The prevalence and psychology of pellagra / by J.W. Babcock.

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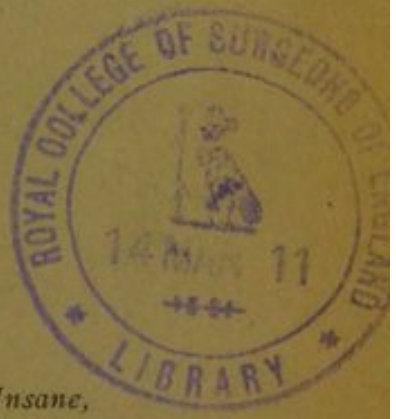

By J. W. BABCOCK,
Physician and Superintendent, State Hospital for the Insane, Columbia, S. C.

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THE PREVALENCE AND PSYCHOLOGY OF PELLAGRA.*

By J. W. BABCOCK,

Physician and Superintendent, State Hospital for the Insane, Columbia, S. C.

At the last meeting of this Association, a collaborated report[1] was presented upon the known and estimated statistics of pellagra in this country. At the request of your committee on program, I renew and amplify the topic to-day. Unfortunately, I must still speak from the asylum point of view, reliable statistics from the general population not yet being available from many States.

I. Prevalence.

In the previous paper, it was stated that 1000 cases of pellagra had been reported from thirteen States, more than half being in insane asylums and similar institutions. These cases were, for the most part, in the South Atlantic and Gulf States, and a conservative estimate was given of the occurrence of 1500 cases in the Southern States in the three preceding years. When our manuscript went to press in the early fall, the number of States in which pellagra had been reported, had reached sixteen, two interesting foci of the disease having been discovered in Illinois in July and August at the Cook County and Bartonville hospitals, respectively.

In December, 1909, records were at hand of the existence of pellagra in 26 States. A few cases of the disease had been diagnosed or suspected in: Massachusetts, New York, New Jersey, Pennsylvania, Maryland, Oklahoma, Arkansas, Kentucky, Iowa, Kansas, California, Ohio, New Mexico and Colorado. Some of these were "imported."

While in the following States, pellagra had been recognized as present in more formidable proportions among natives and residents, more especially in insane asylums; Virginia, North Caro-

*Read at the sixty-sixth annual meeting of the American Medico-Psychological Association, Washington, D. C., May 3-6, 1910.

line, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Tennessee and Illinois.

To these we may now add Vermont and Missouri.

Since this paper was read single cases of pellagra have been reported from Rhode Island, West Virginia and the District of Columbia; and record may be entered of the discovery of another interesting focus of the disease recently made at the Philadelphia Hospital for the Insane ("Blockley").

PELLAGRA IN THE UNITED STATES.

States.	Cases.
1. Massachusetts	3
2. New York	3
3. New Jersey (imported)	1
4. Pennsylvania	33+
5. Maryland	7
6. Virginia	100-300
7. North Carolina	200
8. South Carolina	500
9. Georgia	670
10. Florida	50+
11. Alabama	330
12. Mississippi	188
13. Louisiana	500(?)
14. Texas	100
15. Oklahoma	1
16. Arkansas	1
17. Tennessee	51
18. Kentucky	5
19. Illinois	250
20. Iowa	2
21. Kansas	2
22. California	7
23. Indiana	1(?)
24. Ohio	1
25. New Mexico	2
26. Colorado	1(?)
27. Missouri	3
28. Vermont	1
29. Rhode Island	1
30. West Virginia	1
31. District of Columbia	1

This table indicates that pellagra exists, or is suspected, in 30 States and the District of Columbia, and that the number of cases approximates 3000. Some of the figures are based upon actual

cases, and others upon general estimates. While some estimates seem large, nearly all are made by health officers, or physicians, who have had experience with both statistics and pellagra, so that upon the whole the sum total may, as was claimed for the estimates last year, be considered as conservative. That 5000 cases of pellagra have occurred in the United States in the last five years is probably true.

North Carolina.—"There is satisfactory proof that at least one case of pellagra occurred in this State as far back as 1889. There are definite records of 200 cases in North Carolina. It is difficult to estimate how many cases occurred in the State as a whole. It is certain that only a small portion have been recognized. It is no unusual thing for us to find, in running down one case, four or five more very mild cases in the same house."[2]

Alabama (Dr. J. T. Searcy).—Pellagra statistics in asylums up to December, 1909. The Bryce Hospital since 1896: White men, 6; white women, 21; total, 27; deaths, 18. Mt. Vernon (colored) Hospital since 1896: Negro men, 66; negro women, 144; total, 210; deaths, 121. Average number of white patients, 1350. Average number of colored patients, 650.

A press report based upon records of the Alabama State Board of Health states: "Fifty-five persons (21 white, 34 negroes) died of pellagra from January 1, 1909, to October 1, 1909, and 38 cases were still under observation."

South Carolina.—"The disease has been recognized in Charleston, since March, 1908, but it is a very general opinion among the local physicians there, that pellagra has existed in that city for 20 years or more under other diagnoses. Nineteen cases (white males 6, colored males 3, colored females 10) have been recognized. Ten have died. The death rate in insane cases was especially high."[3]

I will pass among you two maps: showing the local origin of 137 cases of pellagra admitted to the South Carolina State Hospital from January 1, 1908, to November 1, 1909 (about 12 per cent of the total admissions). In the State Hospital last year out of 605 admissions, 92 or 15 per cent had pellagra on admission, and there were 68 deaths from the disease. The other map is based upon reports to the secretary of the State Board of Health from physicians upon pellagra throughout the State.

