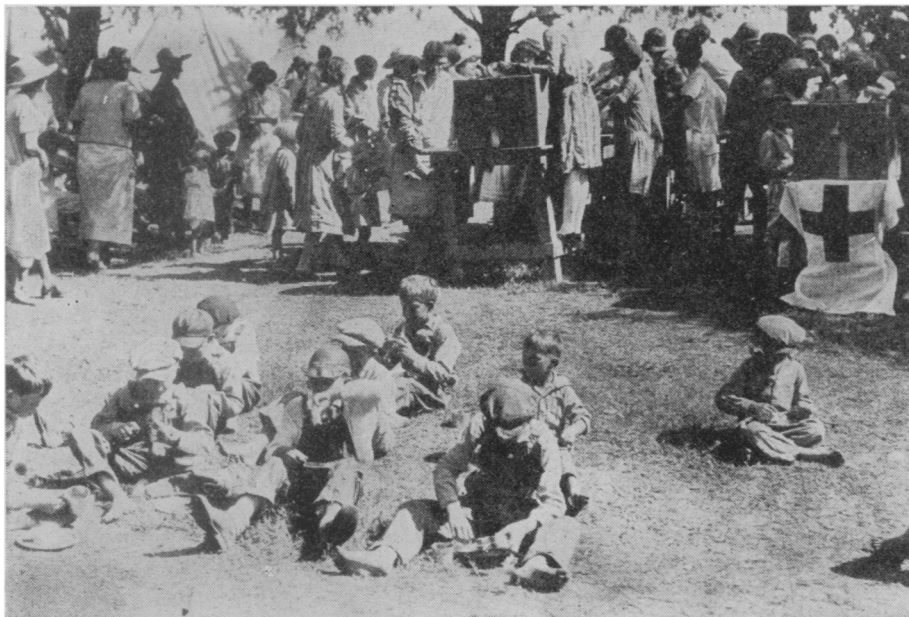


# Dogs and Convicts Aid Pellagra Sufferers

Medicine



*MISSISSIPPI FLOOD SUFFERERS* were given thousands of pounds of yeast by the Red Cross, and so what might have been a serious pellagra epidemic was prevented

By MARJORIE MACDILL

Another vitamin has come to light that already, in the short time that it has been known to science, has been the means of bringing life and hope to thousands of stricken sufferers.

Workers in the fields of nutrition and physiology recognize five vitamins as necessary for health and growth of the human body. From one of these, the anti-neuritic vitamin B, there has been split off a factor, P-P. that has the distinct property of preventing pellagra, a disease that successfully baffled physicians of the Old and New World for two hundred years.

Known for generations among the poverty-stricken peasants of southern Europe, pellagra was recognized about twenty years ago as being undeniably and uncomfortably frequent among the poor whites and negroes of our own South. Federal investigation was ordered and a corps of experts from the U. S. Public Health Service was put to work on the problem. Chief of these was Dr. C. H. Lavinder, later succeeded by Dr. Joseph Goldberger of the U. S. Hygienic Laboratory, who now, after fourteen years of research, has shown that the disease that almost everyone thought was infectious, is not due to a germ at all but comes from a faulty and unbalanced diet.

Pellagra is a painful malady of disturbed digestion, accompanied by distressing skin eruptions, that sometimes terminates in insanity and death. The fact that it recurs frequently in the same individual has been interpreted by many physicians to mean that it is a long drawn out disease lasting for years, with periods of quiescence and activity. The modern view, however, considers that the recurrences are simply due to a repetition of the circumstances that bring about the disease. In other words, the continued use of the same unbalanced diet brings about repeated attacks of pellagra.

Because of inadequate reporting it is hard to obtain exact figures of its incidence, though thousands of cases are known to occur, particularly in the South in years of financial depression. It is characteristically a disease of poverty that has followed the bad cotton years like a gaunt specter. It shows, moreover, a marked seasonal variation, dying down in the fall and winter, only to flare up with hundreds of new cases in the spring and summer during the busy season, when all hands should be in the fields.

