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Contributors

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Postencephalitic Respiratory Disorders

SMITH ELY JELLIFFE, M.D.

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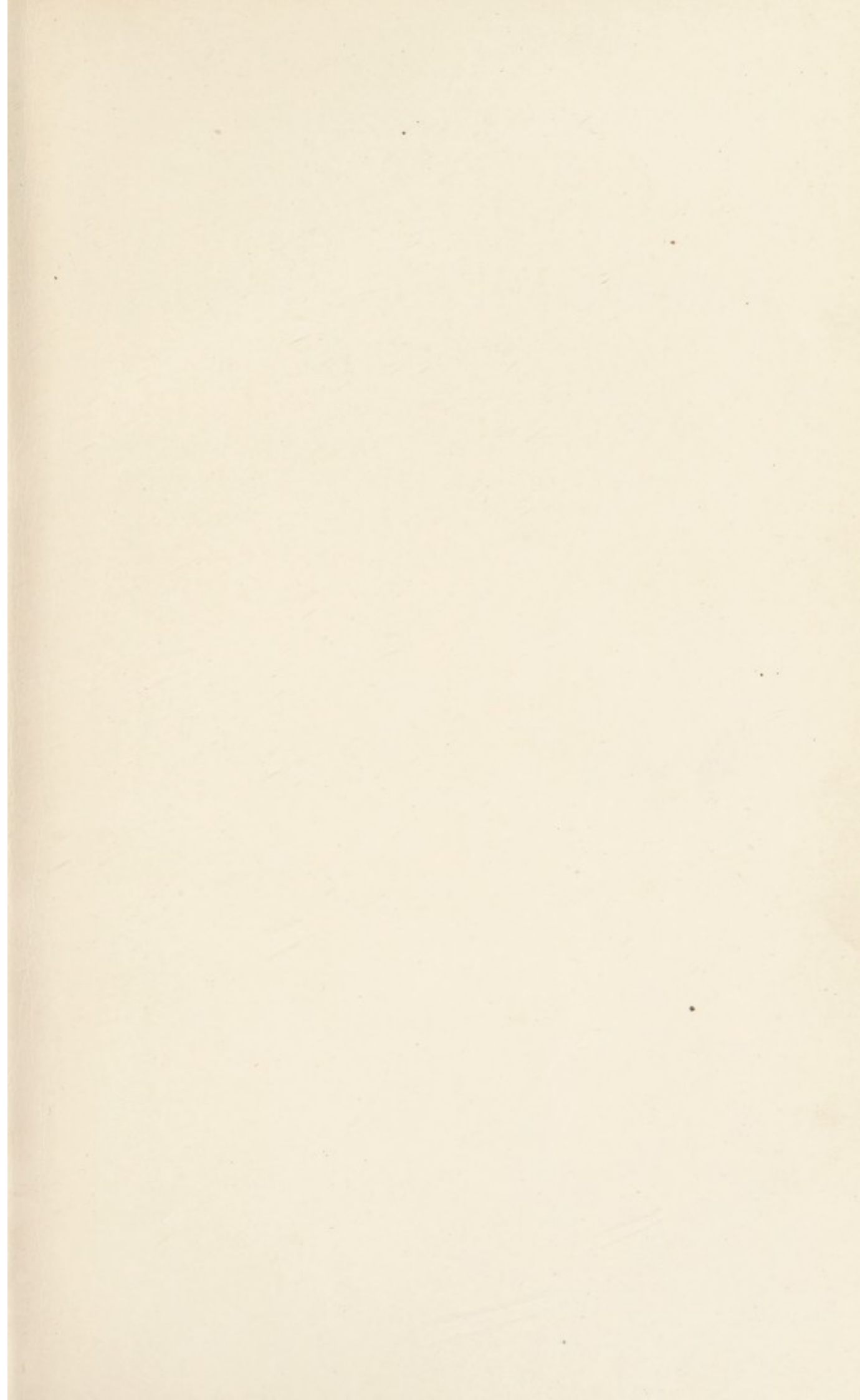


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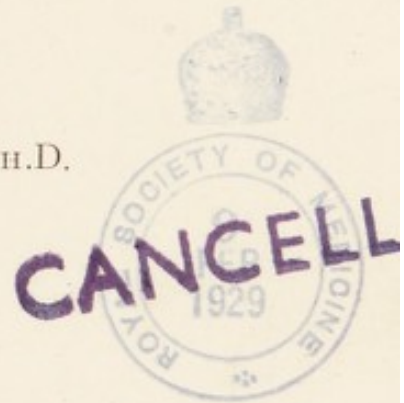
NERVOUS AND MENTAL DISEASE MONOGRAPH SERIES No. 45

Postencephalitic Respiratory Disorders

Review of Syndromy, Case Reports, Physiopathology, Psychopathology and Therapy

By

SMITH ELY JELLIFFE, M.D., PH.D.
OF NEW YORK



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INTRODUCTION

In the monumental strides made by neuropsychiatry during the past ten years no single advance has approached in importance that made through the study of epidemic encephalitis.

No individual group of diseased reactions has been as widely reported upon, as intensively studied, nor as far reaching in modifying the entire foundations of neuropsychiatry in general.

While as yet the etiological factors, the constitutional or dispositional backgrounds which permit infection, and the epidemiology, are far from being completely grasped, the advances made in our understanding of cerebral mechanisms have in truth been enormous. The entire symptomatology of affections of the striatum, inter-brain, and midbrain structures has been greatly clarified, a much greater insight gained into the problems of structure and function of these parts, and above all the synthesis of the working parts of the body as a whole, physical, chemical, biological, psychological, and sociological, has progressed, through the medium of this disease process, into a pragmatic and comprehensible whole of great significance to neurology and psychiatry alike.

An entirely new orientation has been made imperative. An orientation towards certain conceptions of disease, grasped for centuries by a favored few, has been made the property of the many, and the future is filled with promise that some of the darkest chapters in the understanding of the emotional and mental life of the individual will be greatly clarified by this "borderland" process which has reached on the one hand into the deepest recesses of the vegetative organization of the bodily organs, and on the other hand carved out as it were cameos of behavioristic reactions, the further scrutiny of which will resolve many a heretofore uncomprehended subtle mental condensation product. Thus complex vegetative processes all too illy understood in current physiology have been most intricately dismembered into their simpler component parts and the equally if not more involved mental syntheses also cut into and partly fragmented into simpler fundamental integers.

It is due either to the chronicity of the process or to the psychological factor of regression that a continuous series of observations has been made possible. Among these chronic or regressive manifestations those involving respiratory behavior stand out as possess-

ing dramatic qualities. They also offer many opportunities for extensive as well as intensive research.

I have therefore brought together some of the outstanding features of this type of anomaly which is in reality a behavior disorder in the large sense, rather than as a disease of the respiratory mechanism such as it seems to be, by reason of the prominent use made by the patient of the respiratory apparatus.

Limitations of professional work have prevented a more thorough and detailed monograph worthy of the valuable material surrounding one, but it is offered as a small contribution to an understanding of a series of reactions which have been observed since the days of Hippocrates.



PART I

HISTORICAL RÉSUMÉ OF CLINICAL MATERIAL

Having had the opportunity to observe for protracted periods several characteristic examples of postencephalitic respiratory syndromes, and having already called attention to the phenomenology,* from the general standpoint of the relationships of somatic pathology to psychopathology as illustrated by one patient under consideration, the present contribution aims to enter into a discussion of this particular syndrome abstracted from the larger frame of the post-encephalitic mosaic.¹

Respiratory involvements in the acute encephalitic attack have been noted from the first by v. Economo and even before.² In previous epidemics of "influenza," "zona," and situations which must undoubtedly be recognized as having very intimate relations to epidemic encephalitis, they have been seen and recorded, but only during the past epidemic extension may it be said that they have been as carefully and as exhaustively studied.

There can be little doubt that the studies of the past ten years which have been more or less focused upon midbrain and interbrain structures, particularly those upon the basal ganglia, have sharpened the observational power of physicians, particularly neuropsychiatrists, and thus brought into prominence what Strümpell so graphically termed the amyostatic syndrome, heretofore observable but strangely overlooked.

Concerning this aspect of the psychology of seeing things either too late, or so badly, or not at all in medicine, one may well recall Charcot's comment when Duchenne of Boulogne called attention to

* Jelliffe, S. E. Somatic Pathology and Psychopathology at the Encephalitis Crossroad: A Fragment. *Jl. Nervous and Ment. Disease*, LXI, 1925, 561-586.

¹ Jelliffe, S. E. Resemblances and Differences Between Epidemic Encephalitis and Schizophrenia. *Transactions of the Research Society of Nervous and Mental Disease*, Dec. 23, 24, 1925. *Am. Jl. Insanity*, 1927.

² Compare Crookshank, *Proceedings Royal Society of Medicine*, 1919; this same author's volume on Influenza; Heinemann. Jelliffe, *Nervous Syndromes in Influenza*, in same volume, pp. 351-387, and also Jelliffe, several papers upon Nervous Complications of Influenza; also Leichtenstein's classic upon Influenza. See Aronson's citations of Oppenheim's descriptions and the cases of Dana and Schlapp, Brooks and Janeway.

his now well known type of Muscular Atrophy. "How does it come about that one could discover an affection which has existed since the days of Hippocrates and then one fine morning one perceives there are people with atrophied muscles?" "Why does one have to be shown a thing twenty times before they can see it?" Charcot asked. Certainly this comment pertains as well to the "newly discovered"³ epidemic encephalitis syndromes.

With the vast multitude of these acute syndromes we are not here concerned, especially the respiratory ones, which have been very frequent and at times severe, even fatal, from direct involvement of the more vital respiratory nuclei. [See Goldflam's paper to be cited.]

As for the respiratory syndromes which may be discussed as postencephalitic, that is arising either by very gradual stages to a full respiratory modification some months or even years after an attack of some infectious disease, either thought of as "influenza" or "encephalitis," or "unknown," we here purpose giving an extended discussion.

It may be recalled that v. Economo⁴ was also one of the first to recognize the chronic types. At the same time it must not be overlooked that "recidive" or "reinfection," or "chronic relapsing" cases of neurological interest have been frequently mentioned by the students of the influenza epidemic of 1889, and Leichtenstein (p. 210) deals with them quite specifically. Thus the syndromes of paralysis agitans, tabes, hemichoreas, hemiataxias, hemiplegias, tremors, myoclonias, multiple scleroses, hyperthyroidisms, dementias, lethargies, psychoses, pseudoappendicitis, and a host of others, were known as following in the wake of the "influenza" epidemic of 1890. It is unnecessary to go over this literature at this time, but the student of history must do this else the present "epidemic encephalitis" will be in danger of strange misinterpretation. With these difficult epidemiological problems, however, we are not here concerned. We refer the interested student to Crookshank's study already cited.

As for the "respiratory types," they can be found in this older literature under the rubrics of hysteria, hysterical tics, cramps, etc., and it is not at all surprising that nearly all of the studies to be here reviewed speak of this conception as having been first thought of

³ For an excellent philosophical discussion about lost knowledge and rediscovered knowledge, see D. S. Robinson, *The Logical Significance of Rediscovered Knowledge*, *Journal of Philosophy*, XXII, 1925, 346.

⁴ Von Economo. *Münch. med. Woch.*, 1919, p. 1311. *Wien Arch. f. inn. Med.*, 1920, Vol. I, Heft 3.

when observers were first brought in contact with these phenomena in the present epidemic. Thus Turner and Critchley, in their masterly paper, say "such cases were regarded at first as rare or unusual manifestations, frequently labeled 'hysterical' in nature." Gradually however, it became realized that disorders of respiration form well defined and important sequelae which may constitute the sole after result, or may on the other hand accompany parkinsonism, mental aberration, sleep disturbance, or any other well recognized sequel.

