A STUDY OF PATIENTS SUBJECT TO CONVULSIVE SEIZURES¹

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Upon undertaking a study of this kind it appeared that an appeal to several classes of thinkers in this field of work would necessarily have to be made. There are those who think of the human organism in terms of structure and the most extreme of them would have it dead and static that they might be the more certain of their observations. Then there are those who have become more liberal in their projections. They are masters of anatomy but have developed a lively interest in the living being. They are often overwhelmed by the dynamics of life. More recently are some thinkers who regard the pure anatomy and elementalistic conceptions of physiology as the German who said, while gazing upon Niagara Falls after his friend had remarked at the wonder and splendor of it: "Sure, it's fine; there is nothing to hinder it!" This latter school is busy with gross reactions—behavior, if you please. To them a few altered heart beats or a few pathological respiratory movements are only parts of a greater whole, about which ancient philosophers inquired in the simple words, "What is he trying to do?" On slightly different bases there are at least two classes. Some prefer the study of large groups of patients with respect to many characteristics or functions, in contradistinction to persons interested in few cases or even very selected aspects of a case.

The subject under discussion is of sufficient range to include the interests of any class cited and it is hoped that some of the observations recorded in this study will stimulate the various thinkers in their realms of activity. It is hoped that the near future may bring forth the type of persons that will not fail to see the whole and all of its parts in clear perspective.

For this study twenty patients in St. Elizabeths Hospital were selected at random (except that they possess sufficient ability to co-

¹ The writer wishes to acknowledge his indebtedness to Dr. Daniel C. Main, Clinical Director of St. Elizabeth's Hospital, for the encouragement given and interest shown in the pursuance of these studies.

operate somewhat) among those on whom a diagnosis of epilepsy was made on admission. A brief summary of the history of each case follows and hereafter any one of the cases will be referred to by the number which is given to it in this brief history.

CASE 1. C. P. C. A. Born 1860, in Louisiana. Paternal grandfather died at 45, presumably of apoplexy. He weighed about 300 lbs. at death. Has a sister who had convulsions as a child. Father and grandfather drank to excess. Patient is sixth of seven children. Had measles, smallpox, scarlet fever and typhoid as a boy. Epileptic attacks began in infancy and continued to his eleventh year; was free of them until his 18th or 19th year. During babyhood thrown from toy wagon on his head and rendered unconscious for a while. Began school at 5 and went to 18th year, completing 1 yr. of high school. He has done very little work. Has been an observer of the weather and natural phenomena. Attacks are mostly of the grand mal type though they are petit sometimes. At times instead of falling he walks about in a dazed condition. He has threatened violence on his relatives on one or more occasions. He denies venereal infection. Blood Wassermann negative.

CASE 2. W. G. B. Born in Ohio, 1899. Family history appears negative. Patient youngest of 4 children. Usual diseases of childhood. Scarlet fever at 15. Epileptic fits since 9. Had them nearly every day—sometimes 4 or 5 a day. Began school at 8 and went to 14. Learned well. Enlisted in U. S. Navy in 1917. Discharged in 1918 because of seizures. Practiced onanism from 6 to 17. Total abstainer. Denies venereal disease. Thinks onanism brought on attacks, and reproach of teachers and others who learned of it aggregated it. Blood Wassermann negative.

CASE 3. D. J. C. Born in 1875. Labor hard when born. Family history apparently negative. Had scarlet fever at 2. Started to school at 6 or 7. Reached the 6th grade at 15. Failed in 4th grade. Played truant at times. Went to a business college at 15 and also learned barber trade and telegraphy. Worked at various jobs until 1896 when he enlisted in Third Wisconsin Volunteers and was sent to Porto Rico where he served 6 mo. and then returned to Wisconsin. At 8 was struck on head by well wheel. Had malaria in 1899. Had typhoid at 17 after which his disposition seemed to change. Was irritable and argumentative. Spells began about the time of his return from the Spanish War in 1899. Since, he has had 2 trephine operations. Was married at 20 but could not get along with wife. Attacks are of grand mal type and were mostly nocturnal at first, but not now. Wassermann of blood serum negative.

CASE 4. S. G. Born in Philadelphia, Pa., in 1891. Family history apparently negative. Patient second of 3 children. Had typhoid as a child. Had 3 falls as a child and injured his head. In March, 1917, he had a convulsion in bath tub where hot water was turned on and his feet were badly scalded. Went to school from 6

to 14 when he was expelled. Was in an orphanage from 5 to 10. Ran away from home at 16. Wanted to see the world. Enlisted in the U. S. Marines. Has been drunk and arrested for vagrancy. Had gonorrhoea in 1910 and 1917. Practised onanism as a boy. In June, 1918, he was put on the sick list for having what seemed like grand mal attacks. Following this he had hallucinations and delusions of a religious nature. He tends to wander about, not knowing what he is doing at times. Noguchi on blood negative.

CASE 5. A. H. Little can be learned concerning this patient's history except that he was in the U. S. Army in the Philippine Islands at the time of his first seizure. Claims he was hit across the mouth by the horns of an animal while butchering and most of the front teeth were knocked out at this time. Attacks came on about 15 days after this. He is reported to have been a healthy child. Had whooping cough at 2½ yrs. of age and measles at 8. Had nocturia until about 6 yrs. of age. He denies venereal infection. Blood serum Wassermann is negative. Seizures mostly grand mal but are mixed in type. He is religious at times but steals and commits minor crimes if not supervised.

CASE 6. G. W. H. Born in Ohio, 1858. One sister had "fits." Started to school at 7 and went until 19, getting to the highest grade in school. Worked on farm and at carpenter trade. Joined U. S. Army at 35. Served 3 yrs. and was discharged because of epilepsy. He had typhoid at 25. Had usual childhood diseases. Denies venereal infection. Was married at 36. Has a son living. Daughter died in infancy of fever. Used alcohol but denies excessive use of it. First attack at 33. Usually at night. Grand mal type. Attempted homicide and suicide in 1914. Wassermann of blood serum negative.

CASE 7. V. J. Born in Poland in 1873. Much evidence of neurotic determinants in family. Patient 8th of a family of 11, one member of which went insane, and another was a hypochondriac. Had smallpox at 2. When 10 went to Realschule but failed to pass an examination and quit but took a position as clerk for a tutor about 2 yrs. Came to Chicago at 18. Worked as laborer. Went to night school. Won scholarship in Chicago University for passing highest entrance examination. During college course taught night school. Specialized in science and languages. During his Senior year in University he started a fire in a stove and used too much kerosene; stove exploded; ran across street to sister. Took off coat, lay down in bed and had convulsion resembling those he now has. No outcry; no aura; except feeling of illness. Had a love affair which terminated when the girl learned that he was epileptic. He began to read books on mental diseases and kept a diary recording his seizures, which according to his record varied from 7 to 18 a year. Wrote newspaper articles. Became an interpreter for the State Dept. in Washington at which his efficiency varied so as to demote as well as promote him at times. In July, 1909, patient's mental condition became alarming and since, he has presented a most diverse and interesting picture, at times being

violent and threatening. He had gonorrhoea in about 1897 or '98. This worried him. Thinks he has never had syphilis. From puberty he has made a poor sexual adjustment. Wassermann of blood serum negative.

CASE 8. J. J. Born in Washington, D. C., 1881. Father used alcohol freely. Placed in a German Orphan Asylum when young. Failed in arithmetic in school. Got along fairly well in other subjects. Worked at odd jobs. Joined U. S. Navy at 16. Served until 21. Fell in street in New York while on 48-hour leave from Navy. Discharged from U. S. Navy for disability. Married in 1900. Lived with wife 2 yrs. No children. Attacks are grand mal in type and patient usually becomes excited before them and tends to be violent. Wassermann of blood negative.