The three M's—meat, meal and molasses, main bill of fare of the one-crop tenant farmer while waiting for his cotton crop to mature, is the most fruitful immediate cause of pellagra, in Dr. Goldberger's es-

timation. This does not mean that these staples are not safe, substantial articles of food, but it does mean that they do not contain certain vital principles necessary to prevent the onset of pellagra.

The coarse, monotonous menu was suspected from the very first by the workers trying to unravel the mystery of pellagra's origin. Attempts were made to induce the disease by such a diet in the laboratory in rats and chickens, but were not a success. At the same time, attempts to pass the disease from humans to animals by inoculation, which would have been conclusive proof that it was infectious, were not successful either. A diseased condition in rats similar to pellagra, however, was found to be considerably improved by certain diets.

The next step was to try experimental diets in insane asylums and prisons in the South, where the pellagra incidence among the inmates was very high. Many valuable observations of this sort were made at Milledgeville Sanitarium in Georgia but what was, perhaps, the most interesting experiment took place at the Rankin Prison Farm of the Mississippi State Penitentiary.

On the offer of a pardon, twelve convicts were found willing to undertake a diet that the doctors thought might induce pellagra experimentally. The bill of fare consisted mainly of unappetizing cereals, with few variations that would appeal to epicures. The members of the Pellagra Squad, as it came to be called, were kept under guard and segregated, so that no food other than the prescribed diet could be obtained. The controls, mostly officials, were given the same menu, but with certain additions of milk, butter, lean meat and eggs. Of the eleven volunteers who remained in the test to the end (one escaped before the experiment was finished), six developed pellagra, while all of the controls remained in good health.

Evidence continued to pile up that pellagra was due to some lack in the diet, but just specifically what element in food prevented its occurrence still eluded the investigators. Finally a clue came from some work with dogs.

Dogs are subject to a disease that veterinarians call black tongue that shows many points of resemblance to pellagra in (*Turn to next page*)

## Aiding Pellagra Sufferers—Continued



DR. JOSEPH GOLDBERGER of the U. S. Hygienic Laboratory, who, for 14 years, headed the pellagra research. Finally his work culminated with the discovery of vitamin factor P. P.

human beings. One of the men at the Hygienic Laboratory tried to produce black tongue with an experimental diet, but since laboratory food lists do not always exercise an appeal to doggyish gustatory sensibilities, a small amount of yeast was included as an appetizer. Yeast, any nutrition expert will explain, is a rich source of vitamin B, a potent factor in inducing appetite.

This particular group of dogs failed to develop black tongue, but a record of the work and its results was carefully filed away. A different line of research was taken up and the work on black tongue was side-tracked for a time. Eventually, however, it was taken up again, and the records were pulled out to see what diets had been used in the past. It was noticed that the diet in which yeast was used did not produce the desired disease. Accordingly, regardless of appetite, another group of dogs was fed on a diet that did not include yeast. In due course of time these dogs developed black tongue and it dawned on the investigators that here was a lead. Yeast might be the preventive. Yeast, as was well known, contained the anti-neuritic vitamin B, likewise responsible for appetite and a preventive of beri-beri, a deficiency disease somewhat like scurvy.

"Was this versatile vitamin also a pellagra preventive?" the scientists

asked themselves. Further experiments showed that this was not quite true. The pellagra preventive factor, P-P. can be completely separated from vitamin B and has been used in a relatively pure and concentrated form in the laboratory, but yeast continues to be the convenient form in which it is administered to pellagra patients.

Lean meat, fresh vegetables and milk also contain the newly recognized life-giving factor and should be included in the daily menu of every pellagrin.

"Why bother," explained Dr. Goldberger, "to give out concentrated medicine to prevent pellagra when a little yeast, or, better still, a half of a pound of beefsteak will do the trick and is much more interesting?"

"A half an ounce of dried pure yeast a day," he added, "will prevent the appearance of pellagra, even though the daily diet lacks all other foods that will help prevent the disease."