Many of the older descriptions of hysterical dyspnea show the occurrence of these types of dyspnea. They can be collected in great number if one has the industry or the interest to look for them. Thus to take at random one of the Paris Theses, that of Henri Loubry, on "Contribution a l'Étude des Dyspnées d'Origine Hysterique," 1906, and opening at p. 44, Observation X, one finds a perfect example of a "postinfluenzal"—tachypnea of the type described by recent authors. This patient had bradypnea, tachypnea, apnea with cyanosis; they even did three tracheotomies upon this twenty-seven-year-old individual. His respiratory attacks came on in June, 1905, after an attack of "rhume" in December of the previous year. He had sialorrhoea, tetaniform attacks (a la Barker and Sprunt), and opisthotonos (a la Parker cases), etc.

Since it may be a part of the purpose of this paper to discuss these "hysterical" manifestations, Charcot's (1886) "tachypnea hysterique" and Weir Mitchell's (1883-1893)⁵ studies on the same subject may prove of special interest later.

Neglecting for the time being the older studies upon these dyspneas, and coming to the "encephalitis" studies, the earliest reports I have found are those of Marinesco, shortly followed by the case of Aronson, and then of Barker and Sprunt, Bériel, Insabato, Kennedy, Hyslop and Davis, and others, all in the year 1921. Har-doin's initial thesis, kindly sent me by Professor Bériel, appeared in this year. These I here present in abbreviated abstract form:

Papin, Denechau et Blanc present very briefly⁶ the first observation belonging possibly more in the acute phases than the chronic, hence only mentioned here.

⁵ Mitchell, S. Weir. Hysterical Rapid Respiration, with Cases, Am. Jl. Med. Sc., CV, 1893, 235. Some of these cases are undoubtedly "post-influenzal." Lectures on Nervous Diseases, 2d ed., pp. 198 et seq.

⁶ Bull. Soc. Méd. d. Hôpitaux, July 10, 1919.

Marinesco⁷ reports a number of acute syndromes, but *Case IV* of this series may start this account of the postencephalitic respiratory syndromes. He was a twelve-year-old boy taken January, 1920, with headache and alternating fatigue and agitation. Lethargic crises came on four days later. A month later rhythmic, muscular movements of the upper left and lower right limbs. No intelligence defect. In June he had peculiar respiratory movements apparently associated with other muscular movements. The opposite side of the thorax seemed asleep. There was a definite tachypnea synergized with the biceps contraction of the right side being 41 to the minute, the pulse was 80. The chest movements were not exactly synchronous with the biceps movements occurring about 1/5 of a second in advance. (Pneumomyograph). The respiratory movements were bigeminous after 1-2-3 regular excursions. During the lethargic spells the respirations sink to 22. After two months both biceps were contracting at the rate of 41 per minute.

Case VI (p. 18). A sixteen-year-old girl first taken ill in March, 1920, with headaches, fatigue, insomnia, anorexia and constipation. She soon began to have rhythmic painful movements in the arms and by June, 1920, these rhythmic abduction and adduction movements of the arms were accompanied by synchronized respiratory movements at the rate of 52 to the minute. Close examination of the tachypnea shows it to be slightly interrupted at inspiration; less often the expiratory movement is shorter. Bigeminal respirations appear. Dissociated tetanic movements at different rates occur in the biceps and triceps muscles.

Aronson's⁸ is the first case report in the United States of a postencephalitic respiratory syndrome. It occurred in a boy eight years of age.⁹ He had a mild headache and temperature—"influenza," and then an accident, more frightened than hurt, and then after about 5 to 6 weeks developed slight character anomalies. Careful history taking showed he had had a diplopia at the time of his influenza. He then developed a mild parkinsonism in about 6 to 8 weeks and then a protracted and persistent tachypnea, of 45 to the minute, and tachycardia. There were irregular periods in his breathing, a few Cheyne-Stokes and some arrhythmic dirotic periods. Aronson specifically asks whether this will continue and what the boy's fate will be and mentions never having heard of a persistent "tachyrespiria."¹

⁷ Marinesco, G. Contribution a l'étude des formes cliniques de l'encephalite épidémique. *Revue Neurologique*, XXXVII, 1921, 1, January.

⁸ Aronson, L. S. Encephalitis with Unusual Sequelae. *Neur. Bull.*, III, 1921, 113, March.

⁹ Delayed birth—"blue baby"—of interest in reference to discussion of Birth Trauma of Rank, discussed by me in *Journal of Nervous and Mental Disease*, June, 1925.

¹ Turner-Critchley write of this boy's recovery after seven months. This case has not recovered according to personal communication of June, 1926, and has developed some interesting regressive character anomalies.

Barker and Sprunt's case, reported in May, 1921, and Bériel's short note before the second annual reunion of the Paris Neurological Society in June, 1921, are next in chronological order.

This interesting case report of **Barker and Sprunt**² first presented in May, 1921, before the Association of American Physicians, which when studied with our own case, the work of Rosett on Hyperpnea and with the study of Adlersberg and Porges³ offers extremely suggestive material concerning the neurology of metabolism.

The patient was a young man of eighteen; he had "hard attacks of breathing," difficulty in sleeping and "slipping spells." The history given is very detailed and extensive, of which the authors themselves make the following summary:

(1) Postencephalitic state with petit mal attacks, functional paroxysmal hyperpnea, and a single spontaneous attack of tetany.

The chief features of interest in the present connection are the acute hypomaniacal symptoms of the onset with diplopia, and fever in January, 1920. Later there were attacks of hyperpnea which in February, 1921, are described by the authors as "very deep and labored respirations, the accessory muscles being brought forcibly into play." This breathing does not interfere with the patient's talking. The paroxysms lasted from 2 to 3 minutes. The attacks were divertible. He had many pimples on his face. During the examination made by Barker there was a definite bilateral carpal spasm, persisting for 15 to 20 minutes (Fig. 1). There was no involvement of the feet as did occur in Jelliffe's case. Chvostek but no Poole-Schlesinger leg sign.

The authors discuss especially the relationship of the tetaniform spasm to the hyperpnea and lay much stress upon what they term the "psychoneurotic element." This paper deals particularly with the tetany and states that it is among the first to be reported. [See observations made upon "hysterical dyspnea" with "tetany" in Loubry's 1906 thesis, p. 44 et seq. 47, and Hall's retrospective note, p. 5, of a case seen by him in 1903.]

A general paper contributed by **Barker**⁴ later summarizing some of the more striking sequels or "residuals" of encephalitis, occurring in at least 70 per cent of the attacks. He here mentions Aronson's case

² Barker, L. F., and Sprunt, T. P. A Spontaneous Attack of Tetany During a Paroxysm of Hypernoea in a Psychoneurotic Patient Convalescing from Epidemic Encephalitis. *Endocrinology*, VI, 1922, 1. *Tr. Am. Physicians*, May, 1921.

³ Adlersberg and Porges. Die neurotische Atmungstetanie, eine neue klinische Tetanieform. Vienna, 1924.

⁴ Barker, L. F. Sequelae of Epidemic Encephalitis. *N. Y. State J. Med.*, XXII, 1922, 251, June.

and one observed by himself and Sprunt (see previous case) of tachypnea with tetaniform attacks.

Bériel⁵ demonstrated a case at the second annual reunion of the Paris Neurological Society in June, 1921, of which a short abstract deals with respiratory disturbances in the acute phases and also with postencephalitic attacks of dyspnea related to the rigidity of the body musculature is given in the report of this meeting. He mentions these respiratory difficulties as having occurred in three of thirteen cases. These showed very rapid respirations, 60 to 80, and *superficial*. Salivation was also present. He believes that the evidence favors the peripheral origin of this dyspnea, and it seems to be relievable. He calls it a *miscropnea* (certainly not comparable to Jelliffe's case I in this respect) and he deals with it as a compensatory phenomena.

In this same year, 1921, one finds a brief note by **Krambach**⁶ (page 200) in a discussion of anxiety in a polemic with Schultz (Berl. kl. W., 1921, p. 245) saying that a case II had a marked anxiety state accompanying a feeling of air hunger with forced inspirations. These occurred in a fifty-three-year-old man and came on a year after his encephalitis.

An interesting study by **Insabato**⁷ given at the Italian Congress of Neurology, October 19-21, 1921, deals primarily with the subject of alterations in character in the psychical symptomatology of epidemic encephalitis, hallucinations specially, and is finished by a brief note on "respiratory disturbance in postencephalitis cases."

Insabato speaks of them especially as relevant to the aspect of psychogenesis, utilizing the older concepts of "functional" and "organic." Many neurasthenic states, many changes of character, many postencephalitic nervous disturbances, thought to have had no organic basis were thrown into the pithiatism group.

The author cites very briefly four instances of postencephalitic character changes. *Case 1*: Seventeen years old. Accessions of dyspnea coming on without apparent cause and giving rise to great oppression and anguish. They last a few minutes only.

Case 2: Fifteen years of age. Attacks of dyspnea arising upon emotional contact, such as lively talk with a companion, a notice—lasting some time and giving rise to a state of gasping in which the patient grasps hold of any object or any person as an anchor of safety.

Case 3: Thirty-two years old, a month after an encephalitis, with mild general rigidity. Several attempts at suicide. Has a profound

⁵ Bériel, M. I. Troubles Respiratoires. Rev. Neur., XXXVII, 1921, 640, June.

⁶ Krambach, R. Dauersymptome und amyostatische Krankheitszustände nach Enzephalitis. Monatsschrift f. P. u. N., 1921, L, 189-201.

⁷ Insabato. Breve considerazioni su di un peculiare disturbo respiratorio nel postencefalitici. Riv. d. pat. N. u. M., XXVII, 1922, 75-93. Italian Congress, Oct. 19-21, 1921.

sense of being ill, has salivation, with attacks of dyspnea, whenever he sees the physician, or is under observation.

Case 4: Forty-eight years of age. These dyspneic attacks are reported as conditioned by the physician or by general emotional conditions.

“Encephalitis, with its imperceptible transitions from distinctly organic to distinctly functional disturbances, cuts in my opinion the Gordian knot of the problem, reducing the two terms to their true value, namely, that of being opposite and yet complementary viewpoints, of which our mind cannot rid itself in the study of the actual biological unit.” This is his concluding remark.

Among the cases reported by **Kennedy, Davis and Hyslop**⁸ before the Research Society of Nervous and Mental Disease in December, 1921, published in July, 1922, they speak of the disturbed breathing in two and mention briefly a third.

Case H. G. Ill in December, 1918, with influenza (?). Severe headache and intense sleepiness day and night with reversal of sleep mechanism after three or four weeks. Seen in the spring of 1921 he had some parkinsonism, great inability to do things. Great anxiety on effort, shivering attacks and respiratory disturbances. These attacks lasted from 15 to 30 minutes. During them he felt as though he could not fill his lungs with air, and he breathed with all of his accessory respiratory muscles from 56 to 64 times a minute. At other times he experienced what seemed like a spasm of the laryngeal muscles and breathed more and more stertorously and ineffectively so that the lips were cyanosed and the eyes protruded. Phenomena such as these have appeared at times in hysteria, and various physicians have considered them as hysterical in this case. This explanation would not account for the patient's abnormal thirst for ice water. He consumed for a period of 18 months, between 30 and 40 quarts of water every day and had proportionate polyuria. [Compare with Case I of Jelliffe.]

Case 2. (p. 42) A boy of fourteen had his acute attack of encephalitis in January, 1920. There was an apparent recovery for many months. He then developed polydipsia and polyuria with tremors in the upper extremities, excessive salivation and distressing paroxysmal attacks in which breathing was exceedingly rapid, labored and difficult, quite similar to the preceding patient.