The most striking feature about these two maps is the greater prevalence of the disease, just as had been suspected, above the "fall line," or in the upper part of the State.

LOUISIANA.—"The number of cases of pellagra in the State positively diagnosed is about 75, of which 85 per cent are in State institutions."[4]

VERMONT.—A press dispatch under date of April 17, 1910, reports what is said to be the first case of pellagra in Vermont, in a woman, at the Fanny Allen Hospital at Burlington.

PENNSYLVANIA.—Passed Assistant Surgeon John D. Long, U. S. P. H., and M.-H. Service, tells me that about June 1, 1910, in consultation with the medical officers of the Philadelphia Hospital for the Insane ("Blockley"), he saw in that institution nine cases of pellagra, and 16 suspects.

RHODE ISLAND.—A despatch dated July 12 announces the death at the State Alms House at Providence of the first case of pellagra in the State, a man 55 years old.

CUBA.—"It has been taken for granted that pellagra does not exist in Cuba, but Dr. Manuel Bango says very rarely cases have been imported from the Asturias, and occasionally a tentative diagnosis has been made in natives or residents, usually alcoholists or sufferers with sprue."[5] Such are some of the current reports about the prevalence of pellagra. They could easily be multiplied.

The general attitude of the American medical mind towards the possible existence of pellagra in this country is well illustrated by the fact that one of our highest authorities on diagnosis a few years ago, while on a visit in South Carolina, after carefully studying a typical pellagrin, rendered the opinion to his equally puzzled fellow-consultant that it was a case of "Glossitis." This incident may soothe our professional conscience somewhat, but it does not excuse us. I know that I should have made the diagnosis of pellagra in South Carolina nearly 19 years ago. If pellagra and beriberi have admittedly occurred in our asylums, sporadically or endemically, shall we not learn a lesson therefrom and hereafter be on the alert for other so-called tropical diseases?

Neither the occasion nor space permit consideration of foreign statistics, however interesting and instructive they may be. But briefly, it may be noted that, according to the circular recently issued by the British Pellagra Investigation Committee: "In cer-

tain countries within the Mediterranean regions, such as Spain, Italy and Roumania, pellagra is looked upon as a veritable calamity. For Italy, a yearly estimate of from 50,000 to 60,000 standing cases is no exaggeration; whilst Roumania, with a population of 5,300,000 is estimated to have from 40,000 to 50,000 cases." When we recall that according to different authorities from 4 to 10 per cent of pellagrins become insane, we can understand the significance of these figures to alienists, as well as to sanitarians and publicists.

The evidence is accumulating that pellagra has probably existed in this country since the "big war," at least Gray and Tyler went on record with reports of cases in 1864—and it is worth recalling that it was at a meeting of this Association in this city—and there is reason to believe that the disease was prevalent at the same time in the Andersonville, Ga., prison. Dr. Wm. J. W. Kerr, of Corsicana, Texas, an assistant surgeon of the prison, is my authority for the statement. A former assistant physician in the South Carolina Asylum, Dr. H. N. Sloan, says the disease was recognized and called pellagra there in the early 70's but I have found no printed or written record of it. Dr. J. L. Thompson, for many years assistant physician, as well as old attendants in the same hospital, are now satisfied that they can trace the disease back to the early 80's. As stated above, Charleston physicians now admit the occurrence of pellagra in their city 20 years or more ago. In addition to the early cases mentioned in the paper last year, I have learned from Dr. C. C. Bass, that Dr. Bemis, of New Orleans, left a written diagnosis of a case in the Charity Hospital in 1889. Dr. Isadore Dyer, of New Orleans, had a case diagnosed as pellagra, and referred to him for treatment by an Alabama physician six months before Dr. G. H. Searcy observed the disease. So we may conclude that isolated cases of pellagra, natives and imported, have probably occurred in general practice and especially in asylums and hospitals for the last half century, although the diagnosis may not always have been correctly made. But after granting the occurrence of sporadic cases for a long time, we must admit that we are now passing through what seems to be a serious epidemic of pellagra.

A phase of the psychology of the problem has been the failure of the profession to recognize pellagra, if it has heretofore been

prevalent in anything like its present proportions. The explanation of, or the responsibility for this oversight, rests largely with the authors of English and American text-books of both general practice and insanity, who have told us, if they told us anything at all about it, that pellagra was an Italian disease that did not occur in our country.[6] But in 1882 Van Harlingen[7] announced that the disease was likely to occur in the United States at any time.

It is my impression that the discovery of the existence of pellagra in their institutions is not welcomed by some asylum officers. Recently while visiting such a hospital in which the disease had not yet been recognized, I saw and called attention to an unmistakable case, but I was not invited to extend my observations.

So careful an authority as Surgeon Rupert Blue, of the U. S. P. H. and M.-H. Service, states that he is "of the opinion that pellagra can be found to-day in nearly all of the insane asylums and almshouses of this country."[8]

This statement is probably too sweeping, but it serves to indicate how important it is that accurate statistics should be secured at an early date.

Less than two and one-half years ago, pellagra was but a shadow of a name to most of us. The increasing number of States reporting the disease, and the figures quoted above, indicate, to some extent, how common in some communities as well as how widely disseminated the disease is, and probably has been for some years in the United States. By asylum officers—shall I say in the South only?—pellagra is now becoming recognized as of great importance as a cause of insanity.