Acting on this advice from the U. S. Public Health Service, the Red Cross distributed some 11,500 pounds of yeast to refugees in the stricken states inundated by the Mississippi flood. It was inevitable in the distressed times that followed the flood that many cases of pellagra should develop from lack of a properly balanced diet, but the colossal mountain of Red Cross yeast undoubtedly did its bit in holding a serious outbreak in check. Many southern hospitals and asylums now include yeast in the patients' diet and the number will probably be increased as time goes on.

Dr. Goldberger and Edgar Sydenstricker, chief statistician of the U. S. Public Health Service, made an extensive survey of the pellagra situation in the flood states immediately after the water subsided. On

their return they reported that, in their estimation, diversification of crops and the improvement in the supply of milk through more farmers owning cows would do more to eradicate the disease in the South than any other measure.

From the survey made by Dr. Goldberger and Mr. Sydenstricker, it is estimated that the number of pellagra cases in 1927 was around 50,000, with deaths ranging from 2,300 to 2,500. This forecast, made by the experts in the field, led the U. S. Health Service to broadcast information on the prevention and treatment of the disease. Unfortunately, the early symptoms of the disease are indefinite. Nevertheless, in the regions below the Potomac and the Ohio, where the disease is most prevalent, suspicion should be aroused by lack of strength, headache, indigestion, nervousness and pain. If these rather general manifestations are followed up with burning of the hands and feet, a reddened tongue and diarrhoea, the evidence of pellagra is more definite. In more advanced cases, skin eruptions appear, followed by a parchment-like aspect of the skin, which may become rough and scaly, eventually cracking and peeling off. The backs of the forearms, hands and feet are the most common sites of peeling skin. Inquiry usually elicits the information that the victim has been living on salt pork, cornmeal and molasses, a diet that does not contain enough of the pellagra preventive vitamin to forestall the onset of the disease.

Suitable quantities of milk, vegetables, fruits, lean beef, mutton, fish, fowl, yolks of eggs and powdered yeast consumed regularly are the best preventive as well as cure. The yeast plant, the most potent source of the vitamin yet (Turn to page 299)

<p>VITAMIN "A"</p> <p>PREVENTS EYE DISEASES</p>	<p>VITAMIN "B" IN VEGETABLES</p> <p>PREVENTS BERI-BERI</p>	<p>VITAMIN FACTOR "P.P." IN</p> <p>PREVENTS PELLAGRA</p>	<p>VITAMIN "C." IN CITRUS FRUITS</p> <p>PREVENTS SCURVY</p>	<p>VITAMIN "D" IN</p> <p>PREVENTS RICKETS</p>	<p>VITAMIN "E" IN WHEAT KERNELS</p> <p>PREVENTS STERILITY</p>	<p>VITAMIN "F" IN</p> <p>PREVENTS STUNTED GROWTH</p>
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THIS CHART shows the place of the Pellagra Preventing vitamin in the vitamin family, as so far known

# Sun a Pulsating Star

*Astronomy*

BY GABRIELLA ARMELLINI

Signorina Armellini is director of the Royal Observatory of Rome, and here announces for the first time in English her important discovery.

From time to time, spots are visible on the sun and they are sometimes so large as to be seen by the naked eye, with the help, of course, of smoked glass. When examined through powerful telescopes, these spots appear as holes or fissures in the luminous surface.

Statistics have shown that the sun's surface appears to have the largest number of spots once in every eleven years, after which period a gradual decrease in the number, frequency and size of the spots is noted. At present, the spots are almost at their maximum.

It has now been ascertained, at the Astronomical Observatory of Rome, situated on the Capitol, that the diameter of the sun varies in proportion with the number and frequency of the spots.

The work of ascertaining this fact has been long and difficult, because the variations are slight and take

place over long periods. Thus, before the theory could be formulated, several periods of eleven years had to elapse, handing on the result of their investigations as a legacy to those who were to come after them. Every day, at midday, for the last fifty years and more, on clear days, the sun's diameter is measured in the Roman Observatory by throwing the image of the sun on to a white screen, through an astronomical telescope which reproduces the image with a diameter of about one meter.

