one other case, one which occurred many years ago, which presented the same diagnostic problem.

DR. RALPH REED, Cincinnati: It is important to remember that there may be an exhaustion of psychogenetic origin. I readily concede that many of the psychoses are of toxic origin and also many of the neuroses, but I believe that there is a complaint of exhaustion which is nothing but an expression of dislike for the particular work the patient is doing. It is an evidence of inhibition rather than a true exhaustion. Work can be a pleasure or a pain, depending on how much we love it or hate it. Work in which some deeply disagreeable emotional factor is involved is always distasteful. An inclination toward its abandonment under the plea of exhaustion, the plea of working too hard, etc., is thus in some cases merely a rationalization of distaste for that particular work. A year ago a young man who was working for his father in a large mill came to me. He could not work two hours without becoming intensely exhausted, but it was curious to note that this exhaustion was not so great that he could not pace the office almost every minute he was there. Therefore, his exhaustion was a rationalization of his really unconscious distaste for his work. When certain depressing factors due to unconscious antagonism toward his father were removed, the exhaustion disappeared, and he is now able to work eight hours a day. But if there happens to be a slight renewal of that antagonism between father and son, he again comes to me with his complaint that the work tires him.

DR. MEYER SOLOMON, Chicago: The trouble with Dr. Reed's patient was not really an exhaustion; he simply acted as if exhausted. That is one of the problems we have to consider when we discuss the effects of the mind or the body. Ideas, attitudes on the part of the patient, cannot bring about disturbances of the sort discussed by Dr. Norbury. An idea may lead to a transient reaction of the voluntary nervous system, but when you get phenomena of real exhaustion related to some part of the nervous system, whether of the voluntary or of the vegetative nervous system, the symptoms are due to something else. We may look on the effects of shock, emotion, etc., in the following way: If we view the development of the mind and nervous system from the highest functions down we find that the highest function is critical consciousness; then comes observing or passive consciousness, then the ideational phenomena, then the locomotor and postural phenomena, next the vegetative reactions, and, finally lowest are the physico-chemical reactions. Shock, emotion, trauma, etc., may cause a disturbance anywhere along the line, in the same way that a toxemia, an infection, or what not, may bring about the same sort of disturbance. But the disturbance you see is a physiologic disturbance, due to a reaction on the part of the nervous system or of some one or several of the organs, and the treatment is not only psychologic but physiologic also.

Let us take an illustration: An individual begins to worry about something that has occurred and he develops insomnia. As a result of the insomnia he develops headache, asthenia, loss of appetite, loss of weight, etc. The symptoms he has are real symptoms due to fatigue, to exhaustion. You are not going to convince the patient that he has not real symptoms, because they are real to him. The treatment is relief of the symptoms, physiologically or by drugs, plus an explanation to the patient of the origin of the end-results that he presents. The symptoms he has are true phenomena, just the same as in shell shock cases.

The psychogenetic viewpoint is interesting, but we should not be swept away by the idea that hypnosis, or "unconscious thought," can, in a peculiar way, disturb permanently the involuntary or voluntary nervous system. They are really physiologic reactions and the treatment should be not only psychologic but physiologic also.

DR. C. K. WOONSON, St. Joseph, Mo.: Loading beyond the carrying, resisting capacity interferes with function. The man or woman who tries to work sixteen hours a day, or who assumes work when not well, or when not properly nourished, interferes with carrying or resisting capacity. Toxic conditions favor the lowering of resistance, and this, in turn, favors the production of a toxic condition. The individual who takes good care of himself, who works reasonably well, who takes

sufficient exercise, who takes sufficient rest, can carry much better than the one who assumes to work sixteen hours a day and has insufficient sleep, and who worries. Toxins interfere materially with the functions, whether the results be a mental depression or a manic depressive form of insanity does not matter. The same results will come from the same causes, or the same causes will produce the same results. The individual who is not eliminating properly is not in normal condition; the man who is eliminating with a purgative is not in normal condition. In fact, almost all these patients are run down; they are below the standard weight; they have a tired feeling; they think slowly; they do not want to do much; they are confused, bewildered. And if we follow these cases through we find that when they improve in health, it is because they are beginning to sleep and eat well, after which they improve right along under ordinary circumstances.