It is to emphasize the above facts that I have, after hesitation, undertaken, on rather short notice, again to present the topic of pellagra before you.

II. Psychology.

Recognizing our inexperience in dealing with many phases of the pellagra problem, we must admit for sometime to come our dependence upon European writers for authoritative descriptions of the mysterious malady. Hence I shall, for the second section of this paper, confine myself almost entirely, to reviewing and quoting from several articles and monographs upon the mental

symptoms of the disease, that have been written by Italian, German. French and English observers.

In the admirable description, given by Copland,[9] of pellagra it is stated that "The nervous system presents remarkable disturbance, and the manifestations of the mind are more or less disordered. The pellagrosi complain of a sense of heat in the head and spinal cord; of tingling and darting pains in the course of the nervous system, of heat in the limbs, palms of the hands, and particularly in the soles of the feet; of great weakness of the limbs, with trembling when attempting to stand; and sometimes of contractions of the lower limbs. Their looks become somber and melancholy. Ennui, depression of spirits, and mental imbecility, increase with the progress of the malady. Dr. Holland states that pellagrosi afford a melancholy spectacle of physical and moral suffering at this period. They seem under the influence of an invincible despondency, they seek to be alone, scarcely answering questions put to them; and often shed tears without obvious cause. Their faculties and senses are impaired and the disease when it does not carry them off from exhaustion of the vital powers, generally leaves them insensible idiots, or produces attacks of mania, soon passing into utter imbecility or idiocy."

Hack Tuke studied pellagra in Italian asylums in 1865. He says:[10] "The patients were in an advanced stage of the disease, and were all more or less emaciated, sallow, anemic, and presenting a miserable dry, wrinkled skin. They were obtuse and inert, their mental state being that of dementia, quiet, chronic mania; or, in some instances, chronic melancholia. None of them were in an acute maniacal condition."

The views of Salerio,[11] director of the asylum of San Servolo, Venice, upon the mental condition of his patients, may thus be summarized: They are generally frightened; think they are persecuted, or possessed with the devil, suspicious, refuse food and medicine, and have exalted religious notions. Suicidal tendencies may be present. Homesickness is common and severe. Finally, they are liable to lapse into dementia, paralysis, or tubercular diseases.

Bucknill and Tuke[12] quote also from an early work of Lombroso, who thought that one characteristic of pellagrins, sane or insane, was a greater moral impressionability. A slight insult,

the threatening of some trivial danger completely carries them away. If pellagrous insanity assumes a type, it approaches rather that of chronic mania and dementia than that of monomania. A real or apparent stupidity, an obstinate mutism, is tolerably common, which Lombroso, ingeniously terms "psychical catalepsy." But, as a rule, their insanity is of a misty, ill-defined, contradictory character, like that produced by old age, or by anemia, and differing in this point from general paralysis.

Morselli[13] gives four forms of pellagrous insanity, viz., supra-acute pellagra (typhoid pellagra), pellagrous melancholia, pellagrous dementia, and pellagrous pseudo-general paralysis.

Babes and Sion[14] say in part: "Usually after several years of somatic pellagra, psychical symptoms come into prominence. At first the patients experience mental weakness. The peculiar pellagrous lunacy is preceeded by spasmodic, then tonic cramps and general bodily weakness and advances to a true pellagrous paralysis. The cramps of feet, hands and calf muscles are sometimes so violent that they may result in epilepsy, contractions and swooning. So-called pellagrous epilepsy occurs as the result of spinal pain, the patient being drawn backwards. An important condition called pellagrous tetanus has been described by Strambio, opisthotonous being a common characteristic symptom. Sometimes the patients are drawn forward and fall to the ground. Choreiform movements, especially of the head, are observed, generally from the incipiency of the disease, depression and weakness of the memory are noted. Roussel asserts that in this stage deliria do not appear, but that they come on in the spring of the second or third year. The sadness may advance to mutism and refusal of food, these conditions often being interrupted by lachrymose, or maniacal or suicidal episodes. An acute attack leaves the patient exhausted, depressed and hypochondriacal. Such attacks recur annually at about the same time, the intellect weakens, and gradually dementia develops.

"Pellagrous melancholia shows various stages: at first, there are psychic impediments followed by apathy or stupor. Delusions of sin, of persecution, etc., appear. Mania is rare, but catalepsy sometimes occurs.

"When paralysis supervenes, euphoria appears, presenting a disease-complex like general paralysis, but even in advanced stages of the diseases remissions may occur.'"

G. Antonini [15] writes: "Already in the first stages of pellagra there appears a decided modification in the mental faculties; there is a great impressionability, a greater psychical excitability, a slight disappointment depresses greatly the tone of feelings, or produces excessive reactions (from the want of initial inhibitory powers). In the progress of the disease, we can have true amentia,* states of mental confusion, common to all psychoses arising from exhaustion. This state can show suddenly an aggravation of symptoms and lead to death with a syndrome of acute delirium (typhoid pellagra) and yet it can also present in certain cases a true progressive paralysis of pellagra.

"But a frequent symptom is the obstinate refusal to take food, such as aggravates painfully the already sad picture of the pellagrin."