CASE 9. A. J. M. Age 46. Born in Chicago. Attended school from 6 to 9. Worked in a lumber yard until 14 or 15. Changed jobs frequently following this, not bettering his previous occupational status. At about 20 he enlisted in the First Cavalry in Philadelphia. Did this because he liked horses. Has used alcohol to excess since 18. Practiced onanism as a boy. First heterosexual indulgence at 14. Denies venereal diseases. He was stricken with sunstroke in Aug. or Sept., 1915, in the Philippines, following which he had convulsive seizures at irregular intervals. They seem to come when he feels his best and without warning. He was accused of sexual perversion in the Soldier's Home and threatened the life of the physician who made the accusation. Seizures are mostly of grand mal type. Patient resents talking about his parents and home life. Wassermann of blood serum has been two plus once, and three plus at another and subsequent examination.

CASE 10. L. E. M. Born in Washington, D. C., in 1890. Family history apparently negative. Had mumps and scarlet fever at 6. At 16 he fell on his head from a trapeze. One year after this the epilepsy started as spells of unconsciousness. They occurred at night mostly. They increased in frequency. At 19 he had as many as 16 a day. Was trephined but this did not cure. Worked at various jobs. Practiced onanism from 15th year occasionally. First heterosexual experience at 22. Drunk once only. Drank only occasionally. Seizures of mixed type. Wassermann negative.

CASE 11. W. I. N. Born in Maryland in 1886. Learned to talk and walk at the usual age. At 8 years of age had hemorrhages from nose. At about same age had fainting spells which continued for two years. Had measles and whooping cough at 7 or 8. Attended school from 8 to 17. Never repeated grades in school. Left school to become a clerk in country store at which he worked for 2 months when he came to Washington and took a position with a company, with whom he stayed until admission to hospital. He was married at 25 and 6 months after marriage began having convulsions. At first they were of the grand mal type but later seemed to be petit mal. Following attacks he would become confused and frequently wandered about. Patient states that his mother disapproved of his marriage which worried him somewhat.

Denies venereal disease. Mother thinks his illness was caused by a fall. Patient thinks his illness was brought on by over sexual indulgence. There was some alcoholism in family. Patient total abstainer. At times he is apparently hallucinated and he has definite delusions of a religious character. Blood Wassermann negative.

CASE 12. C. L. O. Born in 1896 in Washington, D. C. Labor rather hard. No alcoholic or psychopathic determinants in family. Oldest of family. Had measles and some "kidney trouble" as a child. Said to have had nocturia longer than the average child. Began school at 7 and got to 6th grade when 15. Began to work in tin shop at 16. Worked irregularly from place to place because of seizures. Seizures began at 7 and were mostly at night. They seem quite frequent and are mostly of the petit mal type. Mother thinks them due to a fall.

CASE 13. E. A. O. Born in Chicago in 1876. Family history apparently normal. Third in order of birth. Measles at 10. Chicken pox at 12. Began school at 6. Did not like school and attended irregularly. Seizures came on in 1902 as sinking spells and have continued about every 4 weeks. They are followed by malaise and severe headache. Blood Wassermann negative.

CASE 14. H. K. Patient knows nothing of his family. Was brought up in an orphan asylum. Born in 1898. He knows nothing of his early life. Went to a school for feeble-minded. Got as far as the 3rd grade. Thinks his slow progress in school was because the other children made fun of him. Learned to crochet and knit and embroider. Sold what he made to visitors. Denies onanism as well as any sexual experience. Thinks attacks began at about 8. Can be brought on by being in a hot room a while. They are usually preceded by a feeling of stupidity and weakness. They are of both types. Feels badly after an attack.

CASE 15. I. N. S. Born in Ohio in 1871. Family history apparently negative. Began school at 6 and got common school education until 16. Better in arithmetic than other studies. Occupational history negative. Enlisted in U. S. Army at outbreak of Spanish American War. Was sent to Cuba. In Cuba he had heat stroke which he thinks brought on his convulsions. Had typhoid. Was told he had seizures while in hospital with typhoid before 1899. Worked until 1902 at various jobs. Got married in 1902. Had 2 children. It was in 1904 that dizzy attacks began to come on and got worse until 1907. In 1908 he was forced to discontinue work because of them. At times he became vicious and after a stay at a Soldier's Home was admitted to this hospital. Denies venereal infection. Wassermann of blood negative. Used a drug for a time that contained much chloral. Used alcohol some.

CASE 16. M. S. Born in Pa. in 1889. Family history negative. Learned to walk at 2. Talked at 1½ yrs. of age. Learned well in school. Quit school to make money. Held numerous jobs; some quite good, others poor. Persuaded to join U. S. Army. Denies having heterosexual experience. Denies onanism. Had

convulsions at 16 or 17 in New York which were brought on by being attacked by footpads in Broadway. Lasted nine months and then he had no more until 21 when he had attacks but was cured by a patent medicine. Attacks returned at 24 after being kicked by a horse. Cured again by patent medicine. Sent to hospital in 1917 for epilepsy. Denies venereal infection. Wassermann negative.

CASE 17. H. T. Born in D. C. in 1876. Family history negative except that brother had epilepsy. Lower jaw fractured by kick of mule at 12. Was in bed 6 months following this. Never went to school before this because teachers could not understand him. Cannot read, write, or spell. Had spells following injury to his jaw. Never had any regular occupation. After death of parents was at poor farm. Used alcohol to excess. Denies venereal infection. Spells came about once a month at first. Were of grand mal type. Confused before attacks at times. Has hallucinations and delusions of a religious character. Wassermann negative.

CASE 18. O. B. T. Born in Indiana in 1891. Family history incomplete. Father alcoholic and separated from mother. Patient older of two children. Had ordinary childhood diseases. Went to school from 7 to 15 and reached 8th grade. Worked at different jobs successfully after leaving school. Joined U. S. Navy at 17 and served one enlistment. Never received any court martial. After discharge he went from place to place, never staying at any place long. Thought his mind was affected all the time after discharge from the Navy. Re-enlisted in U. S. Navy in February, 1919. In the same month he was put on sick list for falling from his hammock and receiving wounds about face. More history elicited the fact that he had been at reform school and hospital for insane in Indiana previous to his enlistment. At times he threatened relatives with violence. Blood Wassermann negative.

CASE 19. F. T. Born in Germany in 1880; only son of a family of two. Had usual childhood diseases. Family history negative. Came to this country in 1898. Was in Spanish American War. Went to P. I. Had beri beri there—also malaria. Lost right arm 5 yrs. ago. Was educated at Heidelberg University in art. Thinks his first seizure came about 2 yrs. ago. Denies venereal infection. Seizures of grand mal type. Blood and spinal fluid Wassermann negative.

CASE 20. H. O. Z. Family history negative so far as determined. Born in 1880 in Ohio. Attended school from 6 to 16 and learned well. Worked in meat market until outbreak of Spanish American War when he enlisted in U. S. Army. Was in army 5½ months. Had usual childhood diseases. Had a spasm once while teething. After the war worked at several jobs. Was in Ohio State Hospital for Epilepsy for several years and at Dayton Home for Soldiers for a short time. Had malaria and dysentery in the Army. Used alcohol to excess. Had gonorrhoea at 20. Three months after his discharge from the Army he began to have nocturnal "fits" about once a month and after that they increased in frequency. Thinks malaria the cause of his trouble. Patient is

mentally irresponsible. Will steal or do petty misdemeanors unless watched.