In the discussion the authors note: “Breathing spasms were seen twice. One patient, E. P., just mentioned, had had from the beginning very irregular breathing—both in depth and rate—accompanied by curious noises which occurred during sleep. *Case 3.* S. J., fifteen months after

⁸ Kennedy, F., Davis, T. K., and Hyslop, G. H. An Additional Contribution to the Symptomatology of Epidemic Encephalitis. *Am. Archives of Neur. & Psychiatry*, VIII, 1922, 40, July.

apparent total recovery from encephalitis, had a parkinsonian relapse, accompanied by attacks of rapid deep breathing. These increased in frequency and at length continued through the waking hours, causing much fatigue. Emotion would initiate them, but when started they could not be stopped until their course was run—usually in a minute or two. There was never any feeling of dyspnea, but a sensation that the lungs could not be filled, and he had a desire to expand them as much as possible.”

In **Ponticaccia's**⁹ communication the author refers to attacks of dyspnea in one of his postencephalitic myoclonic patients.

Hardoin's¹ thesis calls for definite mention in that his is the first monographic study devoted to the clinical types under consideration. Having had in mind the idea of studying the whole parkinsonian symptomatology Hardoin tells us he was dissuaded from so vast a project by Bériel and limited his study to this as yet little known form.

Hardoin speaks of the febrile dyspneas of the early stages, already much discussed in the acute periods by Rollet, v. Economo, Marie and Lévy and a host of others. He then takes up those respiratory difficulties of the chronic stages (p. 17) discussing forms of tachypnea and respiratory tics. Two cases are reported one conditioned by a diaphragmatic myoclonia, the other more difficult to interpret. In his general résumé he cites 10 observations. (1) Marinesco's case of March 16, 1920—an acute fatal case—death in 3 weeks. (2) Case of Roubier (These Verdet) also an acute fatal case after five weeks. (3) Papin, Denechau et Blanc. Dypneic crises with cardiac irregularity coming on at night which appeared one month after the acute onset and later disappeared—4 months (here noted). (4 and 5) Marinesco's cases here reported. (6 and 7) Bériel's cases here cited. (9 and 10) His own 2 cases.

Case 1. A married woman of thirty-two with acute encephalitis in February, 1920. A month later she felt oppression in her breathing and by May she had established a constant form of attack which usually began every afternoon between 5 and 6 and persisted into the early hours of her sleep. She had a tachypnea of 80 to the minute, very superficial, but interspersed with deep inspiratory movements. These had persisted up to some time in August even though her general state was much better.

Case 2. A married woman of twenty-seven. Encephalitis (7 months pregnant) in January, 1920, recovery from acute stage, accouchement March normal. Then by January, 1921, gradual development of parkin-

⁹ Ponticaccia. Postumi dell'encefalite epidemica. Giornali di Clinica Medicina, X, 1921.

¹ Hardoin, B. Etude des Troubles Respiratoires dans les Etats Parkinsoniens liés à l'encephalite épidémique. Dijon, 1921.

sonism. Then a persistent tachypnea marked and almost continuous—60 to the minute (pneumographic tracings).

Following the chronological lead, a number of studies appear in 1922, led by Goldflam's (January) interesting résumé of the great encephalitis epidemic in Germany of 1920. Then appear papers by Pardee (February), Hoover (April), Francioni (May), Bilancioni and Fumarola (July), and the initial studies of Marie, Binet, and Gabrielle Lévy (July), which culminated in Mlle. Lévy's classical monograph. Then the reports and studies by Capgras and Reboul Lachaux, Parker, Lewy, Vincent and Bernard, Roubinovitch, Baruk and Bariety, Robin, Babinski and Charpentier, Souques and Bouttier, abbreviated abstracts of which follow:

Goldflam's² contribution dealing primarily with the acute symptomatology speaks particularly of the continuance of the early respiratory symptomatology into later stages of the disease (p. 60). Frequent breathing, apnea, Cheyne-Stokes respirations, irregular breathing with yawning, paroxysmal attacks of polypnea, 50 to minute, with dyspneic feelings, anxiety and cyanosis are noted. Nasal paresthesiae are quite frequent with these respiratory attacks and nose boring is quite striking. (p. 62) Goldflam notes "We have localized the tachypnea occurring in the beginning of the disease to a spreading of the process to the breathing centers in the floor of the IV ventricle. We have been able to localize the process there in cases of death due to respiratory paralysis. At first sight the occasional extremely grotesque respiratory disturbances of children gave the impression of a secondarily arising "ausgepropften" neurosis all the more so since no hindrance to breathing or objective sign of dyspnea, cyanosis, etc., were present and in many cases the respiratory disturbances seemed under the mental control to a certain extent. One fact alone, however, that at times a tachypnea (30-40 to the minute) would persist even during sleep negatives this opinion and decides in favor of the organic lesion in the neighborhood of the respiratory center.

Goldflam cites (p. 62) a case of bradypnea (12 to minute) in a thirty-five-year-old man showing 15 months after the encephalitis.

Pardee³ mentions having seen a postencephalitic case of continuous tachypnea such as Aronson's, but calls particular attention to the paroxysmal type, five instances of which had come under his observation. These attacks begin gradually and mount in their intensity, the breathing becoming faster and deeper as in Jelliffe's Case I. Inspiration is long and

² Goldflam, S. Die grosse Encephalitis epidemie des Jahres 1920. Deut. Zeit. f. N., LXXIII, 1922, 1.

³ Pardee, I. H. Spasmodic Forced Respiration as a Sequel of Epidemic Encephalitis. Jl. Am. Med. Assoc., LXXX, 1902, 179, February.

deep and so is expiration, ending in a grunt. Distress and anxiety accompany the attack. They clench and unclench the hands, the musculature becoming tense or rigid, and bending forward or backward may occur. In two of his cases an apneic phase with cyanosis supervened. One almost showed convulsive phenomena. The paroxysms lasted five to fifteen minutes, three or four times daily and often just before sleep at night.

One case history is given of a man of twenty-two with a severe cold in February, 1921, with slight lethargy. Later sleep formula inversion. A coughing respiratory tic developed soon after his illness and several months later the paroxysmal respiratory cycle began. They lasted about five minutes and consisted of deep fast respirations, chiefly through the mouth, with distortion of the facial expression and use of the accessory respiratory muscles. Expiration was forced and accompanied by a noisy cough-like grunt. Pardee would incline to a thalamic localization for his explanation of a part of the situation.

Although **Hoover's**⁴ case does not strictly pertain to the groups herein considered its clinical features are so closely related that it seems desirable to include it in the series.

The patient, a man of thirty, had a meningoencephalitis in December, 1920. He slowly developed a parkinsonian facies with no other residuals. In February, 1922, he came to the hospital for a difficulty in breathing. Every inspiration was blocked and the harder the effort the greater the difficulty. He developed great anxiety over his peculiar dyspnea which was worse with effort. Close scrutiny showed that there was a paralysis of the dilatores and compressores alae nasi which accounted for the inspiratory difficulty.

Francioni⁵ in his first paper calls attention to Mendicini's interesting pneumographic studies of respiratory alterations occurring in the acute phase of encephalitis. The respiratory quotient tends to be modified in that inspiration is greater than expiration and that interruptions in the rhythm are constant, although not periodic properly speaking. Bériel's study is alone known to him and commented upon.

His own case is of a seven-year-old girl who had an encephalitis in September, 1919. Respiratory symptoms were noted from the beginning. She came under observation in April, 1921. The respirations were rapid and ample. By a strong effort she could control these rapid and deep breathings but only for a short period. The attack is characterized by an increasing rapidity of respirations. This tachypnea is followed by a period of apnea associated with spastic tonic contractions

⁴ Hoover, C. F. Inspiratory Dyspnea Due to Paralysis of the Dilators of the Nares Following Acute Infectious Meningo-encephalitis. *J. A. M. A.*, LXXVIII, 1922, 966, April 1.

⁵ Francioni, G. Sindrome bulbare vago-ipertonica nel corso dell'encefalite letargica. *Il Cervello*, I, 1922, 145, March, June.

of all of the general and accessory muscles concerned in inspiration and expiration. At the beginning of this apneic period, she spreads her feet apart and bends forward grasping her legs behind the knees and remains in this position for a few minutes making forced expirations. (Photo.). The respirations have been up to 55 or 60 a minute. This is followed by a phase in which she straightens out, brings her right hand to her neck, throws her head back and makes a violent effort at inspiration, the face being congested, cyanotic, and hemorrhagic, the eyes immobile, the veins in the neck turgid and injection of the conjunctiva and even epistaxis may result. In the tachypneic phase the cardiac action is rapid; the heart stops in the apneic phase.

The author discusses at length the pseudoproblem of the psycho vs. somatic pathology, allying the situation with Gilles de la Tourette's disease (also see de Saussure's handling of the same situation), and then takes up the problems of localization of this vagohypertonic syndrome following Laignel-Lavastine for the terminology and Eppinger & Hess for the general conception.

Case 2. A girl of eleven years came to the clinic while the report of the first case was in print and is added. The history resembles very closely that of the first patient and does not need repeating (pneumographic tracing and pictures).

Bilancioni and Fumarola⁶ have made a very complete study of 10 cases with excellent pneumographic tracings almost the only study save those of Mlle. Lévy devoted exclusively to the respiratory anomalies. Having as senior collaborator an otolaryngologist, Bilancioni, the emphasis was laid upon the changes in the respiratory tract. The vocal cord movements are minutely gone into. In general they are described as resulting in a certain torpor of abduction and adduction (rigidity, J.) of the vocal cords, and are referred to mesencephalic implications. Lasagna has studied them exhaustively, also Favine—especially in the acute stages of encephalitis.

The present study is chiefly restricted to the postencephalitic phenomena as affecting the larynx and respiratory apparatus. As with the type of paresis of the labioglossolaryngeal apparatus so also the respiratory phenomena shows a paroxysmal arrhythmia. Epidemic hiccough is one of the most interesting of the phenomena under consideration. This is related to a rhythmic clonus of the diaphragm. Mendicini is quoted as one of the investigators of the respiratory anomalies, especially studied during sleep.

Case 1. A barber thirty-two years of age, January, 1920, encephalitis, oscillating fever for a month. A year later, especially at night, he

⁶ Bilancioni, G., et Fumarola, G. Su alcune rare manifestazioni, a forma bulbare (laringee e respiratorie), della "encephalitis chronica epidemica." Ann. di. Med. Navale, 29, 1922, Vol. II, 1, July, August.

showed attacks of anxiety with rapid respirations. (Pneumographic tracings.)

Case 2. A woman of twenty-eight with fever, headache and lethargy in February, 1920, which lasted about a month. She developed a diplopia and after 5 months showed tremors, salivation and other post-encephalitic symptoms. No notable respiratory signs.

Case 3. A nineteen-year-old contadino who had influenza in October, 1919, lasting some weeks. In April, 1920, began to have constriction in the throat and dyspnea. Insomnia, agitated and respiratory crises of about 2 to 10 minutes duration. Sleepy in daytime. The pneumographic tracing showed marked abdominal alterations quite incommensurate with the thoracic ones.

Case 4. Patient forty-four years of age, attacked with influenza in 1919. In January, 1920, a psychomotor agitation, delirium and fever. Influenzal bronchopneumonia was the diagnosis with recovery after a month. After this a period of rigidity in the muscles of mastication, sense of constriction in the throat and respiratory anxiety. In this patient there was a marked diaphragmatic arrhythmia with some interesting anomalous nasal breathing records.

Case 5. A schoolboy of fourteen who had a fever, diplopia and lethargy in October, 1919, lasting a few days. Then he had violent attacks of coughing, followed by dyspneic spells which persisted about a year. The respiratory attacks were characterized by a steadily augmenting rapid and deep breathing (48-50 to 70-80) with all the nasal, buccal and accessory respiratory muscles in operation (quite similar to Jelliffe's case I, Pater. I). There was no cyanosis and the length of the attack was quite variable.

