hospital Service in 1899 and battled infectious diseases in the field and in the laboratory, including yellow fever, typhoid, typhus, dengue fever, measles, and diphtheria. It was this experience that led Goldberger to doubt there was a pellagra "germ" and to look instead at diet.

Goldberger had noticed that in institutions with large numbers of pellagrins—orphanages, sanatoriums, and prisons—staff members did not appear to contract the disease. He asked, "If pellagra be a communicable disease, why should there be this exemption of the nurses and attendants?" Goldberger observed that of the available food, staff could select "the best and greatest variety for themselves" and supplement their diet, as inmates could not. He also cited research demonstrating that the urban poor had a more varied diet than the rural poor, the most frequent victims of pellagra.

In "The Etiology of Pellagra," Goldberger suggested that "pending the final solution," pellagra might be prevented with a "reduction in cereals, vegetables and canned foods" and an increase in the "fresh animal food component such as fresh meats, eggs, and milk." He spent the rest of his life demonstrating that pellagra was caused by malnutrition. And his blunt assessment that pellagra was a disease of poverty put him on a collision course with Southern politicians and business leaders anxious to promote the idea of a prosperous New South to investors.

Ultimately, Goldberger would be vindicated. In the decade following his 1929 death, researchers would learn that niacin, a B vitamin, was the missing element from pellagrins' diets. The selection here marks the beginning of Goldberger's war against pellagra and public opinion.

Alan M. Kraut is Professor of History at American University, where he teaches courses in immigration history and the history of American medicine and public health. He is the author or editor of six books, including Goldberger's War, the Life and Work of a Public Health Crusader (2003), which received the Arthur Viseltear Prize from the American Public Health Association and the Henry Adams Prize from the Society for History in the Federal Government.



Joseph Goldberger

THE ETIOLOGY OF PELLAGRA

The Significance Of Certain Epidemiological Observations With Respect Thereto

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By Joseph Goldberger, Surgeon, United States Public Health Service, in charge of Pellagra investigation.

The writer desires to invite attention to certain observations recorded in the literature of pellagra the significance of which appears entirely to have escaped attention.

At the National Conference on Pellagra held in Columbia, S.C., November 3, 1909, Siler and Nichols in their paper on the "Aspects of the pellagra problem in Illinois" stated that certain facts "would seem to indicate that the exciting cause of the disease is present within the institution" (Peoria State Hospital), and add that "at the same time no nurses, attendants, or employees have shown the disease."

Manning, medical superintendent of the asylum at Bridgetown, Barbados, on the same occasion, in arguing against the identity of a disease that he called psilosis pigmentosa, with pellagra, but which undoubtedly is this disease, states that he had never seen it develop in an attendant.

At the same conference Mobley, from the Georgia State Sanitarium, in the course of his discussion of the relation of pellagra to insanity, presents data showing that at the Georgia State Sanitarium a considerable proportion of the cases of pellagra develop in inmates who have been residents therein for considerable periods, mentioning one case in an inmate after 10 years residence. In this connection he remarks, what must have struck him, as it no doubt must have appealed to Siler and Nichols at the Illinois institution, as a curious fact, that "so far as can be ascertained there has never been a case of pellagra to develop among the nurses, white or colored, while employed as such in the Georgia State Sanitarium."

Sambon (1910) in his "Progress report" states that in Italy "no precautions are ever taken to avoid propagation of the malady in any of the pellagrosari, locande sanitarie, hospitals, insane asylums, and other institutions in which very numerous pellagrins are collected every year. Long experience has taught that there is no danger whatever of transmission from the sick to the healthy in any collective dwelling within urban precincts."

Sambon's statement is confirmed by Lavinder, who in a personal communication states that on careful inquiry while visiting a large pellagrosario near Venice, one in which some 300 to 500 pellagrins are constantly present and cared for by a large number of Sisters of Charity and other employees, he was assured that no employee had ever developed the disease while at the institution.