DR. FRANK P. NORBURY, Jacksonville, Ill.: With reference to Dr. Reed's point as to a psychogenetic basis, I think the individual is endeavoring to dominate his environment whether you approach his problem from a psychogenetic or a physical point of view. The individual has to live, and it is the living he is endeavoring to elicit. Life is a struggle; and he has to make arrangements to survive. That is the point we have to consider. The associations through the man are explained also, and as such they explain the physical disintegration, if you wish to call it that, and all the factors that go with it. We are dealing with a state of exhaustion, confusional states, including confusion in the perceptive functions. All the faculties are thus in a state of confusion; this confusion reflects itself in disturbances which have to do with the general physical condition of the patient.

SOME SUGGESTIONS FOR MORE ACCURATE MENTAL THERAPY IN EPILEPSY*

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Until a few years ago epilepsy was largely diagnosed by exclusion. After a complete medical and neurologic examination of a person who had fits, and in the absence of any marked evidence of any physical or mental disorder, he was called an essential or idiopathic epileptic. He practically had an enduring disease without any discoverable cause for it. Of late, a number of investigators have undertaken to study the whole subject anew, not alone from the physical, but also from the psychologic point of view. As a result of these studies, we believe a considerable advance in our knowledge of the subject has been made. For instance, we have analyzed the make-up of the essential epileptic as an individual, to discover, if possible, whether he constitutes a particular type. We have also studied the fit in the light of a biologic reaction and endeavored to analyze the fit as a part or a further elaboration of such an individual's peculiar make-up. In other words, given a certain potential constitution plus a special type of stress applied to it, we gain a certain psychologic effect which we have called the epileptic reaction. In many instances, the ultimate reaction is what is commonly called a convulsive fit. We may, therefore, consider briefly today, first, the constitution or make-up of the essential epileptic, second, the epileptic reaction, and third, sketch the main suggestions for a mental therapy based on such a rationalization of this great disorder. In passing, permit me to state that all

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the physical disorders including the late studies of endocrinic disturbances are not dwelt on here, not because they are unimportant but because an exact mental approach in the therapy of this disease has in the past been so neglected, or has been handled in a haphazard and empiric manner.

The epileptic constitution, or make-up, has long been recognized as the enduring mental stigma of essential epilepsy itself. Only recently have studies disclosed that the main tenets of such a character are present years before the nervous disorder of epilepsy is shown in fits. Indeed, most frequently some part of these defects of personality may be detected in earliest childhood. The chief instinctive defects of the potentially epileptic individual are egocentricity, supersensitiveness and emotional poverty. The potential epileptic is intensively self-centered and fails to project his life interests into his environment in a normal and healthful manner. Partly because of this innate character fault, he is or soon becomes unduly sensitized to all forms of extra stress and annoying demands. He either extroverts his supersensitiveness by exhibitions of rage and tantrums beyond those which may be seen occasionally in passionate children, or, he introverts this feeling and represses the feelings engendered by his environmental conflicts, causing him to develop a very unstable, irritable and sensitive emotional life. This emotional state paves the way for larger and more difficult adaptations which he cannot meet; outspoken fits may then occur. By possessing an egocentric and supersensitive make-up, the potential epileptic fails to make the degree of environmental contact which would lead him into a broad and rich experience with life, hence sooner or later he fails to acquire a well rounded emotional development. This deficit may or may not limit the individual's purely intellectual equipment in later life. Previously endowed with these defective instincts, the increased demands of adolescence and adult life enlarge the difficulties which such individuals are compelled to meet until they reach the breaking point in a fit or seizure. A disintegration of habits and character, known as deterioration, occurs more easily in one thus handicapped by a defective endowment. Therefore, mental or behavior deterioration often precedes actual epileptic seizures for a considerable time. The primary defective endowment plus its easy deterioration accounts for the fact that an essential epileptic from the very nature of his make-up is usually doomed to mental failure, if proper measures to check or controvert his innate faults are not taken at the earliest possible moment. Any effective plan of treatment must essentially take strict and early account of the make-up of epileptics, before all else.