Case 6. Fifteen years of age, always well, when one night in February, 1920, had a period of psychomotor excitement which repeated itself a couple of nights. The third day a diplopia with lethargy which soon passed. In June, 1920, incapable of applying self to work, no interest in surroundings, slow movements. Later typical parkinsonian facies. Changes chiefly rhinoötolaryngological of parkinsonism.

Case 7. A thirty-seven-year-old woman who in January had a psychomotor encephalitic onset with fever and insomnia at night, with gradually advancing motor stiffness. Three months later dyspneic attacks with a rapid breathing, noisy inspiration and expiration, lasting an hour or so, most marked at night. Salivation was pronounced throughout the crises (100 to 150 gm.). Typical pneumographic curve.

Case 8. A thirteen-year-old schoolboy. Encephalitis in 1919 with moderate fever for 3 to 4 days, amblyopia 5 days, lethargy, in daytime and agitation at night. Dyspneic crises, chiefly expiratory 70 to 80 to minute with coughing attacks, and modification of the voice. He had

20 to 25 of these attacks a day, lasting 3 to 5 minutes each; salivation occurring with the acme of the attack.

Case 9. An eleven-year-old girl. February, 1919, fever, vomiting, unrest, later nocturnal psychomotor agitation, sleepy in daytime. Fever ceased after 2 weeks. Three months later laryngeal attacks, and later in December respiratory hyperpnea in which she had her mouth half open filled with saliva.

Case 10. A twelve-year-old boy who first showed somnus inversus. Agitated at night, sleepy in daytime. This subsided after several months, but still showed traces of the inversion. After about a year he showed hyperpneic attacks with involvement of the accessory muscles. This patient showed a Chvostek sign.

These 10 cases, 7 men and 3 women all showed postencephalitic respiratory involvements. The authors call attention to Weir Mitchell's study of 1883, differentiation of asthma from hysterical dyspnea.

Four cases are described very briefly by **Marie, Binet and Lévy**,⁷ under the captions:

(a) Respiratory troubles per se, (b) spasmodic coughing, (c) respiratory tics.

(a) Polypnea, or tachypnea—with apnea or bradypnea. Paroxysmal polypnea—in crises—impossible to systematize, frequently in evening—5 o'clock or with nightfall—especially manifest in children—last less than an hour, several hours or the entire night: permanent.

Respiratory tics: describes associated with respiratory crises: with or without them. Nasal, buccal.

These are expanded in their complete discussions.

After calling attention to a number of studies upon respiratory disturbances in the acute stages of epidemic encephalitis, **Marie and Lévy**,⁸ here develop their earlier contributions with Binet (*Soc. med. d. Hop.*, July 7, 1922) upon respiratory sequels of the encephalitic process. They deal with the manifestations under three main groups: (1) Respiratory difficulties per se; alterations of the respiratory rhythm, chiefly polypnea (tachypnea), bradypnea, apnea, irregular breathing; (2) spasmodic cough, hiccough; (3) respiratory tics and rhinolaryngeal anomalies of sensation. As to the respiratory disturbances per se, polypnea is the most frequent with or without bradypneic or apneic phases. Cheyne-Stokes breathing they say they have not observed up to the time of the report. The rapidity varies from 48 to 80 per minute. This rapid breathing may be persistent or paroxysmal, the latter being

⁷ Marie, P., Binet, L., and Lévy, G. Les troubles respiratoires de l'encephalite épidémique. *Bull. et Mém. Soc. des Hôp.*, XLVI, 1922, 1075, July 7.

⁸ Marie, P., and Lévy, G. Deux manifestations particuliere de l'Encephalite Épidémique prolongée: Forme Respiratoire Forme Insomnique. *Rev. Neur.*, 1922, XXXVIII, 1233.

the rule. In children particularly the attacks tend to fall about five o'clock or nightfall and may last but half an hour or all night. No special cause is ascertainable. Emotional disturbance is a frequent starter. The objective disturbances are frequently accompanied by sensations of suffocation, distress and constriction of the chest, which with no edema or asystolic phenomena or true anxiety. (True anxiety is a frequent accompaniment. J.)

The permanent polypneas are usually accompanied by slower breathing, 20 to 30, and often is not observed. Paroxysmal crises come on with these patients. Smallness and irregularities of the pulse, fall of arterial tension and cyanosis and cold extremities are observable. Tendencies to deep sighing, to stoppage of breathing and to periodic breathing are noted and illustrated. They have noted but one case of bradypnea or apnea. (Soc. de Neurol., May 4, 1922. Rev. Neur., 1922.)

In Case 1 there were periods of apnea following a period of rapid breathing (see our Case I). Various nasal, buccal, and laryngeal sensations often accompany the attack; these cause various abortive or complete tics, accompanied by sniffing, blowing, puffing. Much mucus may accumulate in the nose. In case 3 a parkinsonian syndrome developed.

The second part of this paper deals with the insomnia forms of post-encephalitis.

Case 1. Thirteen-year-old girl. Undiagnosed encephalitis in January, 1920, with delirium, chorea, and myoclonus. Lethargy until June; whooping cough-like attacks for a year; then nasal sniffing, salivation, and spitting; then in August, 1921, crises of rapid breathing—thirty-five to minute (pneumograph II). Apneic for a few seconds at intervals, with sighing and moments of anguish, suffocation. Coldness and cyanosis of extremities.⁹

Case 2. Patient twenty years old. January, 1920, nondiagnosed febrile period, headache, delirium; six weeks later compulsory vomiting, later followed by obsessing desire for evacuations. November, 1920, respiratory crises began, with cessation of gastrointestinal activities. Respiratory crises at first paroxysmal, later permanent. Polypnea forty-one to minute, ceasing on distraction with irregular rhythm (pneumograph). Hands cold, cyanotic, and moist.

Case 3. Fourteen-year-old with nondiagnosed encephalitis in March, 1920, headache, diplopia, day-night reversal. Whooping cough-like attacks came on eighteen months later, incessant and persistent; polydipsia and polyuria. Abortive parkinsonian.

Case 4. Boy, thirteen years old, with nondiagnosed encephalitis with psychomotor agitated onset. Sleep rhythm reversed. Nasal sniffing tics

⁹ Especially interesting case from standpoint of transition from oral cannibalistic-sadistic-anal erotic phase to respiratory phase of libido expression, speaking psychoanalytically.

began ten months after the onset. Symptoms persisting two years, with amelioration of a parkinsonian attitude.

Cases 6 and 7. Ten-year-old and nine-year-old boys, respectively; chiefly insomnic form, with intermittent rapid breathing attacks. Tendency to brutality requiring internment of patients.

Dr. Gabrielle Lévy's¹ study is the first thorough presentation of the general problem which concerns us in this communication. She has studied and here sets forth in detail her observations of 129 cases of various forms of post-encephalitic disorder, ten of which are most definitely concerned with post-encephalitic respiratory types. This thesis is the parallel of the studies of Marie, Lévy and Binet, and Marie and Lévy herein referred to, and from the material here studied and the general survey of the literature Dr. Lévy has created the special categories which have been referred to in the abstracts already cited. The thesis collects and amplifies a number of studies begun by Dr. Lévy in the Salpêtrière under Professor Marie from 1918 onward. In the present thesis the detailed observation of 68 of the 127 cases studied are given, pp. 175 et seq. It is unquestionably one of the ablest of the many studies upon encephalitis.

We purpose abstracting here only briefly most of the cases in which the various types of tachypnea are recorded.

Case 35, p. 227. Male, thirty-five years of age, who had the lethargic neuralgic and eye palsy symptoms in February, 1920. He developed a tremor of the left arm by March, and salivation, stiffness in mastication, and then a gradual slight parkinsonism. In addition to a monotonous, jerky, explosive difficulty, he also had rapid and jerky breathing, 30 to the minute, with rapid heart action, 112. He made an apparent complete recovery after thirty months.

Case 37, p. 229. Male, twenty-nine years of age. In December, 1919, he noted he was always sleepy; he saw double at times and his vision was often foggy. In May, 1920, insomnia was pronounced. In August he had the sensation of being full of air, and would puff or blow. This would come on in periods of fifteen minutes or so every day. These crises became more frequent and would last longer, being almost constant by October and persisting until January, 1921. This tachypnea was intense and noisy. With intense effort the rate could be reduced—at periods of calm to 22 to the minute. The tachypnea would persist even during sleep. He had other symptoms, and at the end of two years was not improved.

Case 60, p. 272. A girl six and one-half years old with profound lethargic symptoms in March, 1920, following a short delirium. She lay

¹ Lévy, Gabrielle. Contribution à l'Étude des Manifestations tardives de L'Encéphalite Épidémique (Forme prolongée et reprises tardives). Thèse de Paris, 1922, No. 439. Vigot Freres, Paris.

in coma fifty-five days, with complete loss of visceral and rectal control, and with diaphragmatic myoclonic spasms. Coming out of her coma, she had periods of almost maniacal agitation, in which state she was received for observation. In these periods she was beside herself, spit in all directions, and at times stuffed her feces in her mouth, urinated in her mouth, and was coprolalic. (Compare with so-called "degeneracy" symptoms, obscenities, etc., of Case I of Jelliffe.) These crises would clear up and the patient, apart from a marked emotivity, seemed quite clear. By January, 1921, most of the severe visceral regression symptoms had cleared up. She also showed an almost continuous sniffing, which would advance to a marked degree of forced and blowing expirations, with much nasal mucus and much hawking. She was sent to St. Anne.

Case 61, p. 273. A girl of eleven who, in February, 1920, had a short period of hallucinatory delirium apparently (?) related to some ear infection. Temperature, lethargy for a month followed. After this (meningitis—typhoid?) she recovered, with feebleness and with occasional attacks of generalized trembling. In July, sleep and character alterations appeared and she began to make capricious grimaces and eye movements. Then tachypneic difficulties arose. She also had hiccough and yawning attacks. By October, 1921, the paroxysmal tachypnea was pronounced.

Case 62, p. 274. Insomnic and hypomanic type in a ten-year-old boy previously healthy. On February 19, 1920, the boy vomited his breakfast and complained of pains in the abdomen. Nevertheless he went to school until the 21st. He was unable to sleep that night or the next day. His grandmother died at this time, to which event the child referred his troubles. On the night of the 22d he became delirious, saw wild beasts, and began a hiccough which lasted intermittently all night. Next day he was calm but complained of headaches, pain in the limbs, and had no appetite. He got up on the 23d but from this time on was unable to sleep at night. He would walk around at night, cry out, "Thieves; I am dying; I want to die"; would open the windows, see the faces of men, hear their noises and voices. During the day he would sleep twelve to fourteen hours. During his stay at the Salpêtrière, beginning in July, 1920, the night terrors persisted. One night he tried to cut himself with a broken bottle. By September he had improved greatly; slept during the night and in daytime until noon. During the day he would play with other children but had the habit of continually blowing at objects. In October he left the hospital but the blowing tic still continued. In February, 1921, he reëntered the hospital because of his naughtiness. He would strike others and break the windows, etc. He blew at objects, or would spit on the ground or at the people. When reprimanded he would say nothing and continue to puff. In June, 1921, he had atonic convulsion and next morning he had puffing attacks with dyspnea. Inspiration and expiration were greatly accelerated; nasal expiration. This respira-

tory crisis lasted several minutes and he was very much exhausted after it, sleeping through the examination of the physician. His respiratory crises continued, although there were no more convulsive attacks. One day he climbed a tree and urinated upon the heads of the patients in the courtyard. He was then sent to St. Anne and later permanently interned at Vacluse. His intelligence apparently was intact, although he was only mentally at a six-year-old level. He continued to puff at objects and frequently into his hands, as if it were a musical instrument (cornet). He rolled his tongue around in his mouth, would strike his knees with his fists in crises, and had typical tachypneic attacks. After two years the condition remained as described.