Measurements are carried out by means of a network of thin cobwebs, and in order to insure perfect accuracy are taken separately by three different astronomers, each of whom repeats the operation seven times.

The results of these observations, which have been carefully collected and investigated, have enabled the fact to be established that the diameter of the sun also varies in every period of eleven years, but that the sun is at its greatest diameter a little before the greatest (*Turn to next page*)

## Pellagra—Continued

known to science, should preferably be given dead. It can be killed by stirring the dry yeast into water and boiling the mixture for about a minute. The adult dosage is one ounce a day, or two teaspoonfuls taken three times a day. A child under twelve years of age should be given half the adult dose. The diet should be increased as rapidly as the digestive ability of the patient permits. In the average case the patient, if carefully fed, will be fully convalescent in from six to twelve weeks.

The well balanced diet should be kept up all the year round, for one attack of pellagra does not confer immunity. If the diet again becomes deficient, the disease will come back again. One drawback in the poorer sections of the South in the past has been the lack of refrigeration to keep fresh meat during the summer months. This is one reason that accounts for the seasonal recurrence of the disease in the spring and summer months. At this time, too, the "crop money" received for the proceeds of the cotton harvest the preceding fall begins to run short. Consequently, there is less wherewithal for any small supplements to the staple menu of cornmeal and pork. When prices are high, of course, the condition is

more aggravated still.

"Under proper treatment and with careful nursing, only a small percentage of cases die," Dr. Goldberger has pointed out. "Nevertheless, the actual number of deaths is deplorably large. As deplorable, if not even more so, is the great amount of sickness and debility, much of it vague and ill-defined, and thus frequently unrecognized, which pellagra must be charged with causing. It is probable that in each year for every death attributed to the disease there are fully 20 persons with clearly recognizable attacks and probably as many more with debility from the same cause, but not definitely marked as such. Indeed, in many of the southern states pellagra is still one of the foremost causes of death. In other parts of the country the disease is very much less common. This difference is due mainly to the different dietary habits of the people in the northern and western part of the country and to the better conditions of food supply."

It is felt by many physicians to be especially fortunate that the cause and prevention of this disease should have been so well worked out at a time of disaster, like the Mississippi flood, when the knowledge was so badly needed.

*Science News-Letter, May 12, 1928*

## NATURE RAMBLINGS

BY FRANK THONE

*Natural History*



**Kinkajou**

We are often called upon to admire the wonderful help that nature gave to our poor cousin, the monkey, in providing him with a fifth hand in the form of a prehensile tail. Monkeys are not the only prehensile-tailed creatures in the world, but it cannot be denied that they fared better than most other creatures so provided, because they also got long arms and legs out of the evolutionary grab-bag, so that all five of their hands are on a more or less equal footing.

Less lucky is the kinkajou, a tree-dwelling relative of the raccoons, that lives in the American tropics, ranging from central Mexico southward to the Rio Negro in Brazil. The kinkajou has a long and a very handsome tail, with which it can take hold of a branch as readily and as firmly as any monkey. But it is about three sizes too long, when the kinkajou's short, raccoon-like legs are taken into account. Consequently, when the animal has grown tired of swinging from its branch, there is nothing for it to do but take hold of its own tail as though it were a rope or a vine, and climb back up, hand over hand.

A captured kinkajou makes a very attractive pet. With its short, close fur and its intelligent-looking face it looks like a sort of long-tailed live Teddy bear, and it is very fond of being scratched and stroked. It has the decided drawback, however, of being entirely too fond of young birds, and can no more be trusted near a poultry yard during chick-time than a cat. Of course, all this is of little value as a practical consideration in temperate countries, for tame kinkajous have so far been kept only in the tropics. But the time may come when we shall be willing to vary our collection of pets, and in that day the kinkajou may well come into its own.

*Science News-Letter, May 12, 1928*