It has been commonly held that even after the first grand mal fit, the epileptic disorder is already a chronic one and only too often defies any and all forms of treatment. This view is true and understandable in the light of what we have just considered. We can only profit by it in the future by steadily educating parents and relatives to recognize the earlier and more benign presence of epileptic reactions such as lethargies, twilight states of petit mal, pathologic absentmindedness, crass rages and tantrums, and the like excessive morbid emotional states. It is now obvious to the careful observer that the fit itself is a reaction away from the excessive stress which may have increased the nervous and mental tension. The

unconscious state has different degrees of depth depending largely on the amount of tension previously experienced. Usually it is not the degree of stress per se, but the amount of repression which the epileptic exercises which springs the fit-gun, as it were. From more recent studies we have analyzed the spontaneous productions or mental content of individual petit mal attacks. In these short delirious or automatic episodes occurring with or immediately after these seizures, one may find from the mental content the type of stresses which irritate and baffle the epileptic. These as well as the deeper strivings which may be recovered in the fit furnish data on which we may construct a rational reeducational therapy of the broadest yet specific moment. Time forbids our citing specific or detailed illustrations here. A series of such cases studied in detail are being published elsewhere. Suffice it to say that in the long series of cases studied at Craig Colony and in private practice we have learned more precisely in the mental content what the everyday conscious conflicts of epileptics really are. The basic idea in such studies is to determine the particular kind of defective make-up and its specific conflicts in everyday life. Then we try to induce the epileptic to take a better insight as to his innate faults and his conflicts and thus cause him to see the sequence and consequence of his crude handling of life.

The real therapeutic advantage to the epileptic in this whole procedure is comparable with that obtained by those who suffer from the benign psychoses, who, we know, are very considerably aided in making a more stable recovery from the individual attacks, and further fortifies the individual against possible recurrences of his psychotic episodes. Any one following this therapeutic method should bear in mind that continued epilepsy from its very nature is a deteriorating disorder physically and mentally, and if it be allowed to progress, it steadily lowers the capacity of the individual to make new or difficult adaptations, hence any principle of treatment which is based on a reeducational plan of living, as this method does, is itself liable to be very stressful. If it is done without due care and patience it places extra strain on the epileptic and may thus entail more seizures than before it was begun. Frequently the plan of analysis and reeducation given here must be undertaken for short periods only (days or weeks) and then the patient should be allowed to rest in his newly acquired position until he thoroughly accustoms himself to it, after which advanced work may again be undertaken. If the same mental content repeatedly returns in the automatic delirium in attacks, one must conclude that the special conflict brought out is so basic that no mere analysis will set it free. Then a practical system of training and reeducation must be instituted. Sooner or later one finds that analysis of the mental conflicts but indicates the road for an entire system of reeducation for these epileptics. The individual's susceptibility for this reeducation will give a just estimate of the prognosis in the particular case. It has also been found that coincident with a gradual disappearance of epileptic reactions, as shown in the fits per se, there must be a corresponding increased capacity for work and other spontaneous living interests. Usually these latter clinical evidences of betterment are heralded by a shortening in the reaction time and a lessening of perseveration. The mere cessation of attacks, without corresponding improvement in the psychologic tests, really indicates that the underlying

deteriorating disorder has not been as yet favorably modified, and the epileptic attacks may in the course of time be expected to return.

Finally, one may say that a study of the epileptic make-up and the mental content in epileptics, both everyday conscious ones, as well as those shown in the unconscious state, demonstrates (1) the depth of the unconscious regression; (2) the special type of stress which the epileptic has, and (3) the specific type of primary defect in his endowment which must be handled in reeducation. Its therapeutic value in addition to the foregoing is (4) to furnish a specific point of analytic attack by simple explanatory talks, thus increasing the patient's insight into his disease, and (5) to show more definitely the type of special reeducation which should be adopted for each individual patient.

ABSTRACT OF DISCUSSION

DR. ARCHIBALD CHURCH, Chicago: I would like to ask Dr. Clark to give us more concretely the results obtained by the application of these views in the management of epilepsy.

DR. MEYER SOLOMON, Chicago: I wish to ask Dr. Clark how he can prove that cases which do not develop real reactions of convulsive type, but which are of the sort he has described under the name of the epileptic constitution are really epilepsies if they do not develop the reaction of the convulsive type. It all depends on how you want to use the term epilepsy. If there are no petit or grand mal attacks, how can you say that the patient has epilepsy? The sort of makeup Dr. Clark has described may be found in the feebleminded, in neurotics, and in many other persons who do not develop epilepsy.

DR. JOSEPH BYRNE, New York: I became familiar with Dr. Clark's work some time ago and have applied it at my own clinic. The method we formerly employed was the usual routine method, thorough examination in every case followed by operation in suitable cases. In epileptics of various grades we now combine the psychologic and operative methods. In other words, before any attempt at decompression is made, analysis of the personality and an attempt at reconstruction through education are made. Our results have been quite good. Perfect cures are not always to be expected, but the improvement in our patients was such as to convince us of the worth of the method.