ANATOMICAL CONSIDERATIONS

Clark thinks that some cases of epilepsy may be caused by injuries incident to birth. Birth trauma may have some such effect in a few cases but the many with history of easy birth who have the convulsive attacks have led to the abandonment of such a cause. Spratling² expressed his amazement at a lecture of Virchow's in which he showed hemorrhages of the brain into the cortical substance of such a character that they are usually overlooked macroscopically. In this connection it may be interesting that of my series Case No. 11 appeared to suffer from a rather severe form of epistaxis at about the time his seizures began. Case No. 3 had a sister who bled to death following childbirth. From this it would seem that coagulability time of the blood is a subject deserving of more attention in early epilepsy. Whether or not such hemorrhages would be followed by fibrosis or gliosis it appears that the Ammon's horn is fibrosed in many epileptics who come to autopsy and in some there is a superficial gliosis of the hemispheres. There is also noted a tendency to hydrocephalus in a few cases. More recently it appears that there is evidence for a sleep center in the midbrain which may suffer some kind of damage to produce periodic attacks of unconsciousness.

Clark³ has made the statement that in true epilepsy there is the most marked mental regression of any of the mental disorders. Stimulated by this statement and the work of Adler⁴ the writer felt that if the regression of mental life really were so marked, such cases might show here and there morphological deviations in greater number than the normal. The cases were gone over with the aim of finding as many anatomical deviations as possible and Table I gives the findings in addition to the x ray report for the sella turcica of each case. Table I and the notes with it deserve some discussion. It will readily be seen that only a part of the anomalies of development are detectable at maturity. It is highly important that detailed observations of infants and children be made in order to produce a comprehensive survey, of which Table I is only a rather small part.

In general it appears that the twenty cases present more anatomical deviations than normal people. Fifty-five per cent. of them showed an asymmetry of the head. An even higher per cent. (65 per cent.) showed high palates and Case No. 13 showed an excep-

² Epilepsy and Its Treatment, Spratling.

³ Clinical Studies in Epilepsy, Clark.

⁴ Organ Inferiority and Its Psychical Compensation, Adler.

TABLE I
ANATOMICAL DEVIATIONS AND X RAY FINDINGS OF SELLA TURCICA

[illegible]

NOTES EXPLANATORY OF TABLE I

- 1 Obese but not large.
- 1₁ Very small naevi on chest and right shoulder.
- 1₂ Very long foreskin of penis.
- 2 Very large ears.
- 2₁ Right larger than left.
- 2₂ Obese but not large. "Chunky" thick neck; head large for body; circumcised; much coarse skin back of glans penis.
- 2₃ Pointed index fingers. Penis large.
- 3 Obese.
- 3₁ Small naevus at right costal margin.
- 4 Coarse skin of hands.
- 4₁ Left nipple larger than right.
- 4₂ Obese; chunky.
- 4₃ Thick, broad hand; fingers somewhat pointed.
- 5 Double nipple on left.
- 5₁ Very narrow hips and small legs; trunk obese.
- 5₂ Small naevus in left flank; moles over body.
- 5₃ Large umbilicus.
- 6 Loose skin in front of each ear.
- 6₁ Short and worn.
- 6₂ Very large nipples.
- 6₃ Large brown mole-like area on left behind at border of ribs.
- 6₄ Stooped.
- 6₅ Hair on back. Coarse featured. Large uvula.
- 7 Large ears.
- 7₁ Peg-like teeth.
- 7₂ Very coarse skin of hands.
- 7₃ Large loose skin comes together just below glans inferiorly.
- 7₄ Large nipples. Right larger than left.
- 7₅ Very large feet. Large hands. Coarse featured. Great toes of feet unusually large.
- 7₆ Above left nipple.
- 7₇ Penis quite large.
- 8 Birth mark over sacrum quite large.
- 8₁ Stooped—pugnacious type.
- 8₂ Little finger especially pointed on right hands but all fingers have tendency to be pointed. Large uvula.
- 9 Brown spot on left flank. Small naevus on left upper border of sacrum and on right of mid-line in epigastrium.
- 10 Left nipple smaller than right.
- 10₁ Female type of pelvis.
- 11 Coarse skin about neck in irregular areas.
- 12 Stooped.
- 13 Right ala of nose smaller than left.
- 13₁ Coarse spots of skin over sacrum and gluteus maximus.
- 13₂ Small naevi on chest.
- 13₃ Little finger of each hand pointed and curved toward thumb.

- 14 Obese; chunky; large head.
- 15 Round chest; female abdomen and pelvis.
- 15₁ Very small naevi on chest.
- 15₂ Stooped.
- 15₃ Long foreskin of penis.
- 16 Very prominent eye—with tendency to exophthalmos.
- 16₁ Lept nipple lower than right.
- 16₂ Obese. Chunky.
- 16₃ Small naevi at base of neck.
- 16₄ Very large feet with large great toe.
- 17 One testicle was removed because of abscess.
- 17₁ Very obese and chunky.
- 17₂ Small naevi on chest.
- 17₃ Varicose veins of legs quite marked. This patient has a feminine face. The cleft palate and hare lip are only in tendency. One can see where the tissues of the roof of the mouth and gums barely got together.
- 18 Skin is coarse on fingers near nails.
- 18₁ Abundance of skin inferiorly just back of glans.
- 18₂ Obese and chunky.
- 18₃ Hair over sacrum. Finger nails poorly formed and junction of nails and skin seems poorly made. Pointed finger tips.
- 19 Appears brusque—more than alert.
- 19₁ Penis small.
- 20 Tendency to exophthalmos.
- 20₁ Obese.
- 20₂ Naevi on sacrum at right.

tionally high palate. No attempt was made to classify the various types of high palate. Cases Nos. 16 and 20 both present a prominent eye, reminding one of exophthalmos. These cases both present a hydrocephalic type of head and the x ray findings of the sella in both are identical. A tendency to have thick lips and a broad, flat nose was remarkably frequent. Anthropologists tell us that the broad, flat nose is the most primitive type. In 60 per cent. the frenulum linguae appeared unusually large. In some cases it was compound, as if the tongue were held down by a broad band. It was observed that these patients had difficulty in touching the hard palate with the tip of the tongue while the mouth remained open sufficiently to see the frenulum. It will be observed that this act was made more difficult in some cases by the high palate and may be an anatomical basis for speech defect, which will be discussed later. The malocclusion and deformity of the teeth observed in some cases may also bear on the speech defect. There was no case that presented a true ichthyotic skin but several showed a marked coarseness of the skin of the hands especially. Case No. 7 showed a very coarse skin

of the hands. There were no cases of hypospadias or epispadias but several showed an excess of foreskin which is the condition of the infantile penis. Case No. 17 has had one testis removed a few years ago because it became abscessed. From the conception of inferiority of organs, of Adler, this may be significant. The nipples and mammae were defective in a large per cent.

Most of the cases presented a disproportion of the body in some form or other. Several of them were surprisingly obese. The hands presented most interesting anomalies. One or more fingers of both hands in several cases were pointed at the tip and presented the characteristic hand of adolescent hypopituitarism.⁵ This was especially true of cases Nos. 2, 8, 13, 17 and 18. Cases 4 and 7 presented the hand somewhat characteristic of acromegaly.⁶ In Case No. 7 other features of acromegaly seem to be present also. There were small birthmarks on some part of the body in a majority of the cases. In two it was over the sacrum and quite large. Cases Nos. 6, 8 and 15 assume stooped postures and remind one of postures assumed in representations of primitive men.⁷

The x ray findings show some abnormality of the sella turcica in all except three cases. The abnormal types are two: those in which the fossa is encroached upon by the clinoids or bone adjacent to them, and the shallow ones. No study was made of the shoulder blades. Graves⁸ has done extensive work on this part of the body and reports an interesting type of scapula.

It was observed but not recorded in Table I that a number of the cases had larger tongues than normal.

In summarizing the anatomical aspects one must conclude that there are more deviations of development among the twenty cases than among the same number of normal people taken at random. The anomalies, in addition to being mere deviations, seem in part to be those found in dyspituitarism. There are more that possess a tendency to infantilism than toward the acromegalic type though it seems that combinations of both are present. The writer, in making close observation of pictures of epileptics in text books on mental diseases, has observed in part, at least, some of the same anatomical variations as are found in Table I. Figures 1 to 3 inclusive show the most interesting hands.