Case 63, p. 275. A short and wittingly incomplete account of a nine-year-old boy who in March, 1920, had several nights of insomnia, delirium, then diplopia and strabismus. He was in bed three weeks, sleeping most of the day and agitated most of the night time. By May he talked all night and walked around. During the day he slept. He became irascible and had crises of tachypnea with symptoms of respiratory distress. He complained of unpleasant scraping sensations in his throat. His mental condition demanded interning.

Case 64, p. 276. A thirteen-year-old girl with hypomanic and respiratory difficulties. In October, 1919, patient had a jaundice with fever, headache, and vomiting, and was confined to bed for eight days. In November she went to school but was always tired and had a headache. In January, 1920, on returning from school, she became excited, began to sing, and could not sleep during the night. She then had choreic movements and was delirious. A lethargic period followed. By February she could sit up. She had involuntary jerky movements, right side. By April she began to hawk, and then had whooping cough-like attacks. Then increased salivation and spitting took place with the increased coughing and she was diagnosed a "neuropath." She had lost all interest in everything. By June, 1921, she began to spit at everything and everybody. "It was too much for her," she said. In August, 1921, rude speech began and tachypnea was pronounced. They were by January, 1922, 35 to the minute. There was much irregularity in the respirations, in which a period of tachypnea would be followed by a period of apnea of a few seconds, followed by a deep superficial inspiration, then a new expiration like a sob. The child cries, "I suffocate, I suffocate; I cannot breathe," after which she yawns abundantly as if one hungered for air. She is quite intelligent in her answers during all this. She laughs and cries alternately. She had a rapid pulse. (Pneumograph figure 32.)

Case 65, p. 278. A twenty-year-old girl. On January 5, 1920, she had an attack of encephalitis with delirium lasting two days, with some electric-like jerky attacks in arms and legs. She was in bed three weeks.

agitated and sleepless. She appeared well, but two weeks later she began to vomit. Every evening, after dinner, without pain and without nausea, she would begin to vomit. Later she could dance all the evening. This evening single vomiting spell lasted about six minutes. She then had a compulsory feeling she had to go to the toilet. "It is too strong for me," she would state. She would go, stay there half an hour, and without diarrhea or sometimes no movement, nevertheless felt the urge. At night she felt no such urge, but slept badly or none at all. By November, 1920, this situation had cleared up, but she then began to puff, slightly at first and intermittently until it became excessive, and in February, 1922, two years after the initial delirium, came to the Salpêtrière seeking relief for her tachypneic attacks.

In the course of a month after the blowing began the respiratory difficulties became constant day and night, although the night sessions were intermittent. This respiratory situation ceases when the patient is much interested in some external situation. She states to her attendants she "feels wicked" inside—wants to throw everything in the fire—but the nurses say she is well behaved but seems to have a strong tendency to rummage about into things. She wants to eat and drink all of the time, night and day. She has buzzing in the ears only at night.

The tachypnea involves chiefly the costal and the upper accessory muscles. Graphic examination shows (1) strongly accelerated and ample respirations; (2) apparent conservation of rhythm of expiration and inspiration; (3) the reappearance of a normal respiratory rhythm at times even retarded and presenting true pauses upon performing an act such as writing, sewing, which requires continuous attention.

Short discussion as to the differentiation from pithiatism.

Case 67, p. 282. Girl, aged fourteen and one-half years, who on March 4, 1920, complained of a frontal headache and inability to sleep, with a slight fever. She remained in bed two weeks, sleeping all day but unable to sleep at night. Diplopia on the fourth to fifth day of her illness. After two weeks she got up but felt weak. About April 1st she had a weakness in the face, the mouth being drawn towards the left. At this time every evening about 5 o'clock she began to make grimaces with the eyes and the mouth and began to talk to herself, a slight tendency towards which was present during the day. She began to grow impatient, irritable, and sad. She lost twenty-five pounds in weight. She entered the Salpêtrière in January, 1921, because of an intractable insomnia and nocturnal agitated crises. She then had a mild parkinsonism. In July, 1921, she began to have tickling sensations in the throat and convulsive respiratory cough-like attacks, resembling whooping cough. She also had polydipsia and polyuria. This whooping-like respiratory disturbance came on eighteen months after the initial symptoms, and had persisted nine months at the time of this report.

Case 68, p. 283. An eighteen-year-old boy who came to the Salpêtrière for insomnia, dyspnea, and agitation. He had had an attack of encephalitis in March, 1922. It had begun with insomnia, agitation, and an hallucinatory delirium which had lasted a week. He saw Napoleon, had a diplopia and ptosis, and was lethargic for about six weeks. He then recovered, with slight feelings of sleepiness. About the end of June he began to be agitated towards evening—6:30-7:00—and began to breathe differently. He stated that "he felt the need for some change, and to breathe like that, otherwise it would seem as if he would fall to the ground and suffocate." A painful heavy sensation lasting for a moment would be felt in the heart, in the back. He yawned frequently. Could not sleep. At times he had the impression the air would come as high as his nose. These breathing attacks were characterized by their great slowness—12-15-17 to the minute. There are distinct apneic periods during these bradypneic inspirations lasting six to seven seconds. During the deep inspiratory phase all of the accessory muscles enter into activity and then six or seven of the deep inspirations occur in a minute, the intermediary respiratory movements being almost imperceptible. The diaphragmatic movements were uninvolved, save at times a very short, brief spasmodic contraction would take place, independent of the chest movements. No cyanosis. Polydipsia, polyuria, polyphagia, all were marked.

Wigert² reports the case of a child of eleven years. Lethargic initial phase, January, 1921. Afterwards various respiratory troubles: (1) Continuous coughing, eventually ending in fits with tonic spasms, cessation of breathing, opisthotonos. (2) These symptoms having lasted for some time, they changed into fits of sneezing, in spells, by day or by night, often heaps of fits in the same day, lasting each a quarter of an hour or half an hour, very noisy, she standing a little bent forward. No loss of consciousness. Then (3), some time later, some other peculiar respiratory symptoms occurred: She would stiffen in apnoe for quite a long time, stretching the whole body, emitting guttural sounds, or clasping her hands together, shaking her garments, etc.

During 1922 she had three or four epileptic seizures (no Jackson type) with loss of consciousness.

Possibly there was a slight hypokinetic component, a certain degree of amimia, and sluggishness of movements. Psychically, she was bright; no true "hysterical" characteristics.

Parker's³ paper reports eight cases, mostly related to the acute attack, but are of sufficient importance to be included in this summary.

² Wigert. 2. Interscandinavian Psychiatric Congress, Report of. Stockholm, 1922, p. 69. Kindness of Professor Wimmer.

³ Parker, H. L. Disturbances of Respiratory Rhythm in Children. Sequela to Epidemic Encephalitis. *Am. Arch. of N. & P.*, VIII, 1922, 630.

Case 1 is evidently a post-encephalitic case in which there were, in January, 1920, neuritic pains, insomnia, polyuria, polydipsia, myoclonic jerkings, and a right-sided rigidity in a fourteen-year-old boy. Seventeen months later he developed typical grunting, expiratory breathing attacks, with marked forced movements in which he doubles up, places the head between the knees, and bends backward, with protuberant abdomen. In the "early morning stretch" or yawn phase he holds his breath for twenty seconds, then bends forward and releases his breath in a series of coughing grunts. There was no improvements in his condition.

Case 2. A girl of twelve had "influenza" in March, 1920, with high temperature, malaise, and headache. Insomnia, choreiform movements, and she became impulsive, stubborn, and disobedient. She was slowed up in her mental actions. Early in 1921 she began to breathe noisily and then had periods of holding her breath with her head thrown back. Later she would lose consciousness in an attack. The attacks were more frequent at night.

Case 3. A girl two years and ten months old had attacks of holding her breath and grunting like *Case 1*.

Case 4. A boy of twelve. January, 1920, he had had an "influenza." Five months later he developed breathing attacks of holding his breath more or less like 1 and 3.

Case 5. A boy of ten with breath holding attacks and an epileptic convulsion. After a tonsillectomy he was worse.

Case 6. A six-year-old boy who, following a restless night in January, 1920, had a cold; had high temperature a few days and then it was noted he had a change of disposition. He sang and whistled all night and slept little. He also showed breath holding and noisy breathing. He had attacks of unconsciousness. He was noisy, restless, and aggressive; would get into tantrums, be abusive, use bad language, attacking nurses and doctors with his fists and feet.

Case 7. A woman twenty years of age. In February, 1920, an "influenza" with fever, diplopia, lethargy, and blurred vision. She had great sleepiness. When standing her respiration was 30 to 40, pulse very rapid; her face would become flushed. She had a parkinsonian habitus and tremor.

Case 8. Four-year-old girl; influenza in 1919, with breathing attacks later developing an imbecility.

Parker speaks of the apneic as holding the breath, and does not say whether these patients developed trance states, as Jelliffe's patient I did. The author states some effort was made to investigate the psychological mechanisms, but he does not get beneath the manifest level and talks of "stern discipline" but "they found out their mistake," and went no further save for ineffectual hypnotism.

Leroy⁴ reports some cases:

Case 2. A post-encephalitic parkinsonian who developed rapid breathing attacks and myoclonic attacks in the arm. She has slight confusional attacks.

Case 4. With left-sided post-encephalitic parkinsonian attack with paroxysmal rapid breathing.

Vincent and Bernard⁵ in a society report speak of acute and chronic phases with respiratory difficulties in 28-, 12-, 21-, 31-, 34-, and 48-year-olds, respectively—not of service in our study—*fixation of chest idea*.

Roubinovitch, Baruk and Bariety⁶ report to a society a boy fifteen years of age with an attack of encephalitis in March, 1920. In November, 1922, he showed character modifications, was quarrelsome, disobedient, wicked. He had rapid breathing attacks which were associated as in Case J, here reported with phases of inhibition of all activity. There was a mild parkinsonism.

At this same time **Robin**⁷ reports a boy of thirteen, naughty, turbulent, impulsive, with a tendency to embrace and kiss people. Had a paroxysmal polypnea, with afternoon and evening crises, crying aloud, biting the lips, and vertigo during apneic periods. Strong oculocardiac reflex.

At the November 9 meeting of the Paris Neurological Society **Babinski and Charpentier**⁸ report some cases.

Case 1. Young woman, twenty-seven years of age, who had an attack of encephalitis in March, 1919. In May, on resuming her work, mild parkinsonism appeared. On going to bed at night she also had difficulty in breathing. In May, 1921, after an uncomplicated childbirth, the respiratory difficulties increased. At the moment of inspiration the nares are pinched in and expiration is loud and violent. At times there is rapid breathing, but more often it is slow, even to six per minute. When so marked there is frequently a spasmodic state which interrupts the breathing several seconds, followed by a noisy expiration as though she would blow out a candle with her nose. She says she can control it a little. Respiration is normal during sleep.

⁴ Leroy, Alph. Polypnée paroxystique ou permanente. Toux paroxystique: Aphasie paradoxicale. Symptomes d'Éncephalite. Bull. de la Soc. de Med. Mentale de Belgique, Oct., Dec., 1922, No. 194, 195.

⁵ Vincent, Ch., and Bernard, Ch. Troubles respiratoires dans l'Éncephalite Épidémique. Soc. des. Hôp.: Bull. et Mem., XXXVIII, 1922, 1111.

⁶ Roubinovitch, Baruk et Bariety. Un cas de troubles psychique et respiratoires consecutifs a l'Éncephalite épidémique. L'Encephale, XVII, 1922, 659, November.

⁷ Robin, M. G. Troubles mentaux consecutives a l'Éncephalite léthargique chez les enfants. Troubles mentaux et troubles respiratoires. L'Encephale, XVII, 1922, 660, November.

⁸ Babinski, J., et Charpentier, Al. Syndrome Parkinsonien fruste post-encéphalitique. Troubles respiratoires. Rev. Neurol., 1922, XXXVIII, 369. Seance de Nov. 9, 1922.