DR. L. PIERCE CLARK, New York: The method of mental treatment which I briefly outlined in my paper has slowly been built on careful clinical experience and is still being modified and elaborated. It is primarily based on an intensive study of the epileptic as an individual, and the disorder of fits as a more or less necessary corollary of such a potential character makeup when encountering undue stresses. I believe it enhances the former physical and empirical therapy for this disorder at least 50 per cent. It is particularly serviceable in the very earliest cases, but has been found of inestimable value in the care and treatment of the interned cases also. My scheme makes no claim to say exactly what the nature of idiopathic or essential epilepsy really is, but we should seize on those modifiable factors in the epileptic individual and thus improve his social adaptability in its widest sense. To do this most successfully we must detect the epileptic character and habit at the earliest possible moment.

Comparison of Value of Milk with Other Protein Foods.—

With bottled milk at 14 cents a quart, 1 cent buys 46 calories (fuel food), including 1/15 ounce of protein (building food). For porterhouse steak at 35 cents a pound, 1 cent buys 30 calories of fuel food, including 1/15 ounce of protein. With eggs at 60 cents a dozen, 1 cent buys 16 calories of fuel food, including 1/30 ounce of protein. At the foregoing prices 1 quart of milk supplies as much food as 10 ounces of porterhouse steak or 8 eggs.—*Weekly Bulletin* New York City Department of Health.

CARBON MONOXID POISONING: ITS NERVOUS AND MENTAL SYMPTOMS

REPORT OF CASE *

CHARLES W. HITCHCOCK, M.D.

DETROIT

McNally¹ makes the somewhat surprising statement that "deaths from carbon monoxid poisoning in large cities now exceed those from any other poison." The total number of gas cases in Cook County, Ill., for 1916 was 501, nearly 8 per cent. of the entire number of coroner's cases. Much of the increase, of course, is a purposeful one, illuminating gas being an easily available means of suicide. Industrial and domestic sources are, however, not a few.

"The proportion of carbon monoxid differs greatly in domestic and industrial gases, varying between 4 and 30 per cent.—in coal gas, 4 to 10 per cent., and 30 per cent. in water gas, and 20 and 30 per cent. in producer gas—almost all illuminating gas containing a large proportion of water gas. Stoves, salamanders, furnaces, blast furnaces and gas engines are not infrequent sources of this poison. Increased use of gas in the winter months accounts for the large number of deaths at this period of the year. If all gas stoves, plates and heaters were connected by metal instead of rubber, many lives would be saved."

As to the operation of the poison, I quote McNally further: "Carbon monoxid combines chemically with the hemoglobin of the blood to form a stable compound. According to the research of Nicloux, one volume of carbon monoxid acts like 220 volumes of oxygen. The corpuscle is not dead. All it needs is oxygen under sufficient tension to displace the carbon monoxid." In line with this are cases reported by J. Bock.²

Body of man found on floor near defective stove, two thirds hemoglobin of his blood transformed to carbon monoxid hemoglobin. A baby near him showed no signs of poisoning. Body of wife in adjoining room, and only one fifth of her hemoglobin had been so transformed. It is assumed that she was as deeply poisoned as husband, but sought another room where blood threw off the carbon monoxid gas. Bock says: "Evidently the central nervous system becomes irreparably injured from the after-effect of the protracted asphyxia."

With the various tests for carbon monoxid we need not concern ourselves here. My object in presenting this paper is twofold: (a) to call special attention to the dangers arising from automobile exhaust gases in closed garages, and (b) to note the nervous and mental symptoms attendant on carbon monoxid poisoning. Cases of carbon monoxid poisoning from the inhalation of automobile exhaust gas are, I think, more commonly fatal than otherwise. The files of an Accident Insurance Company, which paid the claim for the death, enable me to report the following case:

CASE 1.—S. M., residence, Chicago, employed as a chauffeur of a private car, had entered the garage, a small and closed one, at noon, Nov. 20, 1915, for some work about the machine. About two hours later a maid sent to call him could hear the engine running, but received no response to her summons.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918.

1. McNally, W. B.: Carbon Monoxid Poisoning, *THE JOURNAL A. M. A.*, Nov. 10, 1917, p. 1586.

2. Bock, J.: *Hospitalstid.*, Copenhagen, Jan. 2, 1918.