Griesinger notes [16] that pellagrous insanity, according to Clerici (1855) consists chiefly in a vague, incoherent delirium, accompanied by stupor, loss of memory, and by loquacity without special disorder of intelligence, or violent excitement; the melancholic state, which predominates for a long time, always passes gradually into a state of torpor of all the mental powers, with muscular weakness, which greatly resembles general paralysis.

Mongeri [17] concluded that the pellagrous psychoses begin, ordinarily, with a period of mental depression accompanied by hypochondriac ideas. Following great mental prostration, the ideas become confused. Later melancholia appears accompanied by hallucinations of hearing, with illusions of general sensibility. Following this condition are delusions of persecution with a tendency to drowning (the hydromania of Strambio). Again developing persecutory paranoia, pellagrins commit crimes of every sort (homicide, infanticide, incendiarism, etc.). Dementia is the common termination.

We will next quote from Bianchi,[18] one of the leading modern Italian writers on mental diseases.

"The nervous phenomena dominate the scene in pellagra. We may classify the different varieties in two groups: The chronic and the acute. The first is characterized by general depression, melancholia, confusion, slow dementia, paresthesias and ataxic gait. Contractures and subsulti are absent, although in most in-

* By amentia Continental writers mean acute confusional insanity.

stances, the reflexes are exaggerated. In the acute form, we have elevation of temperature 39 degrees to 41 degrees C.; intense neuromuscular excitement, subsulti, contractures, muscular rigidity, exaggerated reflexes and confusion with phases of exaltation. There are numerous intermediate forms in which we observe a great variety of psychical phenomena, and also alternation of excitement and depression. Phases of remission and of apparent recovery are observed, especially at certain seasons."

Régis [19] announces, that, "It is recognized that the most common form of psychosis in pellagra is mental confusion with melancholy, or dreamy delirium. This occurs more or less marked in most of the cases. It is manifested by an inertia, a passivity, an indifference, a considerable torpor; by insomnia, hallucinations often terrifying, both of sight and hearing; by delirious conceptions, with fixed ideas of hopelessness, of damnation, of fear, anxiety, persecution, poisoning, of possession of devils and witches, of refusal of food, and so marked a tendency to suicide, and to suicide by drowning that Strombio gave it the name hydromania. This melancholy depression, which can reach, in certain cases, even to stupor, is always based upon a foundation of obtusion, of intellectual hebetude, and of considerable general debility, which becomes permanent and terminates by degrees in dementia, in proportion as the pellagrous cachexia makes new progress. It is accompanied sometimes by a polyneuritis. The mental confusion of pellagrins can, in place of changing directly into dementia, turn to a chronic mental confusion.

"One may also observe in pellagra, as in every chronic grave intoxication, a morbid state resembling general paralysis (pellagrous pseudo-general paralysis). This occurs especially in the cases where instead of habitual melancholy ideas, the patients present ideas of satisfaction and of wealth."

Procopiu [20] discusses the subject at length, saying in part: "We have seen that the character and intelligence of pellagrins change. They become sad, apathetic, silent; in the more advanced stage they are melancholy, and fall sometimes into an absolute mutism, or respond with difficulty, and have the air of not understanding what is said to them.

"Sometimes this melancholy is accompanied with stupor, and leads the poor pellagrins into dementia.

"It is not rare in this condition, that an attack of acute mania breaks out. At another time, the attack of mania breaks forth suddenly without apparent cause, or under the influence of a sunstroke, a quarrel, a disappointment, etc.

"Sometimes, it is in the spring that the excitement, as the other symptoms of pellagra, makes its appearance, but generally it is later than the others, and bursts forth at the end of the season, or even during the summer.

"Pellagrous insanity has been divided into acute and chronic forms.

"The acute form is more frequent when the pellagra is associated with alcoholism, then this form presents the characters of delirium tremens. The acute form often manifests itself in the course of the chronic form, but it can also begin in the state of apparent health.

"The acute insanity in particular which bursts out suddenly while the patient is in a state of mental health, is easy enough to cure. But when the disease is advanced, and the lesions of the nerve centers are profound, cure is difficult, sometimes impossible, especially in the case of dementia. When even a sensible amelioration is obtained, the intellectual condition of the patients remains always in a marked degree of inferiority."

From the more recent treatise of Tanzi[21] we learn that "Pellagra is almost always accompanied by psychical disturbances, which often have the character of true mental diseases.

"A pellagrous melancholia and a pellagrous mania have been described. The characteristic psychosis of pellagra is, however, amentia, which manifests itself acutely in loss of sense of place, loss of memory, confusion, hallucinations, and paresthesias, from which there arise morbid impulses and delusions. Pellagrous amentia, often assumes a depressive form, which simulates melancholia, and in some cases either from time to time, or throughout the whole course of the psychosis, it is accompanied by exaltation, which gives it some resemblance to mania.

"The first attack of amentia occurs after pellagra has existed for some years, and has already given rise to erythema, and diarrhea, and has remitted from time to time. In other words, the pellagrous lunatic is, as a rule, a chronic sufferer from pellagra. But whilst the pellagra, although chronic, continues to run an

intermittent course, the mental disturbances associated with it have the characteristics of an acute insanity, which corresponds exactly to amentia, *i. e.*, to the most typical of the acute insanities, both as regards the symptoms and course.

"The insanity of pellagra is thus something different from common melancholia, or from ordinary mania. It is also something more than simple amentia. We may regard it as the combination of two distinct clinical pictures; namely, that of amentia in the first attacks, and that of dementia in the later and progressive phase, marked by chronic and incurable cachexia. It is an intermittent and progressive amentia, which, if not cured or if not early fatal, terminates in dementia."