Case 2. Young man of eighteen; encephalitis in February, 1920; in bed two months. At the end of the year he had to leave school. He had rapid and noisy breathing in the morning and at night. He sniffled. In 1921 he had to leave school again because of the respiratory troubles, and he fell asleep almost constantly. His character underwent a gradual change. He developed a mild parkinsonism and had attacks of irregular rapid and puffing breathing.

The first patient could partly control her attacks, and by the well known faradic device the attacks could be mitigated. The authors thus speak of hysterical-organic combinations.

In the discussion of this presentation **Souques** details a related observation and also spoke of a patient who, although able to control similar breathing difficulties, yet nevertheless died five days later of her encephalitis, and **Vincent** states that most of the post-encephalitis parkinsonians have respiratory difficulties of various types, but mostly of the paroxysmal tachypneic type.

Also in the discussion of Babinski and Charpentier's paper, November 9, 1922, **Bouttier**⁹ adds a short clinical statement of a tachypnea case in a fifteen-year-old boy for whom he tried the old fashioned brutality method of painful electrical treatment. For forty-eight hours they thought they had cured the patient, but the symptoms returned and continued to evolve.

Reys¹ details an interesting case, analogous to our case II under the head of spasmodic cough.

In the course of a very grave myoclonic type the diaphragmatic myoclonia brought about very brusque expirations of extreme frequency which continuing day and night interfered with the patient's sleep. This situation was present in the acute phase and continued during the entire convalescence. The patient recovered from all his ocular and other myoclonic muscular movements but continued the breathing anomalies for at least two years. During the later phases parkinsonism developed. The extreme breathing seemed to be purely thoracic. The patient seemed to be always *essoufflé*.

The mouth was held half open, the tongue dry, the effort at breathing dispneic and difficult as if the patient were out of breath. Radiographic study showed good diaphragmatic movements but diminished in their amplitude and increased in their rhythm. There was no paralysis of the diaphragm from phrenic involvement and the author attributed the changes to some central involvement.

Another type observed by Reys showed a diminution in the amplitude of respiration and an augmentation of its frequency. There were great inspirations followed by ample expirations at variable intervals.

⁹ Bouttier. *Rev. Neur.*, XXXVIII, 1922, 1376.

¹ Reys, L. *L'Éncephalite épidémique*. Maloine, Paris, 1922.

Yawning movements took place several times a minute. Reys is inclined to explain these anomalies not by implication of the respiratory pathways themselves but would run them back to bulbar implications. He promises further chemical studies.

During 1923 the studies continued to appear. In January, E. Bernard¹ gives us a general review of the respiratory troubles occurring in lethargic encephalitis. It concerns itself chiefly with the thoracic mechanisms and mostly with the polymorphous types seen in acute cases. His review so far as the chronic types is concerned is confined to the reports of Marinesco, Bériel, Babinski et Charpentier, Hardoin, Marie, Binet et Lévy, Souques, Vincent, and Bernard, whose case reports have already here been summarized.

The newer studies are those of Hagelstam, Runge, Francioni (second communication), Negro, Roch, Schmidt, Chiray et Lafourcade, Fiamberti, de Saussure, Leroy et Montassut, Ballif, Ballif et Marz, Urechia et Mihalescu, Buzzard, Hinds-Howell, and Symonds.

Hagelstam² draws upon his experience in the epidemic in Finland from the Helsingfors Marien Hospital of 1920-21, where he observed some ninety cases with a mortality of 16 per cent. He here reports four histories only in which the neurotic component offered certain interesting nosological difficulties. Cases 1 and 2 only of interest for this discussion.

Case 1 was a ten-year-old boy seen in February, 1922, who had had a typical encephalitis attack in November, 1920. Some few weeks after his apparent recovery he commenced to hawk mucus from his throat. After a *tonsillectomy* this ceased, but he then began to have snorting and sniffing attacks, although there was little or no secretion in the nose. He then developed laryngeal coughing attacks, which lasted all the summer of 1921, and he breathed as though he had asthma. In these attacks, which came on frequently, he would have deep inspirations and deep expirations with much salivation and shivering tremors. He would cry and complain of great fatigue and also say he was hungry and thirsty (compare shivering attacks of Jelliffe's case early in his respiratory crises and great thirst). During the attack the patient is completely possessed by the process and seems neither to see nor hear anything going on about him. He does not answer and his character has become more selfish and unresponsive to control. Strong disciplinary control in the hospital reduced the number of attacks, but they recurred as soon as he returned home.

Case 2. A seventeen-year-old acute case of encephalitis with respiratory disturbances. Not of interest in this discussion.

¹ Gazette des Hôpitaux, XCVI, 1923, 84, January 20.

² Hagelstam, J. Postencefalitiska Neuroser. Finska Lakares Handlingen, LXV, 1923, 69, January, February.

Winther³ reports two children, eight years old, infection two and three years ago, respectively. Persisting mental excitement, disturbances of sleep, moral defects, etc. Tics: Sniffing, groaning, in the one child occurring in paroxysms, the patient resembling a person who has run a long way.

Runge⁴ has given us the most detailed and thoroughly worked out individual case in the literature. It concerns a young theological student of twenty years of age who was somewhat delicate (effeminate), physically and psychically, who developed a protracted "grip" eighteen months previously. After this there developed very slowly a mild akinetic-hyper-tonic motility syndrome, with slight rigidity of the arms and body. He had definite aboulia, apathy, lack of initiative, reversal of sleep formula and mental changes so frequently found.

He had, moreover, paroxysms of rapid and deep breathing which, according to one version, had begun about one year after his first attack of grip, according to another earlier. These breathing efforts were accompanied by marked puffing and he had lost a position as an instructor because of them. He went through a disappointing love affair and then the breathing attacks became more severe, and during them he would make serious efforts to choke himself in a great effort towards getting some sensation by pushing both of his fists just beneath the larynx. He would thus become pale from cutting off his breath. On being restrained the breathing was deep and rapid and he would puff through his nose. (Our Case I made similar nose puffings.) This performance would be repeated maybe fifty times an hour.

Asked why he wished to choke himself, he says "he has an instinctive feeling he must do it." "He does it without his willing to do it." His earliest effort at choking was carried out by means of a handkerchief, and during the effort he experienced a voluptuous feeling accompanied by giddiness. There seems to be a reciprocal relation between breathing attacks and choking efforts. If the former are stronger the latter are less determined. The heavy breathing attacks almost result in the same voluptuous sensation. In the choking efforts he arrives at a kind of orgasm to reach which all external or internal bonds must be broken. (See later the rôle played by J. in I's dreams.) Hypnotic treatment for a year. Some definite betterment and the general uncovering of a masturbatory compulsion.

The patient also had, like Jelliffe's case, tetany-like spasms. (See also Barker and Sprunt's case, which Runge has overlooked.)

³ Winther. Proc. Neurol. Soc., Copenhagen, May 27, 1923. Kindness of Professor Wimmer.

⁴ Runge. Psychopathie und chronische Encephalitis Epidemica mit eigenartige Symptomatologie (Larvierte Onanie). Archiv f. Psychiatrie, LXVIII, 1923, 429, January.

The details brought out by the hypnosis will be dealt with more in detail in discussing etiological factors. Runge's case is of great interest in connection with Jelliffe's cases and those of Witzels, but one gets no light on the situation by Runge's use of the conception, psychopathic, behind which fiction label he does not go. Everyone is latently "psychopathic" if the upper level discharge mechanisms are removed by no matter what process. The "lust" in war, for instance, is not confined to "psychopaths." "War" is the symbol of the uncovering lesion and the causation of the regression, but of this general situation more later.

In a second communication of **Francioni's**⁵ the author discusses the physiopathology of these respiratory attacks and adds a new case of a boy of eighteen affected with encephalitis in January, 1921. Several months after an apparent cure he began to have respiratory attacks with vasomotor disturbances and oscillations of great anxiety, during one of which he attempted suicide. (See Runge's case also.) He had a definite parkinsonian status. The respiratory attack lasted on the average one to two minutes. He would get red in the face, open the mouth, stick out the tongue, breathe noisily, and develop to a great state of unrest and painful sense of constriction, as if he would die of suffocation. The pneumograph showed two types of respiration.

Negro⁶ cites the clinical history of a patient with typical parkinsonian syndrome and respiratory crises which occurred during the night. This patient was tranquil during the day time but in the night became agitated and disquieted. She would go in and out of a room incessantly. During the day the respirations were tranquil and regular, mounted up to thirty to forty a minute during the night, the mouth half open. This state of excitement would mount almost to that of a delirium. The respirations would mount to seventy or eighty to the minute, arrhythmic, with periods of suffocation. These paroxysms repeat themselves every twenty to thirty minutes, last forty to fifty seconds or more, the pulse becoming small, frequent, irregular; the extremities cold, cyanotic. In the early hours of the morning the respirations gradually come down to normal.

Calls attention to Bériel's paper *re* hysterical nature of this syndrome, but makes irrelevant remarks that electrical treatments had no effect (p. 179).

Short report of case by **Roch**⁷ seen in 1922, more completely reported

⁵ Francioni, G. Ancora sopra le alterazione del respiro nella encefalite epidemica. Patogenesi e rapporto con le crisi emotivi. *Il Cervello*, II, 1923.

⁶ Negro, Fedele. Fisiopatologia delle sindromi Parkinsoniane. Torino, 1923, p. 178.

⁷ Roch, M. Les Troubles respiratoires dans l'encephalite épidémique. *Rev. Med. de la Suisse Rom.*, XLIII, 1923, 129.

in a Geneva thesis. A young man, two years of age, with parkinsonism, apathy, and aboulia, with paroxysmal dyspneic attacks causing him to retire to a corner, anxious and cyanosed, with open mouth, thus enabling him to make a series of rapid and noisy respirations lasting a minute or so. In his worst periods these occur every hour. The patient can control them and they can be modified by distraction. No treatment was available.

Pierre Schmidt studied this case in detail and incorporated it into a thesis⁸ in which he gives short résumés of some of the material here cited.

*Case 5, by Chiray et Lafourcade.*⁹ Sixteen and one-half years old; had typical lethargic encephalitis in 1919 (Netter). November, 1922, enters Hotel Dieu with paroxysmal respiratory attacks and obesity (p. 42). His first attack was apparently determined by a very serious discussion. It was preceded by a period of loss of consciousness. The first dyspneic crisis lasted half an hour and terminated by repeated yawnings. A second attack a week later, following a controversy. The attacks then became more and more frequent until they occurred daily and then five and six a day—maybe ten. A depressing idea or a contradiction may be sufficient to start one. The onset is abrupt and they last about ten minutes. The polypnea mounts to sixty to eighty-five a minute, holds this rate for several minutes and then comes down. No cyanosis and no palpitation. The rhythm may be diverted but only for a time. The diaphragm seemed to be fixed at the margins but free in the center, and this was the mechanical substratum of the polypnea. Loss of memory and adiposity were striking accompaniments.

An interesting case history by **Fiamberti**¹ of a typical post-encephalitic respiratory sequel with recovery, and discussion of the outcome of certain post-encephalitic sequels. This latter is not of interest for the purposes of this presentation although of much importance in the general discussion. The author is conversant with most of the work on these respiratory sequels. His patient, twelve years old, a girl, had an encephalitis in December, 1919, with day sleep and night wakefulness. Slowly began to develop changes in character and in respiration. She was first seen in March, 1922, when she looked like a typical parkinsonian sine tremor. He classes his patient using Francioni's (Laignel-Lavastine's) bulbo-vagohypertonic terminological description.

The pneumographic tracing of her attack shows rapid breathing, thirty to minute, for about thirty seconds, then an apneic phase, fifteen to

⁸ No. 1077: Thèse de Geneve. Contribution a l'étude des phénomènes Respiratoires de L'Encéphalite Léthargique. Jan. 19, 1923.

⁹ Chiray et Lafourcade. Encephalite épidémique ou séquelles combinées, respiratoires, bradytrophiques et psychiques. Bull. et Mém. Soc. med. d Hôp., XLVII, 1923, 406.