⁵ See Jelliffe and White, *Diseases of the Nervous System*, Fig. 101, pp. 212; Second Edition.

⁶ *Ibid.*, Fig. 100, p. 211.

⁷ *Ibid.*, Fig. 99, p. 210.

⁸ The Clinical Recognition of the Scaphoid type of Scapulae and Some of its Correlations, W. W. Graves, *Jl. A. M. A.*, July 2, 1910.

FIG. 1. Case No. 8. Note the pointed finger tips. The hand is quite small.

FIG. 2. Case No. 7. Note the broad, short fingers. The hand is very large.

Just as there is a certain mental and emotional character which is peculiar to the individual, so we shall find that there is a certain anatomical character, though altered by disease, nevertheless distinctive of that individual. Just as no two cases of general paresis are alike, but depend on the type of individual, so no two anatomical variants will create the same picture in their end product. This fact has necessitated the most careful judgment, and has left in some cases a feeling of uncertainty.

FIG. 3. Case No. 17. Note the pointed finger tips. The hands are small.

PHYSIOLOGICAL AND CLINICAL CONSIDERATIONS

Though it is by no means certain what diversity of function the various parts of the ductless glands have, the general trend of thought regarding them has crystallized into a sort of working hypothesis.

Of the pituitary disorders evidence is that a hyperfunction of the anterior portion after epiphyseal union has taken place creates a condition that sometimes gives enough clinical evidence to go by the name of acromegaly. Acromegaly is a disease which seems to affect either sex and comes on usually insidiously between the ages of twenty and forty. It is characterized by excessive development of hands and feet and facial features. There is often acroparaesthesia, headache, nausea, and even vomiting may occur in a few.

Mentally there may be stupor but as a rule they retain more ability than cretins. They may be exalted. One case reported by Falta and Meyers⁹ was depressed but was easily excited. Diabetes mellitus frequently accompanies the disease. A hyperfunction of the anterior portion before epiphyseal union has occurred sometimes results in the condition known clinically as gigantism. What the hypophysis has to do with the lesser giants about us that we call men of big stature has not been determined. No study has been made of the physiological or psychological qualities of cases of gigantism to know in what particulars they differ from other people.

When there is a hypofunction of the anterior portion early in life there develops what is known as Froehlich's syndrome, or dystrophia adiposogenitalis. It has also been called infantilism and the writer prefers to use that term for a reason to be made plain later. Cases of infantilism usually are very obese, though they may be emaciated; the sexual organs are very small and fail to develop. In males the testes are undescended and the penis is usually small and remains infantile in character. The skin is coarse. The hands may be well covered with adipose tissue and the finger tips are usually pointed. These patients urinate frequently. Diabetes insipidus is often associated with the condition. They eat enormous quantities of food and prefer carbohydrates. They resemble big babies, hence the term infantilism.¹⁰ Mentally they may be up to the average. They usually present a marked contrast to the stupidity of cretins. They are restless, often irritable, and may even show a gay temper. According to von Frankl Hochward¹¹ they may become psychotic.¹²

Tucker, Timme, Shaw, Munson and a number of other workers in this country have done much work on the relation of the pituitary body to epilepsy. X ray findings show often in this condition what was found in my series. Good therapeutic results have been obtained in some cases by the administration of dried pituitary. Cushing¹³ gives six reasons why hypopituitarism is related to epilepsy as follows:

1. Sir Victor Horsley noted motor cortex hyperexcitability in canines after hypophysectomies.
2. Cushing observed a tendency to epileptiform convulsions in animals kept for long period after partial hypophysectomy.

⁹ The Ductless Glandular Diseases, Falta and Meyers.

¹⁰ There are other and very different types of infantilism.

¹¹ Quoted by Falta and Meyers.

¹² The writer observed rather recently one case of infantilism, 11 years old, in whom the behavior was decidedly infantile.

¹³ The Pituitary Body and Its Disorders, Cushing.

3. Epilepsy is a frequent accompaniment of clinical conditions in which an insufficiency of the gland is manifest.

4. The pituitary body is prone to be damaged from bursting fracture of the base of the skull.

CURVE I. Record by months of the known convulsive seizures of the 20 cases, since 1903. Total, 3562.

5. It is believed the posterior lobe secretion enters the cerebrospinal fluid and thus bathes the cortex with a substance which is essential to the functional stability of the cortical cells.

6. Many individuals supposed to be suffering from so-called genuine epilepsy present symptoms of hypophyseal deficiency and in some of these hypophyseal extract has served to moderate the seizures.¹⁴

It has been observed that in dyspituitarism there is also a tendency to other ductless glandular disorders. What should be their cause, is not certain. That in my series there is evidence for ductless glandular dysfunction may be seen from the anatomical findings in not a few cases.

In order to learn more about the seizures themselves and certain other aspects of the patients' lives, several investigations were carried out. Two questionnaires were made, No. I pertaining to the seizures, and No. II to miscellaneous facts. These questionnaires follow on pp. 122 and 123. The questions were answered as best they could be in personal interview with the patient. Much of the information derived from the answers to these questionnaires will be discussed in the psychological considerations to follow. An attempt to learn the time that it takes food to pass through alimentary canal of patients gave results as found in Table II.¹⁵ Curve I,¹⁶ on p. 121, is merely an attempt to see at what time of year convulsions occur most frequently; it represents a general tendency. A discussion of part of the data collected bearing on the physiological aspects will be found worth while. It is noted that three cases had convulsions early in life. It would be interesting to know if these cases had rickets, for in this disease there is an altered calcium metabolism—a characteristic which is also present in some cases of dyspituitarism.

No. I

Questions Concerning Seizures of Epileptics

1. When did he have the first seizure?
2. As a child was he subject to convulsions or spasms?
3. What does he consider cause of seizures?
4. Description of conditions under which he had first seizure.

¹⁴ Hypopituitarism in its Relation to Epilepsy, Beverly R. Tucker, Virginia Medical Semi-Monthly, Apr. 7, '16.

¹⁵ Dr. D. C. Main reports a case of convulsive seizures in a patient with a stricture in the duodenum. Removal of the stricture brought about almost complete recovery.

¹⁶ No explanation of this curve can be offered.

5. When did second seizure come?
6. Were they regular or irregular at first?
7. Did they tend to increase or remain constant?
8. Did emotions, as anger, fright, etc., provoke attacks or make them worse?
9. Did constipation or bodily ailments make attacks more frequent or make them worse?
10. Age at which attacks began?
11. Were they mostly in day or night?
12. Were they preceded by aura?
13. Is there any pleasure about aura?
14. Is there any pleasure about attack?
15. Is there ever aura without attack?
16. Are they severe or mild?
17. Do they vary in severity?
18. Does he lose consciousness in attacks?
19. In what part of body do attacks start?
20. What part of body is affected worse?
21. Describe an attack.
22. Does confusion precede or follow attacks; give nature of same.
23. On which side does patient fall?
24. Pulse during seizure. Normal.
25. Does he perspire during an attack?
26. How long does a seizure last?
27. Does he feel badly after an attack and how long does it take him to recover?
28. Are attacks better or worse in summer?
29. Does he urinate or defecate during an attack?
30. What color is patient during an attack?
31. Are the attacks related to sex in any way?
32. What is disposition of patient between attacks?
33. What is disposition of patient just before an attack?
34. What is disposition of patient just after an attack?
35. Does he lose his speech following a seizure?
36. Is he defective in hearing or vision just after an attack?

No. II

Miscellaneous Questions

1. What treatment has he received?
2. Is he deteriorating mentally to a noticeable degree?
3. Is he normally defective in sight or hearing?
4. Does he have an unnatural appetite?
5. Does he like cheese? Does it agree with him?
6. Does he feel that he is compelled to do some things?
7. Is he hallucinated?
8. Is he delusional?
9. Does he dream; what of, and are the dreams pleasant or unpleasant?