What is the relationship of pellagra to progressive paralysis? Baillarger asserts that pellagra may be followed not only by mania and melancholia, but also by progressive paralysis. Verga opposes the last opinion, while Régis and Piannetta affirm it (Gregor).

Gregor[22] in 1907, recognizing that exhaustive clinical observations on the so-called mental disturbance of pellagra were wanting, made careful analyses of the psychic condition observed in 72 cases, who had been admitted to the Bukowina State Asylum from March, 1904, to September, 1905. In 1902, he says, Finzi published his "Psicosi Pellagrose," coming to the conclusion that this mental disturbance is essentially an insanity, and that the psychosis of pellagra is amentia. This view, which agrees with that of Tanzi was combated by Vedrani, who maintains that the psychosis of pellagra takes usually its course without serious disturbances of orientation and reason. On the other hand, Warnock[23] claims that symptoms of melancholia are the usual accompaniments of the mental disturbances in pellagra, and thus approaches the views of the older writers, who assumed especially close relations between pellagra and melancholia. Thus Aubert tried to prove in 1858 that an attack of pellagra might convert an heterogenous disease into melancholia. This view was vigorously maintained by Aubert against Baillarger and others, who held that the psychoses of pellagra are polymorphic, including meningitis, mania, melancholia, etc., and even general paralysis. This view is still maintained notably, by Zletarovic, who has observed the development on the basis of nutritive disturbances caused by pellagra of melancholia and mental weakness to complete stupor

and dementia, but he never observed mania. Even Lombroso and Tuczek, says Gregor, give only pictures of psychical conditions. Gregor also considers the studies of pellagrous insanity by Finzi and Vedrani as inadequate. But granting the absence of a characteristic symptom-complex, he says that we must still search for characteristic peculiarities, since psychoses, which are in themselves not specific, may assume certain symptoms, which are to be considered with regard to their etiology.

Gregor also included in his study whether the relationship between pellagra and the psychoses was accidental or casual. It will thus appear that he attempts to reach a much broader and deeper conception of the neuroses and psychoses of pellagra. He divided his 72 cases into seven groups: (1) Neurasthenia, (2) acute stuporous dementia, (3) amentia (acute confusional insanity), (4) delirium acutum, (5) katatonia, (6) anxiety psychosis, and (7) manic-depressive insanity.*

Gregor analyses most of his cases at length, finally summarizing the symptoms he had observed.

I. Neurasthenia (Seven Cases).

The symptoms of Gregor's first group in their details are not specific of pellagra, but offer in their totality a characteristic disease picture.

The symptoms are subjective and include headache, pain in the gastric region, vertigo, paresthesias, lassitude, depression, a sense of unrest and anxiety, which may be raised to a phobia, as well as ill-defined apprehensions. There is also a sense of bodily and mental incapacity, and of illness. Their conduct is normal, and the intellect may be unimpaired, but they are incapable of mental and physical exertion. The process of association is distinctly

* In Stoddart's recent work (24), these varieties of exhaustion psychoses are recognized:

1. The depressive form. (Associated with motor restlessness).
2. The excited form. (Exaltation: always with motor excitement).
3. The stuporose form. (The patients are quiet and rigid, the rigidity affecting the trunk and limbs, and they have terrifying hallucinations, and consequently are in a state of extreme depression).
4. A form of "collapse delirium" as recognized by Kraepelin.
5. The katatonic form of dementia præcox.
6. There is also an intermittent form of psychosis tending to dementia.

disturbed, the simplest question often being answered only after prolonged hesitation. With depression of spirits, hypochondriacal notions may develop from a consciousness of being pellagrous, or from experience in former illnesses. In some cases there is a slight motor unrest, and a desire to move about, but as a rule patients of this group labor under motor impediment, and sink finally into a condition of apathy and resigned inactivity. Gregor admits that these symptoms are not specific of pellagra. But he suggests that, if these symptoms have lasted for several years, the suspicion of pellagra as a causative factor, should be aroused in the physician's mind, even without the presence of the somatic stigmata of the disease. He also observes that the first attack of pellagra is more likely to be accompanied by neurasthenia and that this condition commonly precedes the development of the other pellagrous psychoses.

II. Acute (Stuporous) Dementia (Ten Cases).

The milder cases of this group differ from the preceding group only in degree. The symptoms merely suggested in the former group exist here in full force. The cases of this group are characterized by a distinctly marked stupor, tending to remissions, by deep mental depression, a vivid sense of insufficiency and peculiar subjective troubles. The dependence upon pellagra intoxication can be established by the close connection of the psychic disease-picture with the somatic symptoms of pellagra. The mental symptoms improve with the bodily. The external appearances, the depressed mental condition, the tendency to suicide, etc., explain the fact that such cases are frequently considered melancholia. Finzi contradicts this view, and places these cases under amentia. Some of Tanzi's and Vedrani's cases also come under this group.

The patients give the impression of being sick, as they lie still and apathetic in bed for weeks, and answer repeated questions only after a painful effort, or not at all. Requests of the simplest nature are carried out only with hesitation and effort, and often the action once begun is interrupted in its first phase, or the request is forgotten. Mostly we are assured that the patients are well oriented, and often we see after the hesitation ceases, that the psychic activity is revived for a short time, but sometimes in the

height of the disease orientation may also be disturbed. Illusions appear, the patients show a sense of insufficiency, and sometimes also a hypochondriacal sense of sickness, and a consciousness of their psychic impediments.