¹ Fiamberti, A. M. Encefalite epidemici cronica, a tipo respiratorio, con esito in quarigione. Note e Riviste di Psichiatria, XI, 1923, 363.

twenty seconds, then hasty breathing, etc. During the attack the patient has an anxious suffocating feeling. She may be sitting or semi-dozing upon a stool or chair when she suddenly rises to an erect position and makes strong inspiratory efforts in which she bends forward (compare opposite opisthotonos positions of other cases) almost double, in great anxiety, salivates; remains in this bent-over position almost touching the floor. She stays in this position a few seconds to half a minute, impervious to stimuli, during which time the eyes are closed, the salivation is more intense, the face is weepy, reddened as if by bloody stasis. The pulse is arrhythmic. The patient then straightens herself out brusquely and, carrying her hand to her throat, makes a forced effort of expiration; these are repeated in a rapid series, when the patient sinks into a heavy exhausted sleep. At times in the expiratory stage the patient may discharge her urine or feces. She is conscious. After a paratyphoid attack in February 16 to February 20, 1923, the patient suddenly ceased to have her respiratory attacks and little by little she made a complete recovery (remissions as in paresis?).

De Saussure's² case is partly relevant for this discussion since it bears particularly upon the psychogenic components. The patient, a young woman of twenty, developed a marked spasmodic tic of the masticatory muscles May, 1921, after an illness which was suspicious of an encephalitis in February, 1920, a terrifying nightmare ushering in the performance. "She had seen a dead woman who was looking at her from behind the window." As the expression of a death-wish directed against an irritating grandmother, this is of note. During the spasm, respiration stops, then there is a short period of rapid breathing in which the excursions are more ample, at first rapid, then slow. The spasmodic attacks come on apparently as a defense against a persistent yawning which at first lasted about fifteen days and recurs at intervals, which when persisting give rise to the spasms and polypnea which is accompanied by great thirst. She later had periods of compulsory use of vulgar language, coprolalia (Gilles de la Tourette's disease of former years). She also had a definite intellectual reduction and could not give spontaneous associations in psychoanalysis.

Case report by **Leroy and Montassut**:³

C. M., twenty years old; had encephalitis September, 1921, retrospective diagnosis. February, 1922, much intellectual retardation, character changes, respiratory activity preceded by yawning; sent to Maison Blanche asylum. The respiratory attacks invariably influenced by emotion. It

² de Saussure, R. Discussion sur l'étiologie d'un tic survenu quinze mois après une Encéphalite léthargique atypique. Arch. Suisse de Neurol. et de Psychiatrie, XII, 1923, 298, July.

³ Leroy et Montassut. Tics respiratoires et troubles mentaux au cours d'une encéphalite épidémique fruste. De la puerilité encéphalitique. Ann. med. Psych., LXXXI, 1923, 48.

was of Type 1 of Marie and Lévi's paroxysmal polynea without cyanosis or anxiety. Superior costal, diaphragmatic inertia.

Ballif⁴ reports briefly three cases of respiratory difficulties as post-encephalitic resultants:

Case 1. He first entered the psychiatric service of Parhon at Jassy because of a great restlessness, irritability, and quarrelsomeness that made it impossible for his parents to control him at home. For causes unknown from time to time he would commence to breathe rapidly and noisily, would put his hands up to his mouth as though they were a cornet to blow, and then after a long respiration the attack would cease to recur within a few minutes or a few hours. The patient himself said he could not help it, an interior need was stronger than he. The author, not then aware of this strange performance as a post-encephalitic resultant, classed the patient as an hysterical or a beginning dementia precox.

Similarly his *second case*, a girl of twenty years, brought to the clinic for hysterical crises and respiratory troubles. She had suddenly undergone a change in character and had five to fifteen respiratory attacks a day. Sometimes they would be almost continuous for three to four hours. After them she would be exhausted. Some days she might be free from the attacks. Her breathing was quite irregular. It would be rapid, deep, and noisy; this would last two to three minutes; then it would be interrupted and mount again rapidly (pneumographic tracing) (Cheyne-Stokes type). Her eyes would be closed, head turned back (see Parker illustrations), an opisthotonos position be assumed, her head and heels alone on the bed. She would become cyanotic, pulse 90-120 to minute; then she would sink down exhausted. The attacks might persist five to eight minutes. During sleep she was free. Diagnosed pithiatism, treatment along lines of suggestion or drug therapy were unavailing.

Case 3, a fourteen-year-old boy, was interned because of his bizarre conduct. His respirations were wide, deep, noisy, and rapid, forty to the minute (pneumograph). They were accompanied by much psychomotor activity; he would clap his hands, make choreiform mouth grimaces, imitate the words and gestures of those about him, and was quarrelsome. A typical noctambulatory patient. Catatonic attitude, mask-like face, and so typical of the parkinsonian sequel of encephalitis that the two preceding cases were reviewed in the light of this one—thus considered post-encephalitic respiratory residuals.

Ballif and Marza⁵ return to the same subject already presented by Ballif at a preceding meeting of the Roumanian psychiatric society (see

⁴ Ballif, L. Tachypnée hystérique ou tachypnée post éncephalitique. Bull. de L'Assoc. Psychiatres Roumainis, IV, 1923, 96.

⁵ Ballif, L., et Marza, V. Troubles respiratoires et mentaux sequelles d'encephalite lethargique chez les enfants. Bull. Assoc. de Psychiatrie Roumainis, V, 1923, 113.

previous abstract). Additional cases are presented, the accent chiefly being laid upon the mental changes.

Case 1. Post-encephalitic character changes, irritable, turbulent, disobedient, and insulting, and abusive to those about her. The respiratory crisis begins with rapid deep breathing; the head is thrown back, the eyes become staring, and then breathing stops for 3 to 100 seconds; the lips and face become cyanotic. Athetotic movements of the hands sometimes accompany the apneic phase. The respiration recommencing, she runs about, beating with the hands, and would murder those she might encounter. The urinary urge is strong and she will even urinate on the ground. When over her attack, she is sorry, apologizes, cries, says it is too strong for her and can't help it (pneumograph).

Case 2. Briefly cited, a girl of eleven, with agitation, polypnea, beating of hands, violence and mendacity towards her environment. Only under observation a week.

Case 3. A girl of fourteen, entered as epileptic since four years previously, when she probably had an attack of encephalitis with fever, delirium, insomnia. Her attacks are peculiar. She takes her head in her hands, falls to the ground or plunges her head against the ground or a wall. She has choreiform movements. The lips and face are cyanotic and she has typical rapid breathing spells, thirty to forty to the minute. She is very violent and would viciously assault her companions. She has frequent absences.

The case history is worthy of further elucidation, since it brings up quite forcibly the nature of "names" or "diagnoses," or "diseases" in medicine as logical fictions (see Vaihinger, "Philosophy of the As If"), a feature which is in constant need of iteration, since "names" are so frequently thought of in medicine instead of the "behavior of things."

Case 4. A twelve-year-old boy who went through an encephalitis attack. The respiratory tracing shown indicates very irregular and rapid breathing—Cheyne-Stokes in general character.

Urechia and Mihalescu⁶ report the case of a girl nine years of age. Three years previously child had a chorea which was followed by changes in character, indifference, disobedience, obscene proposals, insomnia, and psychomotor agitations. There was arrhythmia of the pulse, 60-96; more or less synchronous with respiratory disturbances. These were paroxysmal in their nature. With their onset the patient would bend forward or backward extremely and brusquely. If lying down she would stand up immediately and remain immobile. A period of apnea then comes on, during which the jugular veins are dilated, the pulse filiform and arrhythmic. Towards the end of the attack one observes slight

⁶ Urechia, C. I., et Mihalescu, S. Troubles de la Respiration, du Sommal et du Caractere chez une fillette de neuf ans, avec éncephalite. Bull. et Mém. Soc. des Hôp., XLVII, 1923, 210.

wheezing and a blowing respiratory noise. A period of polypnea then supervenes. These attacks last several minutes, and are not attended by unconsciousness.

Buzzard,⁷ in opening a discussion on the sequelae, speaking of respiratory disorders, says:

“Various disorders in the nervous mechanism of respiration have been recorded in the literature of encephalitis. One of my patients, a young subject with a progressive parkinsonian syndrome, complained of shortness of breath which came on in attacks for no apparent reason. Under observation it appeared to me that from time to time involuntary respiration was replaced by voluntary and exaggerated breathing, but whether this was induced by failure of the involuntary mechanism it was impossible to determine.

In this same discussion led by Buzzard **Hinds-Howell**⁸ says: “Peculiarities of respiration had been noted in 3 cases. In one, that of a girl aged twenty, about three months after the acute illness there developed an attack of dyspnea which lasted for about three weeks; she improved for a few weeks and then remained much as before; her respirations were 36 per minute, the pulse rate 80; these respiratory troubles had now ceased and the girl was in active employment, quite recovered. A second case exhibited a type of respiration which, although not of the true Cheyne-Stokes type, at times seemed to approximate to it, while the third had developed a most peculiar respiratory tic, in which the mouth was opened widely and usually towards one side and the platysma on that side thrown into contraction. There was no gasping inspiration accompanying this movement, but the patient said he did it in order to get his breath. He had no dyspnea and his respiratory rate was normal.”

In this discussion led by Buzzard, **Symonds**⁹ notes: Dr. Hinds-Howell had mentioned that in one of his cases there occurred gasping movements over which the patient had voluntary control. Dr. Symonds had met with cases in which the patient had made movements of a similar nature, and had explained them as being due to a sensation of impeded respiration and suffocation of which he had tried to rid himself by energetic deep breathing. Another instance of that type had been a man who had a perpetual sensation of nasal obstruction which impelled him to be constantly blowing and sniffing.

⁷ Buzzard, E. F. Sequelae of Lethargic Encephalitis. Br. Med. Jl., Dec. 8, 1923, 1083.

⁸ Hinds-Howell, C. M. Sequelae of Lethargic Encephalitis. Br. Med. Jl., Dec. 23, 1923, p. 1086.

⁹ Symonds, C. P. Sequelae of Lethargic Encephalitis. Br. Med. Jl., Dec. 8, 1923, p. 1089.

In 1924, Mlle. Lévy's Paris thesis, reëdited, contains the most interesting material; Wimmer's monograph also gives us a résumé but the clinical details are relatively scanty.

Van Bogaert and Sanz report cases. Rosenow's experimental studies on some of Parker's material might be mentioned here, also Novarro's short note, Motzfeldt's case, and the six cases of Suckow. Adlersberg and Porges' study on a new type of neurotic breathing tetany also belongs to this year's contributions. These are all I have found directly pertinent to our subject.

Wimmer¹ in his most fascinating monograph has paid particular attention to these respiratory syndromes and has given one of the best discussions extant. He notes their frequent occurrence in acute encephalitis but devotes special attention to the chronic form constituting, as he says, often a very grotesque "hysteriform" type, maybe occurring with parkinsonism or with other complex symptoms. He notes their monosymptomatic appearance as well and quotes a number of the others here cited, following in general Marie and Lévy in their classification. With him polypnea is of most frequent occurrence and the attacks last variable lengths of time. With him bradypnea is more rare and is also phasic in its type.

Respiratory tics, such as sniffing, hawking, spitting, noisy puffing, or hissing or snorting through the nose or through the mouth have also been observed by him.

He says (page 71) "the peculiar grotesque pictures afforded by these respiratory disorders, their coincidence with psychotic, general nervous, 'hysteriform' or 'neurastheniform' troubles, their being 'punctual to the hour,' their liability to being influenced by psychic factors, and finally their frequent monosymptomatic appearance, at any rate for a time, all these features may delude one into conceiving them as purely hysterical. Semiologically, too, they often show a considerable resemblance to the respiratory disturbances found in true hysteria. A psychogenic blending cannot, of course, be totally disregarded, especially inasmuch as the initial and purely organogenic attack may, during its further development, become tainted by reactive anxiety symptoms."