10. Does he have any unusual abilities, as in music, art, invention?
11. Has he been subject to nightmare, sleep-walking, talking?
12. Does he sleep well?
13. Does he go to sleep quickly?

A not inconsiderable number of cases report that constipation seems to make their condition worse. The consideration of this fact, as well as calcium metabolism, will be discussed later. The aura was described as a sickly feeling in a number of cases—usually associated with the heart or stomach.¹⁷ That the attacks produce profound physiological changes may be seen from the fact that the pulse is usually greatly accelerated, and the patient usually perspires freely during or after a seizure. Many lose control of sphincters during attacks and there is usually a severe headache or malaise afterward. The face is often flushed or cyanotic and with it is in most cases a marked dyspnea during the convulsion. To those who adhere closely to the theory that there is most marked regression in seizures, it may be said that the physiological phenomena observed are those in striking evidence at birth. The writer has frequently seen Case No. 12 in an attack and the scream preceding and during the attack with dyspnea remind one of an infant newly born gasping for breath and making its first cries. By a rather crude test—the watch test—the writer felt that most of the cases were slightly defective in hearing.¹⁸ Case No. 19 suffering from olfactory hallucinations during excitement preceding the aura, could not smell oil of cinnamon. Several of the cases seemed to have an enormous appetite, and it was observed that most of these were the interesting anatomical group.

By feeding charcoal to patients at meal time, it was possible to get the data of Table II. The time for food to appear at the rectum after ingestion in no case falls out of normal limits. The time that was required for the colored food to be entirely eliminated is rather long in several cases. Some writers have considered deficient alimentation as a cause of epilepsy. What place stasis may have will be discussed under chemical considerations. Likewise deficient calcium of the blood¹⁹ and increased intracranial pressure²⁰ will be given consideration not as causes but as factors in the physiological mechanisms predisposing to convulsive seizures.

The speech of epileptics seems characteristic. A defect was found in most of the series. Case No. 10 was a stammerer before the attacks began. As has been pointed out, there are high palates,

¹⁷ May have some relation to Kempf's theory of autonomic tensions.

¹⁸ The writer hopes to investigate color vision later.

TABLE II

Case No.	Hrs. from Ingestion of Charcoal Until it Appears in Feces	Hrs. from 1st Appearance of Charcoal in Feces Until it Ceases to Appear
I	21.	21.
5	36.75	24.75
6	37.	
7	24.	
9	24.	9.
11	21.5	44 plus
12	24.5	47.5
15	17.	51.5
16	31.5	
19	46.	
20	28.	40.
Normal—X-Ray	36.	12.

thick tongues and tongues with restricting frenuli among the series. The speech defect is a sort of repetition of a word or phrase here and there. The writer prefers to represent it by a series of overlapping lines, thus:

A.....

B

The stream of talk is not continuous but overlapping. One writer has likened it to stereotypy; in fact, he called it a stereotypy of speech.²¹ This is a type of speech that one frequently finds in children.

Before coming to some theoretical considerations of diet and the chemistry thereof it may be well to summarize the physiological aspects of our cases. They are unstable and undergo profound changes within short intervals. As regards food and comfort they are in many respects infantile and in their periodic reactions there are evidences that they are characteristically infantile as well as adult. The infantilism may not be constant but may appear at irregular intervals and makes a most motley and incongruous character.

THEORIES REGARDING THE EFFECT OF CERTAIN FOODS ON EPILEPTICS

It has been an observation of some standing, though not so reported by a majority of my series, that cheese used as a diet for epi-

¹⁹ The Use of Calcium in the Treatment of Epilepsy; John Bryant, Boston Med. and Surg. Jr., Oct. 7, 1915.

²⁰ The Treatment of Epilepsy, Israel Bram, N. Y. Med. Jr., Nov. 20, 1915.

²¹ Palinphrasia in Epilepsy with a Report of Cases, L. F. Robinson, Jr. of Med. Soc. of N. J., 1915.

leptics increases the frequency and severity of convulsive seizures. Aside from the mechanical conditions which it creates in the bowel, the chemistry of cheese is deserving of consideration. Table III gives the per cent. of the two proteins found in human and cow's milk; also the total protein of both.²²

TABLE III

	Human Milk	Cow's Milk
Casein	.5-1.5%	3 -4.0%
Lactalbumin	.1- .3%	.3- .4%
Total Protein	.7-1.5%	2.5-4.0%

It will be seen from this table that most of the protein of milk is casein. Cheese contains some fats but is largely casein. If one is liberal and estimates the casein at 4 per cent., it requires 25. + ounces of milk to produce an ounce of cheese which is often eaten at a meal. Casein is a unique protein in certain respects. It contains very much of three important amino-acids, viz., histidine, tyrosine, and tryptophane. There are other foods that contain one of these amino-acids in considerable quantity but there is no food thus far studied that contains the three amino-acids in such quantities. Table IV gives the per cent. of each amino-acid in cow casein.²³

TABLE IV

	Tyrosine	Histidine	Tryptophane
Cow's casein	4.5%	2.59%	1.5%

The importance of the above-mentioned amino-acids has been emphasized in recent years as a result of the great interest in the endocrine organs. Tyrosine (B-parahydroxyphenyl, α amino propionic acid) has the following formula:—

Histidin. *Histamin.*

²² From Mathews' Physiological Chemistry.

Hart, Zeit. physiol. Chem., 33 (1902).

Morner, Zeit. physiol. Chem., 34 (1902).

Osborn and Guest, Jr. Biol. Chem., 9, 333 (1911).

²³ Abderhalden, Zeit. physiol. Chem., 44, 23 (1905).

along with the formula of adrenaline. It has been theorized that because of the close relationship which exists in the formulae of these two substances that probably the tyrosine which is recovered in the end stage of protein digestion is utilized somehow by the body in the manufacture of adrenaline.

Histidine, also an end product in protein digestion, has the following formula:

Tryptophane.

By the removal of the CO_2 from histidine, a toxic substance, histamine, is produced:

Thyroxine.

Abel contends that histamine and pituitrin are identical substances. The pharmacology of each is so very similar to the other that they must be closely related substances. A bacillus called *B. aminophilus*²⁴ has been isolated from the intestinal tract of man which has the ability to decarboxylize histidine and produce the toxic histamine. Some workers²⁵ have advanced the view that histamine may be the cause for dementia praecox. It seems quite probable that the body may utilize histidine in the manufacture of the active principle of the posterior portion of the pituitary body. It can be seen that under some conditions intestinal stasis may produce an excess of a pituitrin-like substance.

Tryptophane, another end-product of protein digestion, has the following formula:

²⁴ Chemical Abstract, Vol. VI, p. 3443; Vol. VII, p. 626.

Adrenalin.

By the recent work of Kendall²⁶ at the Mayo Foundation, the active principle of the thyroid gland has been isolated and for it he gives the following formula:

Tyrosine.

This substance, thyroxin, it will be observed bears a striking resemblance to tryptophane. It has been spoken of as an iodized tryptophane. It also seems quite probable that tryptophane is utilized by the body in the production of the active substance of the thyroid gland.

Adrenalin is the most powerful vasoconstrictor in existence. Cannon²⁷ has shown that this substance is released in considerable quantities in anger, pain, fear, and rage. It constricts the abdominal vessels and causes the blood to be forced into the limbs and head. It releases sugar from the liver. It increases the coagulability of the blood. It increases the efficiency of the musculature. Cannon speculates that it creates the most favorable physiological condition for dealing with the excitant of the emotions—to engage in flight or fight.

²⁶ Chemical Abstracts, Oct., 1919.

²⁷ Bodily Changes in Hunger, Pain, Fear and Rage, Cannon.