In many cases in which the stupor developed gradually a disturbance of psycho-motor activity was observed without vivid mental disturbances. On the other hand, some cases, recognizing their incapacity for practical life, voluntarily committed themselves to the asylum. Most cases showed a gradual development of an affectless stupor, with a final return to their former mental condition. Rarely psychic impediments develop in a relatively short time. The sense of insufficiency may assume a distinctly melancholy coloring, with suicidal tendencies. Again severe cases may assume temporarily katatonic symptoms of posture and motion stereotypies.

With this group, memory disturbances were especially well marked, as Tanzi has emphasized, but weakness of memory is not a characteristic of acute pellagrous dementia. Upon convalescence memory returns easily, so that the apparent memory disturbance is due rather to the general difficulty of performing psychical processes than a weakness.

With the relief of the somatic symptoms of acute pellagra, the mental symptoms also improve. Besides, the connection between pellagra and nervous disturbances is evident, and different mental symptoms may complicate the picture. It would appear that melancholia is the typical mental disturbance of pellagra. Tanzi believes that we should call such cases amentia, and consider them slight forms of this psychosis. It is in this group that Tanzi would place the typical cases of pellagrous insanity. Stupor seems to promise a long duration, and an unfavorable prognosis. Favorable cases lasted from one to six months.

III. Amentia (Acute Confusional Insanity) (Thirty-Two Cases).

These cases were long continued with a tendency to remissions and intermissions. After a prolonged period, which shows essentially the symptoms of the first group, appear usually terrifying hallucinations, accompanied by violent motor excitement. The

delirium was frequently followed by stupor, or existing stupor was interrupted by delirium. The patients see the house or village burning, enemies coming, wild animals attacking them, the devil appears, or machines cut off their heads. More rarely, they have quiet dreamy states, the heavens open and the Lord appears, bishops, priests, figures, etc., pass by. In imagination they return to the scenes of their daily life. Again, they run away to escape the flames, or to defend themselves against persecution. Here we have phenomena of motion in connection with hallucinations. If secluded, they move about, are noisy and knock upon the door. The duration of this excitement varies from a few hours to several days. Theses episodes are followed more or less by long intervals in which the patients are quiet in mind and body. They may be stuporous, but usually show only slight disturbance of orientation. Later they pass into a delirium like that of meningitis or typhoid. If diarrhea be present, the complex of typhoid pellagra is recognized. This may develop in a chronic case, or be an acute process. While in rare cases the bodily and mental symptoms may improve, death usually follows this typhoid condition. Hallucinosis seems to offer for the first attack a decidedly favorable prognosis.

Dementia does not always ensue upon a severe initial attack, but develops in chronic cases of either bodily or psychic pellagra. The development of katatonic symptoms, which may appear especially in youthful cases, renders the diagnosis difficult.

IV. Acute Delirium (Two Cases).

The cases of this group are distinguished from those of the third group by the intensity of the disease symptoms, hallucinations, motor excitation, and shorter courses ending in death. For this reason, the conception as acute delirium seems justified.

The symptoms of this condition may occur without the bodily sings of pellagra. But they usually occur synchronously. Absence of a rise of temperature has been noted by both Italian and German observers.

Groups II, III and IV show a great similarity with the mental symptoms of acute infectious diseases. They might, therefore, be classified under the infective exhaustive psychoses.

V. Katatonia (Ten Cases).

The katatonic condition occurs with acute somatic pellagra. Here, considering the concurrence of acute somatic and psychic pellagra, we must assume a pellagrous intoxication as to the causative factors, as in pellagrous neurasthenia. Many patients show consciousness of their disease. Hallucinations may precede this condition. Excitement, stereotypy, wild jactitation and verbigeration are common. The katatonic cases pass rapidly into dementia.

Of the cases of the fifth group, the majority belong to the katatonia subdivision from the symptoms, course and termination. In three cases (females), excitation occurred, ending with stereotypy, jactitation and verbigeration. The patients did not show marked affects. In one case, hallucinations preceded the condition. In all three cases, the transition into dementia was rapid, in which posture and motion stereotypies, impulsive actions and talkativeness were observed. In one case, these symptoms were followed by a permanent negative phase. In another case, besides many posture and motion stereotypies, and interchange of negativism and *flexibilitas cerea* was observed. In one case, the katatonic symptoms were marked from the beginning. A male case, showed on admission to the hospital, katatonic excitation, and after a few days a remission followed by another katatonic phase.

Six of these cases ended in dementia more or less rapidly, although remissions may occur.

VI. Anxiety Psychoses (Three Case:).

The violent, fluctuating anxiety affect, the motor unrest, the anxiety ideas, and the "phonemes" completing them, determined from the first the diagnosis of an anxiety psychosis. It is true, this disease picture is complicated by extraneous features. The patients show a marked sense of insufficiency, appear slightly stuporous in the intervals between attacks and resemble cases of groups II and III. Later after the anxiety attacks have disappeared, the mental weakness increases, the second phase gradually lessens as it does in patients of the group mentioned. In the second case, the psycho-motor weakness changed by turns with violent anxiety affects and vivid motor unrest. Temporary ideas of persecution, and of sin, and later of stupor were also observed. The third case was typical depressive melancholia.