The results of personal inquiry at some of our State asylums in which pellagra occurs confirm the reported observations above cited. Thus at the South Carolina State Hospital for the Insane, where Babcock (1910 Ann. Rept.) states that cases of Pellagra develop in patients who have been there for years, no case so far as the writer was able to ascertain has occurred in the nurses or attendants. It may be of interest to recall in this connection that in his annual report for 1913 Babcock states that a total of about 900 pellagrins had been admitted to his institution during the preceding six years. At the State hospital for the insane at Jackson, Miss., there have been recorded 98 deaths from pellagra for the period between October 1, 1909, and July 1, 1913. At this institution cases of institutional origin have occurred in inmates. Dr. J. C. Herrington, assistant physician and pathologist, told me at the time of my visit of a case in an inmate after 15 and in another after 20 years' residence at the institution. No case, so far as I was able to learn, has developed in a nurse or attendant, although since January 1, 1909, there have been employed a total of 126 who have served for periods of from 1 to 5 years.

In considering the significance of the foregoing observations it is to be recalled that at all of these institutions the ward personnel, nurses, and attendants spend a considerable proportion of the 24 hours, on day or night duty, in close association with the inmates; indeed at many of these institutions, for lack of a separate building or special residence for the nurses, these live right in the ward with and of necessity under exactly the same conditions as the inmates.

It is striking therefore that although many inmates develop pellagra after varying periods of institutional residence, some even after 10 to 20 years of institutional life, and therefore it seems permissible to infer, as the result of the operation within the institution of the exciting cause or causes, yet nurses and attendants living under identical conditions appear uniformly to be immune. If pellagra be a communicable disease, why should there be this exemption of the nurses and attendants?

To the writer this peculiar exemption or immunity is inexplicable on the assumption that pellagra is communicable. Neither "contact" in any sense nor insect transmission is capable of explaining such a phenomenon, except on the assumption of an incubation or latent period extending over 10 to 20 years. In support of such assumption there exists, so far as the writer is aware, no satisfactory evidence.

The explanation of the peculiar exemption under discussion will be found in the opinion of the writer in a difference in the diet of the two groups of residents. At some of the institutions there is a manifest difference in this regard; in others none is apparent.

The latter would seem to be a fatal objection to this explanation, but a moment's consideration will show that such is not necessarily the case. The writer from personal observation has found that although the nurses and attendants may apparently receive the same food, there is nevertheless a difference in that the nurses have the privilege—which they exercise—of selecting the best and the greatest variety for themselves. Moreover, it must not be overlooked that nurses and attendants have opportunities for supplementing their institutional dietary that the inmates as a rule have not.

In this connection brief reference must be made to two other epidemiological features of pellagra. It is universally agreed (1) that this disease is essentially rural, and (2) associated with poverty. Now there is plenty of poverty and all its concomitants in all cities, and the question naturally arises why its greater predilection for rural poverty? What important difference is there between the elements of poverty in our slums and those of poverty in rural dwellers? It is not the writer's intention to enter at this time into a detailed discussion of these questions; he wishes to point out one difference only. This difference relates to the dietary. Studies of urban and rural dietaries (Wait - Office of Experiment Stations, Bull 221, 1909) have shown that on the whole the very poor of cities have a more varied diet, than the poor in rural sections. "Except in extreme cases, the city poor *** appear to be better nourished than the mountaineers" of Tennessee.

With regard to the question of just what in the dietary is responsible, the writer has no opinion to express. From a study of certain institutional dietaries, however, he has gained the impression that vegetables and cereals form a much greater proportion in them than they do in the dietaries of well-to-do people; that is, people who are not, as a class, subject to pellagra.

The writer is satisfied that the consumption of corn or corn products is not essential to the production of pellagra, but this does not mean that corn, the best of corn, or corn products, however nutritious and however high in caloric value the may be, are not objectionable when forming of themselves or in combination with other cereals and with vegetables, a large part of the diet of the individual.

In view of the great uncertainty that exists as to the true cause of pellagra, it may not be amiss to suggest that pending the final solution of this problem it may be well to attempt to prevent the disease by improving the dietary of those among whom it seems most prevalent. In this direction I would urge the reduction in cereals, vegetables, and canned foods that enter to so large an extent into the dietary of many of the people in the South and an increase in the fresh animal food component, such as fresh meats, eggs, and milk.

It may be of interest to add that intensive studies along the lines so strongly suggested by the observations above considered are being prosecuted by several groups of workers of the United States Public Health Service.



Pellagra: Half-length view of a young boy with severe dermatitis on his face and hands.

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U.S. National Library of Medicine, History of Medicine Division