Pituitrin is a substance which is thought to have some function in parturition. It increases blood pressure by a different mechanism from that of adrenalin. It is a powerfully active substance and causes smooth muscle to contract.

Thyroxin produces, when given in sufficient dosage, all the cardinal symptoms of toxic goitre, viz., tachycardia, nervousness, increased blood pressure, and increased basal metabolism and vasomotor disturbances. The details of the pharmacology of this substance are not yet worked out.

These three substances, which are all very powerful in their action on the circulation, are probably produced from the amino-acids found most abundantly in casein of cheese. Thyroxin in its action disperses energy rather uniformly over the body by the tremors and increased metabolic rate. Adrenalin has been known to produce unconsciousness when injected in large doses. These substances all disturb in one way or another the vasomotor system which is said to be the causative agent in ordinary fainting spells. Epileptic convulsions may resemble a fainting spell or be very different from it.

A further study of the effect of diet on man has been noted by Mercier.²⁸ He observed that certain patients who used little meat and much fat either in the form of butter or fat meat, complained of nervousness and depression. Upon reducing the fats and eating some lean meat, the nervousness and depression disappeared.

The physiology and chemistry of this process may be worthy of analysis. Fats are retained in the stomach longer than other foods. They coat over, so to speak, other particles of food and make them impervious to the digestive juices. Retention of fatty foods in the stomach a long time permits fermentation to take place in some instances. The result is an acute gastritis, and often nausea and vomiting. Fats once in the intestine are split into glycerine and fatty acids. In these forms fats are soluble and those that are taken up by the blood stream or lacteals are carried away. But before the fatty acids are carried away, an important and insidious chemical change is likely to take place. Fatty acids, such as oleic and stearic, unite readily with calcium to produce insoluble salts. (The flakes formed when one uses soap in "hard" water, is an example of the insoluble calcium salts.) In this way, the body gradually becomes decalcified to the point of irritability (nervous-

²⁵ C. Ceri, *Cerebral Concussion—Dementia Praecox* Studies, July, 1918.

²⁸ *Dementia Praecox* Studies, Mercier; July, 1918.

ness). Infants fed a fat, rich milk become irritable and tend toward spasmodophilia. Calcium seems to reduce the irritability—to quiet.²⁹

PSYCHOLOGICAL CONSIDERATIONS

From a reconsideration of the answers to questionnaires Nos. I and II, some facts bearing on the psychological nature of the cases are revealed. Causes for the convulsions were given as falls and injuries, sunstroke, disease, over-work at mental tasks, masturbation and sexual overindulgence. In some cases the first seizure occurred under very obviously painful mental situations. In others there seemed to be no relation of this kind. In some the seizures were regular and in others irregular. Most thought that emotional conditions made attacks worse. One patient, No. 13, said that an erection of the penis would bring on a seizure. It is strange that many of the attacks occur at night. Dreams might explain the attacks if one were to attribute them to some psychic origin. In most cases there is an aura and strange to say a few patients frankly stated that the aura is pleasurable and that even the attack itself would not be bad if not followed by the malaise. Case No. 1 enjoys the attack usually and does not feel badly afterward. Many of the cases have the aura without the attack. One patient who has such experiences thinks that this is *prima facie* evidence that he has control at those times of his disease. It is to be wondered if there are not many people who possess the epileptic character who never have more than the aura. Attacks seem to vary much in severity in most cases. For the most part the patients have grand mal seizures. In Case No. 9 with a positive Wassermann, the patient is given no warning in the form of aura and says that the attack is as if a shot had struck him. Patients are confused after attacks usually for some time and in some instances before. A few patients declared that the attack reminded them somewhat of a sexual experience.

An effort was made to collect those experiences which might be considered nearest the so-called archaic type of reaction. Case No. 15 reports that following some attacks he has seen a rainbow colored cross. Case No. 4, if he has a seizure in daytime, prefers to go to the dark to have it. Case No. 19 has olfactory hallucinations before and following seizures. These characteristics of Cases

²⁹ Esquimos, who consume much fat, live a very short life. Oxalic acid which produces an insoluble calcium oxalate when taken into the body produces, in its toxic effects, tetany and a spasmodic death.

Nos. 4 and 19 are evidences of regression to an early level. Several stated that at times they felt moved by some compulsive force and were not responsible for what they did. Many of them are hallucinated and delusional part of the time. The delusions tend to be of a religious variety and to some the vision and voice of God appear occasionally. This is evidence of a regression to the childish ideas of God. Most of the patients experience dreams usually of a pleasant character. The scenes of the dreams are often of childhood and may be said to be wish-fulfillment dreams. The sleep of patients is usually sound and after retiring they go to sleep quickly.

It was desired to see if evidence could be collected which would show the tendency of epileptics to regress. Each night for four nights the twenty patients were observed at various parts of the night to see what position they assumed in sleeping. Table V on p. 132 shows the result of the observations on the twenty cases as well as the statement of 44 normal people as to how they lie, for the most part, in their sleep.

Karl Braun in his account of over 45,000 obstetrical cases concluded that the left occipit anterior position occurred in 70 per cent. of the cases before delivery. In a pendulous abdomen it will be observed that in this position the right side of the foetus, due to the force of gravity, comes most in contact with the mother and should probably receive most stimulation: or at least, the stimulation of the right side of the foetus is the latest prenatal stimulation in 70 per cent. of the cases. It was thought that if the regression be a really great factor, that in sleep, epileptics would have more tendency to lie on the parts stimulated most in intrauterine life than normal people. The regression of sleep seems to be to an intrauterine posture or attitude, rather than to the position which receives the most stimuli in utero and it is more marked in epileptics than in normal people, if we are to place our reliance on data of Table V.

Clark gives in one of his cases, a classical example of psychological regression following an attack in a patient; earlier in life this patient had been a student of two German teachers, one of whom he did not like. In some attempt to talk after a seizure, he suddenly began to speak German.

Kempf³⁰ thinks that the seizure is frequently the manifestation of an anal-rectal eroticism, as it were, and quotes cases which he has to support his psychoanalytic theory. In further support of this theory is the bad effect of sedatives in many cases of epilepsy, which prevent the attack but do not permit the outlet of energy which Kempf would say was so essential to the adjustment of the cravings.

TABLE V

		Case No.																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
January 3 and 4:	9-11 P.M.	R	R _x	R _x	B	R	R	R _x	R	R	B	L _x	R _x	L _x	R	R _x	L _x	R	L	L _x	L
	11-1 A.M.	L	B	B	R _x	B	B	R	B	R	L	B	L	B	R	R _x	R	L	L _x	L _x	R
January 4 and 5:	2-4 A.M.	R	L _x	B	R	B	B	B	L	L	B	R	B _x	L _x	R	R _x	R	R _x	B _x	R	R
	9-11 P.M.	R _x	B _x	R	B	L	B	R _x	B	R	B _x	R	B	L _x	S	R _x	R	R _x	B _x	R	R
January 5 and 6:	11-1 A.M.	L	R	L	L _x	B	B	L	L	R	L	R	L	L	S	R _x	R	R _x	B _x	R	R
	2-4 A.M.	B	B	B _x	L	B	L _x	R _x	B	R	R	R	L _x	L	R _x	R _x	L _x	R _x	B _x	L	R _x
January 5 and 6:	9-11 P.M.	L	L _x	R	B	B	B	R _x	B	L	R _x	B	R _x	R	R _x	R _x	L _x	R _x	B _x	L	R _x
	11-1 A.M.	B	B	B	L	B	B	R _x	B	R	R _x	B	B	R	S	L _x	R	R _x	L	R	R _x
January 6 and 7:	2-4 A.M.	L	L _x	R	B	L	B	L	B	R	B	R	R	R	L _x	L _x	R	B	L	R	B
	9-11 P.M.	B	B	R	R _x	B	B	R	B	R	L	R	R	B	R	L _x	B	R	R	R	B
January 6 and 7:	11-1 A.M.	L	B	R	B	L	B	L	B	R	R	R	R	B	L _x	L _x	R	R	R	R	B
	2-4 A.M.	L	B	B	R _x	B	L	R _x	L	B	L	B	R	B	L _x	L _x	R	R	R	L	B
																		Per Cent.			
R—On right side straight.																		R—52.4.			
L—On left side straight.																		L—18.1.			
B—On back straight.																		B—11.3.			
R _x —On right side and drawn up.																		Normal,			
L _x —On left side and drawn up.																		44 cases.			
B _x —On back and drawn up.																		L _x —6.9.			
S—On stomach.																		B _x —0.			
																		S—0.			