VII. Manic-Depressive Insanity (Two Cases).

Of the two cases, one showed the condition of mania arising from subjective pellagra troubles. In the other, mania was followed by a distinct stupor.

Spinal Disturbances.

Gregor verifies Tonnini's observations upon the spinal symptoms of pellagrins. These are: Increase of the tendon reflexes, increase of mechanical muscular excitement, tremor of the fingers, rigidities and spasms of the leg muscles, spastic gait, diminution of the tactile, thermal, farado-cutaneous sensibility; paresthesias, ataxia of lower limbs and in rare cases, of the upper extremities; and Romberg's symptom. Also muscular spasms; tonic spasms being present in patients in the terminal stage of pellagra, but clonic spasms are also observed, and these without the symptoms of typhoid pellagra. Paresis of the lower facial nerve was also noted.

Dementia.

The dementia following pellagra shows different forms. One form develops an almost complete disappearance of mental activity, which justifies the names "paralytic." But a milder degree of dementia characterizes the larger number of cases. They are oriented, usually well-behaved, but dull and showed a lack of self-restraint, with a tendency to break out into violent passion and impulsive actions.

A simultaneously existing alcoholism has a modifying influence upon the disease picture. Furthermore, in many individuals, the pellagrous mental disturbance does not appear until old age, and it brings about a precocious senile dementia.

There is a distinct pellagrous dementia, like paresis, marked with somatic changes. An affirmative answer is given to the question: Are there disease pictures of dementia, whose anatomical basis is an injury to the brain by the toxines of pellagra?

Termination.

Of 42 non-fatal cases, 21 were first attacks. Of these 17 recovered and four became demented. The others (21) had already passed through former psychoses. Of these seven were cured and 14 became demented. These figures prove how unfavorable for complete cure the pellagrous psychoses are.

Of the 72 cases, Gregor classified under the amentia group 32, the dementia and katatonia 10 each; neurasthenia 7, anxiety psychosis 3, manic-depressive and acute delirium 2 each. The other cases making up the total were excluded for alcoholism, etc. These figures show that not a sufficient number has been studied for final conclusions. The further studies and reports promised by Gregor will be awaited with interest.

Gregor's General Summary.

In pellagra there occur mental disturbances, which belong to different forms of psychoses. The first three groups must be considered as pellagrous from their development, symptomatology and course, being caused by the pellagrous intoxication of the central nervous system. The assumption of a pellagrous dementia is justified; it can be delimited in the terminal stage from dementia paralytica, which is alone to be considered differentially. Weakness of memory is not a characteristic sign of pellagra, its apparent presence being really a sign of psychic impediments. The many-sidedness of the condition picture explains the view that all forms of mental disturbances may occur in pellagra. Pellagra does not cause true melancholia, and depression in pellagra is not dependent upon exhaustion, since it occurs also in well-nourished cases, and in favorable conditions of life. The contradiction between the views of Finzi and Vedrani is explained by the fact that both had not the same picture before them. Further, hallucinations and disturbances of orientation occur episodically in pellagrous psychoses. Among the spinal symptoms, the marked diminution of farado-cutaneous sensibility and the occurrence of clonic muscular spasms in the so-called second stage deserve special mention.

As will be seen, Gregor's classification also is not above criticism; katatonic conditions are observed in his dementia and amentia groups, and his acute delirium differs only in degree from some of the same cases. Paranoiac symptoms appear in the patients of several groups, and stupor with his anxiety cases. A neurasthenic condition preceded all other psychoses, but his paralytic cases equally deserve separate grouping. He admits typhoid pellagra without temperature, and pellagrous neurasthenia without somatic stigmata, while renouncing *pellagra sine pellagra.*

The only careful consideration of this broad subject that has come to my knowledge by an American physician, is that by J. W. Mobley[25] of the Georgia State Sanitarium. He says his cases fall principally under the intoxication, or infective-exhaustive group, and he has subdivided them under four headings:

1st. Acute intoxication psychosis, with psycho-motor suspension.

2d. Infective-exhaustive psychosis, with psycho-motor retardation or excitation.

3d. Symptomatic melancholia, with psycho-motor retardation.

4th. Manic-depressive, with psycho-motor retardation or excitation.

Bassoe of the Illinois Pellagra Commission, according to Hyde, after careful neurological examination of 19 cases divided them into three groups: those with probable degeneration of the pyramidal tracts; those with degeneration of the posterior columns, and those with combined degenerations. These clinical results are largely confirmed by the pathological findings (Bowen and Towle).[26]

The question now arises: Under what group shall pellagrous insanity be classified?

Bucknill and Tuke[27] classify it with alcohol under toxic insanity. Régis[28] places the pellagra psychosis with the psychopathies of exointoxications; Mongeri[29] under the infective psychoses, between the post-influenzal and Korsakoff's disease.

Bianchi[30] classifies pellagrous insanity under the toxic psychoses, with alcoholic, morphine and cocaine conditions, and separately from the infective group.

Tanzi[31] considers it a toxic insanity.

Conclusion.

It is now established that pellagra in the United States extends from the Atlantic to the Pacific, and from the Great Lakes to the Gulf of Mexico. The disease, therefore, is no longer merely of academic interest to the American physician, be he alienist, or neurologist, dermatologist or general practitioner.

It is probable that pellagra has occurred sporadically in this country for 40 to 50 years, but it is certain that for the last three or four years it has appeared in epidemic form.

Numerically, its prevalence cannot be accurately or even approximately stated, but its wide geographical distribution emphasizes the need of vigorous, intelligent investigation into its causation, prevention and treatment on the part not only of medical profession, but also by both State and Federal governments.

The association of pellagra with nervous and mental symptoms is common. This relationship is that of direct cause and effect, and is not an accident or coincidence.

Cases of pellagrous insanity have usually suffered from pellagra with neurasthenic symptoms for sometimes before the development of mental symptoms. The psychoses are, therefore, as a rule the result of a chronic intoxication. At least this is the conclusion in Europe; whether it always holds good in this country is doubtful.

Some cases of pellagrous insanity appear to belong to the infective-exhaustive type of mental diseases, and others rather to the toxic group. In view of the fact that these two groups have been embraced under the comprehensive term of confusional insanity, many cases of the pellagrous psychoses may better be included under the general heading of confusional insanity.*

It seems to be admitted that the mental condition of pellagrins undergoes an early modification. This early mental state may be ill-defined or show itself by a greater moral impressionability, or greater psychical excitability, or it may be described under the general term of neurasthenia. Later inertia appears, the patients are apathetic, and show psycho-motor impediments. There is said to be intellectual hebetude, stupor or even mutism. Lombroso's "psychical catalepsy" may appear. If they are not silent, pellagrins respond with difficulty, or have the air of not understanding what is said to them. Insomnia is almost universal, and depression (psychic pain), is characteristic. Stupor often ensues, and confusion, the type of exhaustion and intoxication psychoses,

*It may be well to place here a summary of Kirby's views of the symptoms of confusional insanity (32): "A relatively short course, some delirium or very marked confusion, hallucinations, unsystemized delusions and later stupor and mental enfeeblement. Delirium varies according to the character of the individual and therefore may be absent or very severe and fatal. Hallucinations, delusions and disorders of memory and orientation vary in individuals and groups."

dominates the scene. The patients appear frightened, become suspicious, have ideas of demoniacal possession, refuse food and medicine, are subject to hallucinations, illusions and delusion, are suicidal (hydromania) and have other criminal tendencies. Episodic disorders of memory and orientation are observed.

The effort is sometimes made to classify the mental condition of pellagrins as acute and chronic. In *the acute* form, the commoner symptoms are: Temp. 39°-41° C. Neuro-muscular excitement, subsulti, contractions, muscular rigidity, exaggerated reflexes, confusion with phases of exaltation, and marked insomnia.

This condition is said to be more common with alcoholism but may occur at any stage of the disease.

Chronic. Depression, confusion, paresthesis, hallucinations and illusions, memory disturbances, insomnia, exaggerated reflexes, ataxia and terminal dementia.

Intermediate forms occur, being marked by alternations of depression and exaltation with remissions and apparent recovery. Excitement may break forth without cause, especially in the spring and summer.

Polyneuritis is sometimes observed.

For the chronic form, dementia is the common termination, but it may be complicated by paralysis or tuberculosis.

In the first attacks the pellagrous psychosis is an amentia (confusional insanity). In the later and progressive phase, marked by chronic and incurable cachexia, it is a dementia. It is an intermittent and progressive amentia, which, if not cured, or if not early fatal, terminates in dementia (Tanzi). Or it may end in chronic mental confusion or in pellagrous pseudo-general paralysis (Régis).

Depression and confusion are the more common mental symptoms associated with pellagra, but periods of exaltation (excitement) also occur.

Exaltation and delirium seem to occur in pellagra in at least three forms. *First.* As temporary episodes of excitement lasting for a few hours or a few days. *Second.* As an acute collapse delirium, usually fatal in from one to two weeks. This may occur so early in the disease as to constitute an initial delirium. Though rare in Italy this form is far from uncommon in the United States and it constitutes many of the cases of so-called acute

pellagra now frequently reported in this country. *Third.* Another form of delirium is that which develops in the terminal or cachetic stage of chronic pellagra: this is the typhoid pellagra (pellagra typhosus) of which much has been written and which is comparatively rare both in Italy and the United States. It is this terminal condition of long standing pellagra, which Lombroso calls typhoid pellagra, but other authors, as Morselli, confuse the acute collapse delirium of pellagra ("supra-acute pellagra") with it.*

Strictly there is no mental symptom-complex characteristic of pellagra, but pellagra may act as the exciting cause of several forms of nervous and mental states, varying from neurasthenia to polyneuritis and meningitis and from simple depression to paretic conditions, and dementia.

Under the influence of the pellagrous intoxication, patients commit crimes—suicide (hydromania), homicide, infanticide, incendiarism, etc.

According to the degree or duration of the pellagrous intoxication or possibly from idiosyncrasy, the patient is liable to develop the symptoms of acute collapse delirium at any time, and die in the attack, though recovery is possible.

It is not unlikely that the mental symptoms of pellagra may differ by seasons or in different countries and in different parts of the same country, just as broadly speaking, do the physical signs and symptoms of the disease.

After all may not Baillarger be right in questioning whether the pellagrous poison does not like alcohol, produce these various neuroses and psychoses according to the varying relation of different individuals?

Finally in the language of Dr. Zeller, when we understand what pellagra is—"root and all and all in all"—shall we not better understand what insanity is?

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* Procopiu asserts that Landouzy erred in seeing in this condition an acute pellagra, because this condition always manifests itself after a long period of chronicity.

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