R—On right side straight.
 L—On left side straight.
 B—On back straight.
 R_x—On right side and drawn up.
 L_x—On left side and drawn up.
 B_x—On back and drawn up.
 S—On stomach.

Per Cent.
 { R—29—.
 L—15+.
 B—27+.
 R_x—13+.
 L_x—11—.
 B_x—3—.
 S—2—.

Per Cent.
 { R—52.4.
 L—18.1.
 B—11.3.
 R_x—11.3.
 L_x—6.9.
 B_x—0.
 S—0.

Epileptic,
 239 observations
 on 20 cases.

The study of regression³¹ is an unexplored field among the psychotic as well as among normal people. Few unfold until their death. Most of us at fifty or thereabouts begin to retreat into the good old past. The methods of the regression, the character of it, and its suddenness and irregularity, or the early age at which it may begin, may be as varied as the statures or the intellectual differences of men. Atavism is a biological reality gross enough only occasionally that it assumes distinctive proportions, but there is a vestige of it in most of us could we but train our eyes to see it.

That in epilepsy there is frequently great evidence for regression, no one would question. It is present in other psychoses as well but in epilepsy it is characteristic in that it is more irregular and is most marked at the convulsion. Anatomically, there is frequently among epileptics a tendency to infantilism and sometimes to acromegaly. Physiologically there is a marked instability, especially at the time of the convulsion. Assuming the truth of these statements, the writer feels that the psychological tendency to regression, whether in an attack or at other times, is only one of the manifestations of the tendency to infantilism existing in the epileptic. In other words, if there is an anatomical and a physiological, there is often a psychological infantilism as well.

Epileptics frequently show unusual abilities. Two of my series are quite good artists. These were the most poorly adapted of all to make social adjustments. Pressey and Cole³² in examining patients who had deteriorated, as well as feeble-minded, came to the conclusion that when feeble-minded are tested their failures in the scale are rather abrupt and short, while patients who have deteriorated, scatter promiscuously in their achievement against a scale of increasing difficulty. Epileptics with evident inferiorities must cultivate those few intellectual qualities which they possess, to a high degree, in their struggle to compensate. Napoleon and Caesar and

³⁰ Psychopathology, Kempf.

³¹ The writer is convinced that the only way to study epilepsy or any such disease entity is comparatively. For example, epilepsy has something in common with the other psychoses yet it is different. Since it has an altered calcium metabolism it should be studied with rickets, scurvy, and some of the dyspituitarisms. The convulsive types of diseases as eclampsia, uremia, general paresis, hysteria, spasmophilia, tetany, and diseases of this class should be compared. Phylogenetics might give us some insight. The common opossum (*Didelphis virginiana*) when captured in its wild state assumes an unconscious attitude. The writer has heard of two dogs that had convulsive seizures. Clark reports a canary with an epileptic condition. Rhinophora and many common beetles fall as if dead when touched. Physiologically the convulsion may be looked upon as a massive reflex akin to shivering or tremor of fear or anger. In addition, there are the many types of epilepsy itself and epileptic equivalents.

well-known men of culture of our time are examples in point. But the gross reactions of these men are usually as strong as their weakest trait.

It might be well to consider some of the conditions under which one of the cases began to have his seizures, by going into some detail in his history.³²

The mother had paralysis and aphasia seven years before death, much of which disappeared. The father had pneumonia at 28 and rheumatism at 72. It is said that the father had a convulsion when he had pneumonia, but this is not certain. A sister of the mother went insane when compelled to face the exile of her children.

The patient had smallpox at two, at which time he began to talk in a stuttering way. Went to the elementary school at eight and scientific school at ten, but because he failed in an examination, left school. Took a position as a clerk which he held two years. At eighteen he came to Chicago where his father and brothers were; worked as a laborer for a time and attended night school. After eight months he was appointed teacher of English to some foreign pupils. He took a course in high school and entered the University of Chicago in 1893 with a scholarship for having passed the highest entrance examination. During his college life he continued to teach in the night school. He was graduated in 1897, having specialized in science and modern languages. During the last year of his university life the patient started a fire in a stove, poured too much kerosene on the fire and an explosion occurred. He ran across the street to his sister, took off his coat, lay down on a bed, and had a convulsion resembling those he had subsequently. There was no outcry and apparently no aura except a feeling of illness.

The patient fell in love with a girl and wrote verses to her. Eight months later he was told by his brother that he had epilepsy and should never marry. The girl was told of his affliction and gradually withdrew from his company. Later, on a lake trip, he had the second convulsion. The patient called this sea-sickness. Following this he began to read books on epilepsy and mental diseases and took several forms of bromide salts. While waiting for an appointment from Washington he went to a city, D——, to take an examination for the position of high school teacher. He had some differences with the authorities about the position. That night in order to pass the time he went to a theatre and while in the

³² Irregularity in a Psychological Examination as a Measure of Mental Deterioration, S. L. Pressey and Luella W. Cole, Jr. of *Abnormal Psychology*, Dec., 1918.

³³ "Few observers have been able to withstand the temptation to 'elaborate the obvious'—in this case to study and re-study convulsive phenomena. This tendency is all the more noteworthy as practically all authorities agree in these statements: that true epilepsy can occur without convulsions; that the convulsions may be simulated by those of other diseases; that the mental state between convulsions is as typical of epilepsy as are convulsive seizures."—Quoted from "A Clinical Study of Epileptic Deterioration," *Psy. Bul.*, Vol. IX, John T. MacCurdy.

gallery felt an uncontrollable impulse to jump from it. He went to his hotel and thinks he had several convulsions there.

Within a short time he came to Washington to be employed in a very special capacity because of his knowledge of languages. He recorded in his diary the seizures each year until his admission to the hospital. In 1901 the girl with whom he was in love died and in

CASE No. 7. V. J. (The ones not accounted for must have died in infancy.)

this year he ceased the use of bromides. The next year he sent the brother of his sweetheart to school and paid his way but the boy did not honor his opportunity and discontinued school. In 1903 he wrote many newspaper articles, especially on science. In 1904 he

received from a physician the suggestion that he had a tapeworm and was treated for it. Was operated for hemorrhoids the same year. During this year he received a promotion and discontinued the use of salt from his diet. The next year he was demoted. It is interesting to note that just preceding his demotion he had more convulsions than he had experienced in any year of those recorded in his diary. Whether the impending demotion was the cause or effect is hard to say. He began the use of bromides again. In 1906 he translated an idealistic, mystical metaphysical poem which seemed to have much influence on him. He began to infer that his mother had diabetes and spent much time with her.³⁴

In February, 1909, his mother died and he thought the mother of his dead sweetheart came wherever he was. In June, 1909, he discontinued bromides. Slept in open air. Patient noticed that convulsions came at about the time of nocturnal emissions and a physician whom he consulted told him to visit a prostitute. He followed his suggestion but had no erection at first visit. On second visit he had an erection but no ejaculation. Patient became apprehensive after this but was persuaded again to have hetero-sexual relations and claims to have had normal relations. He discontinued foods without salt.

On July 5, 1909, the patient had convulsions following the escape of gas in his room; on July 7 had another; on July 8 had eight, and four the following morning. He ceased to pass urine and feces and was delirious for 5 days during which time he imagined himself to be Satan and that he had raped his sister. He saw his mother as a little girl and another of his relatives appeared as a little boy. Claimed he could see through the walls, saw maps of Europe on the ceiling, etc. He had to be catheterized and the feces taken from him. He was told by a physician that there was nothing wrong with him and in two days he was back to work. He gained 10 pounds in weight and wanted to marry. Ten days later had headache. He was reprimanded by his brother-in-law for something he had done wrongly, got excited, and had a sleepless night with convulsive attacks during the night. Returned home from work a short time after this, stating that he had foolish thoughts and did not care to show his condition to strangers. A month later he started a fire in the bathroom with paper and inflammable substances and called "Burn the house." He was admitted to the hospital the next day. He talked about inventions, plans to free the Poles, poetic ability, and would give a mystical turn to his conversation. He washed his hands many times for a number of days. From this point an irregular account of his history containing only special features will be given.

After a visit by a brother-in-law who criticised him severely for his inventive ideas, he became excited and dizzy; says that he may even have been unconscious. He thinks his dizziness due to the fact that he could not defecate as much as possible.

³⁴ When he was well established he had his family—father, mother and sister, come to where he was employed that he might have a home.

In his own words is the history of his early religious life. "As a child I was brought up in the Catholic faith. Up to 13 years of age I was very devotional, most religious of the family. My brother was attending the Gymnasium and brought home a Polish translation of Büchners *Kraft Und Stoff* (materialistic philosophy of energy and matter). I read the book and thought I was an atheist and dropped all forms of devotion. Legally I had to be a member of the Catholic church and study Catholic religion in school but I did not have to attend church services. I kept up such views until about my first year of college, or about the 21st year of my life. As an atheist I would many times get in some small discussion with older people who used to treat my views in a humorous way and would express their sorrow and regret. My change from atheist to the faith of immortality occurred with an incident which I shall describe. I studied science, had prepared for such partly by self study of botany and physics. One time during laboratory work I looked through the microscope on a drop of water containing infusoria. A thought came to me suddenly and I spoke 'That could not be without God!' Since then I ceased to be atheist. I understand only Life and consequently believe in the Highest Lord of Life. Death is nothing to me except a part of life."

He knew nothing about sexual matters until 13 (the same year that he changed so profoundly his religious views). At that age he masturbated, was warned by a relative, and stopped for a time. Between 14 and 20 he often thought of going to women but thought that to be a very bad thing, for he thought women the equals of men and that to have sex relations with them would not be treating them as such. A further account of his sexual history shows it to be abnormal. A statement as to how he understood sexual matters after his admission to the hospital sounds to one like the statements of a child—an element of mystery pervaded the whole idea and one gets the idea of his leanings toward homosexuality.

In an attempt at free association, the number 1323 was given to him by the examiner. He said that the 13 brought to mind the algebra problem in an examination, which problem he did not know. The 23 reminded him that in his 23d year he became acquainted with his girl. The 13 again reminded him that in that year he was informed about sexuality.

Patient on several occasions talked about getting married and on mentioning the inadvisability of same he had petit mal seizures during which time he would speak Russian. He presented many wish fulfillment phantasies and bizarre ideas from time to time.

During a convulsive seizure it was observed that in the right eye there was hippus. The eye blinked and then there were convulsive movements of the right side of the face. He tried to talk but could only produce a blowing noise. The trunk stiffened and patient turned over in bed. The hand and arm on right side were thrown in convulsive movements. The patient then flexed and extended all the extremities except the left leg. There appeared a movement of the eyes resembling nystagmus. Foam, blood-tinged, appeared at the

mouth. The patient went into a deep sleep with stertorous breathing.

In summarizing the case it is rather significant that the mother had diabetes and that the family shows ample neurotic determinants to account for the inferiority of the patient. He showed an inferior speech mechanism very early and became a linguist according to the theory of Adler for no other reason than Demosthenes became an orator. His instability is shown by a failure in an examination in *realschule* and a scholarship for passing the highest entrance examination in the University of Chicago. The fact that he was over-devotional and knew nothing about sex until 13, at which age he began to masturbate and changed profoundly his religious views, is significant of an abnormal—a floundering sex development. The incident of his first convulsion is decidedly a psychic explosion to compensate for an otherwise inferior equipment to meet the emergency. The diagnosis of the disease after an attempted courtship branded him so far as society was concerned among the unmarrieds and thus caused him to react in a new and almost mysterious world so far as his own biological cravings were concerned. When he was said to have been suffering from tape-worm and hemorrhoids, it was most likely an anal erotic manifestation, and surgical intervention had no effect. We are led to believe that he was very devoted to his mother. What influence she had over him is not certain, but following her death a sort of compensatory mechanism in the form of hallucinations portraying his dead sweetheart's mother appeared. Another anal erotic defensive crisis occurred in his 5-day delirious episode when he passed no urine or feces. When the real motive of his cravings entered consciousness the incestuousness of them in the light of his religious and home training, on top of a biological inferiority, placed him in the category of the most despised—Satan. The quick recovery from this condition shows the adjustment of tensions. His free association is very active about incidents which aroused his aversion in previous years. There are many more things in the life of this patient which have interesting psycho-analytic interpretations.

The patient is biologically inferior, in the light of the vital force that creates progeny and progresses, rather than regresses. To psychoanalyze him is only to measure his biological decompensation, which is his particular psychosis. It happens that those who have behaved much like him have been called epileptics. Those who act a bit differently are given the name *dementia praecox*, manic depressives, etc.

Mr. A. meets a distasteful obstacle by cursing. This relieves certain tensions and strains and affords an outlet of energy to readjust the organism. Mr. B. is built differently, and in such a situation as Mr. A. has faced, he takes refuge in sudden unconsciousness—a sort of massive reflex—and lets the tensions readjust in the tonicities and clonicities which follow. Mr. C., with a totally different makeup, also takes refuge in unconsciousness, but slowly. His tensions are released slowly. He may end in a profound

stupor³⁵ and were he not built this way, he might have to resort to narcotics or alcohol to dissociate himself from the traumatizing situation.

SUMMARY

1. There are among epileptics more anatomical deviations than among normal people.

2. These are:

(a) Simple morphological deviations.

(b) Evidences of dyspituitarism.

3. The changes in anatomical character are as much dependent upon the original anatomical character as a psychosis is upon the original mental make-up of an individual.

4. Physiologically there is in epileptics a profound change during and after convulsions.

5. Many of these changes remind one of infantile physiological phenomena.

6. The chemistry of certain foods, the vascular phenomena of epileptics and their endocrine disturbances suggest not a cause but sensitizing agents which tend to ignite the reaction of the organism whose threshold of mass reflex action is low.

7. Psychologically, epileptics show at certain times marked regressions, instability, restlessness, inadaptability and egocentricity, with lowered emotional tone.

8. They tend to regress in their sleep more than normal people as shown by their postures and dreams.

9. There are evidences that the regression is the psychological manifestation of infantilism which is latent or demonstrable anatomically.

10. Epilepsy is the particular way that a person has of behaving in the presence of real or imaginary situations. The individual is biologically inferior. He may compensate for some of this inferiority by unusual abilities. His inferiority, whether from pituitary disorder or other origin, nevertheless exists and concomitant with it are certain physiological conditions which represent the epitome of a tendency to act in a mass reflex.

11. On the assumption that epileptics are biologically inferior we should not throw up our hands as a fatalist would do, but strive by our studies in anatomy, physiology, chemistry, pharmacology, and psychology to meet them half way,—build what barriers we can around their weakest traits.

³⁵ Priests in India cultivate the ability to withdraw from reality in their method of devotion and from descriptions of them their condition must be very near to that of catatonic stupor.

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