Respiratory troubles in his patients are more moderate. Serial yawning or sighing (Case 8), sighing and hiccoughing with or without abdominal myoclonia (Case 41), awakening with polypnea and being out of breath as if the patient had run upstairs to the 4th floor (Case 55). In Case 4, periodic bradypnea was very striking. In Case 11, the tachypneic attacks came on during the night, with trumpeting sounds, a laryngoscopic examination revealed a tremor of the soft palate and

¹ Wimmer, Aug. Chronic Epidemic Encephalitis. Heinemann, London, 1924.

vocal cords. "In the patient mentioned as Case 46, the respiratory disturbances (tachypnea, arhythmia) accompanied the exacerbations of muscular unrest. Also at times when there were no actual attacks—and when the respiratory type was not changed to any essential degree—the stethoscopic examination revealed a markedly saccadé respiration, suggesting a diaphragmatic spasm, or the like, as demonstrated by means of the radiogram by Vincent and Bernard, and Laignel-Lavastine and Maginot, in their cases."

"A small girl under my observation, who did not show any other morbid signs than disorders of sleep, had a respiratory tic consisting in a persisting blowing upon her fingers, as though they were numbed by cold."

"Case 12, a girl of eighteen years, admitted to my department November 28, 1923, and who is still under my care, shows respiratory troubles of a more peculiar kind, for a time manifesting themselves mostly as paroxysmal yawning, as described in the cases of Sicard and Paraf, Mayer and de Saussure, and as mentioned also in my cases 7 and 10." Also see case 22.

"Gradually, her yawning tics changed into more pronounced paroxysms of polypnea."

Van Bogaert² reports a chronic encephalitic thirty-three years of age, unmarried, starting with a so-called intestinal grippe, with later a diplopia, intermittent fever and persistent insomnia. The patient made a good recovery apparently after two weeks without residual symptoms and was well for a year. One day following some emotional upset she had a slight respiratory difficulty and shortly thereafter had a slight passing fever with jaundice. She was also quite sleepy. The patient was sleepy for three months and developed salivation, slight tremor and some dyspnea. This dyspnea was especially marked postprandially (see Jelliffe case I where the breathing attacks were always worse at meals, especially at breakfast). Difficulty in breathing through the nose in attacks of an hour or so were quite marked. The dyspnea then started when any effort was made. Finally it became almost continuous. The tremor was of the intentional type, greater in the right hand; the face is somewhat seborrhoric. In March, 1922 (2 year) polypnea 38 to the minute was present. The excursions are quite irregular and interrupted by complaints of stuffiness. Cheyne-Stokes respiration shows at times and at times there is a respiratory arhythmia. Lying down reduces the rate of breathing. Van Bogaert does not follow Bériel in his interpretation of the compensatory nature of the polypnea to the micropnea of the parkinsonian rigidity. As may be seen from our psychoanalytic observations this interpretation is not valid.

² Van Bogaert, L. *Éncephalite léthargique avec syndrome respiratoire et hépatique.* Journal de Neurol. et Psych., No. 1, 1924, January.

Sanz³ writes that an abbreviated report of a case was presented before the Spanish Medico-surgical society of Madrid by Sanchis Banus, February 26, 1923 (not found by us), which formed the stimulus for this report with which the author compares this case of his.

Case 1. A thirty-year-old man had an encephalitis with fever, delirium, double vision, etc. He entered into a chronic state of his illness with muscular rigidity and later developed a respiratory disturbance which had persisted without much alteration for a number of months. The respiratory anomaly consisted in an extreme increase in the rapidity of breathing to about 70 to the minute. By strong effort, or if such interested in something else the rapidity of the breathing would be temporarily diminished. Also there would occur paroxysmal exacerbations in the course of this rapid breathing during which the rate would be increased to 80 to 90 to the minute. Inspirations are noisy and quite apparent to the eye. As for the expirations they are much shorter, less brusque and also noisy. Pharmacotherapy was of no avail.

Rosenow's⁴ experimental work does not belong here but since he used Parker's cases we have cited it. Cases 1, 2, 3, three of Parker's cases, used for experimental work on rabbits. His case 4, a girl of thirteen, had a peculiar attack of deep breathing which lasted several hours. Case 5 was a woman twenty-seven years of age. Neither of these cases could be reasonably thought of as post-encephalitis respiratory attacks. Case 6, a boy of seventeen, had an irregular post-encephalitic respiratory affection. Case 7 was an acute influenza.

The experiments show that rabbits and sometimes monkeys are specially susceptible to infections, but the evidence as to etiology or to reproduction of symptoms is quite insufficient. We are totally unconvinced thus far that the results in lower animals have any real relationships to the disease of human beings. [See Jahnel. Zeit. f. d. g. N. & P., 1925.]

Navarro⁵ gives a short study. *Case 2.* J. A. (p. 11). A ten-year-old child who had a febrile affection in November, 1922, with agitation, insomnia, confusion and some tonic convulsions. Seen in December, 1923—greatly exaggerated respiratory movements, both inspiration and expiration being noisy and also much more rapid. These respiratory changes are not permanent but are paroxysmal. See later (p. 17) in September, 1924, the respiratory attacks had improved but she had an attack during the interview with noisy deep and rapid respirations

³ Sanz, E. F. Síndrome respiratorio post-encefalítico. Arch. de Neurobiología, IV, 1924, 16.

⁴ Rosenow, E. C. Experiments on the Etiology of Respiratory Arrhythmias Following Epidemic Encephalitis. Am. Arch. of Neur. & Psych., XI, 1924, 155.

⁵ Navarro, J. C. Secuelas de encefalitis letárgica. Rev. d. l. Ass. Med. Argent, XXXVII, 1924, 7, No. 231, June.

which lasted for a short time (algunos instantes) during which the patient was completely conscious.

Motzfeldt's⁶ case is of a twenty-year old student who had an encephalitis attack in 1920 with diplopia and loss of patellar reflexes. First seen in 1922. From the first the respirations were very characteristic. The otherwise tranquil respirations were rapid and were interspersed by periods of tachypnea. Frequently the respiration rose to 40 or 50 to the minute—expirations of varying types, noisy or stertorous. Nothing of the Cheyne-Stokes variety. These periods would last mostly from 3 to 5 minutes. The patient could by will power bring the respiration back to normal. "To the outside world these paroxysmal respiratory anomalies seemed to behave like asthma. There was no adiposity, tremor, nor polyuria. This condition remained unchanged throughout the period of 45 days that I observed him during the summer of 1922."

Adlersberg and Porges⁷ would erect a new clinical form of tetany which they term "neurotic" and which is conditioned upon hyperventilation of the lungs. As has been known since Vernon's experiments in 1909 and for some years previously, excessive breathing may cause a relative alkalosis of the blood from too active an oxidation, which secondarily by faulty calcium supply or over calcium utilization leads to that type of hypermotility often designated as tetany, or spasmophilia. They here separate it from other tetany types and report 21 cases arranged under three rubrics: (1) Acute cases, 8 in number, occurring in excitable nervous women between twenty-three and fifty years. The breathing attacks which led to tetanoid symptoms followed some shock which led up to a high grade of excitement with dyspnea. Group (2). Cases with a chronic course on an encephalitic or hysterical foundation. Here 5 cases are reported, one excellent pneumograph (comparable to our Case I) in a so-called "hysterical" patient. Here the forced breathing attacks are accompanied by the tetany-like cramps, the changes in the CO₂ blood concentration, the pH and the calcium content.

Group (3) takes up 8 cases where breathing attacks accompany cardiac disease (mitral) with or without other valvular defect. Six had a perpetual cardiac arrhythmia.

This is an interesting study which should be read with the work of Rosett, which does not seem known to these workers.

Suckow⁸ has here given a very complete study of the phenomena, first presenting a rapid summary of the previous studies of both the acute

⁶ Motzfeldt, K. Tachypnea After Encephalitis Lethargica. *Norsk. Mag. f. Laeger*, 1924, 225.

⁷ Adlersberg, D., and Porges, O. Die neurotische Atmungstetanie eine neue klinische Tetanieform. Vienna, 1924.

⁸ Suckow, Johannes. Atemstörungen bei der Encephalitis Epidemica. *Monat. f. P. u. N.*, LVI, 1924, 317.

and chronic situations. He then presents a series of cases observed by himself.

Case 1. A thirty-eight-year-old laborer who had a light grip attack in October, 1918. In the spring of 1919 he first noted weakness of his legs and then mouth twitches which interfered with chewing and swallowing. In November, 1919, he had insomnia lasting some time. In November, 1920, he came into the Berlin Psychiatric clinic with developing parkinsonism which by May, 1922, was severe. His respiratory difficulties were first of a sense of constriction in the chest which X-ray examinations showed are due to a micropnea from slowed diaphragmatic cramp-like movements. Deep sighing inspirations were also present. These are illustrated by curves.

Case 2. A barber fifty-seven years old. Acute encephalitic stormy onset January, 1922. In November, 1922, at the clinic he showed residuals of his encephalitis with difficulty in breathing due to X-ray demonstrable slow asymmetrical diaphragmatic contractions.

Case 3. A thirty-six-year-old official who in January, 1920, had a mild grippe attack with later pain in the back and then a tremor of the left foot. Insomnia. By October his legs were stiff and his gait slowed. He then had rapid and wheezy breathing which by April, 1922, had become continuous even persisting during his sleep and only discontinued during eating and writing. By February, 1923, he must be fed, marked salivation, sweat and tear excretion. The breathing became better appearing then only in attacks. X-ray showed a rigid diaphragm. In the attack-free intervals the breathing is difficult, slow and small. The alternations of tachypnea and micropnea resemble somewhat Jelliffe's case I but the attack is not so stereotyped and no trance states or tetanoid features were recorded.

Case 4. A twenty-year-old laborer with grippe-like encephalitic onset with ptosis in January, 1921. Then typical choreatic movements. By June, 1921, he developed coughing breathing attacks attributed to a tickling in the throat. These diminished somewhat but the breathing still showed a strong expiratory push which on admission to the clinic in March, 1923, showed a strong expiratory cough-like character. Salivation was later marked. No X-ray findings of the diaphragm, but a gradually developing irregular tachypnea.

Case 5. A schoolboy of thirteen who had an acute disturbance in January, 1921, with delirium lasting 2 days and then lethargy for 14 days. Late in February he went to school and then a period of insomnia intervened. He was sleepy in his classes and had to give up. Choreatic movements and restlessness followed and he became irritable, difficult to control, teased his associates. In May, 1922, the breathing became frequent and hasty and in June entered the clinic. Here he had frequent attacks of rapid breathing with much spitting, bending over almost to

the floor. After an attack he rights himself and sticks out his stomach. By March, 1923, the breathing attacks were characterized by rapid breathing, nasal blowing with much mucus which he smears over his face. During periods of apnea X-ray examination of the diaphragm shows it to be in a fixed inspiratory position. In tachypnea the diaphragmatic movements are directed backwards. The illustrations show bodily postures similar to a number of other cases, the author citing those of Urechia and Mihalescu, and Francioni.

Case 6. A seven-year-old boy who in January, 1920, had an attack of delirium with phantasies of water, canoes and sailboats. In June, 1920, he entered the clinic where he had an inverted sleep formula, choreic movements, at night standing up in bed, talking out loud, whistling and uncontrollable. He improved but on readmission was hypomanic and then developed wheezing, rapid, rhythmic breathing attacks with open mouth which would last an hour at a time. He became unruly, was dirty, spit over everything and smeared things with feces as if to attract attention, which motive seemed to be present in his breathing attacks. By February, 1922, the breathing attacks became more frequent and he showed angry aggressive activities alternating with tender expressions of affection. The X-ray studies of the diaphragm showed no marked tonus.

Suckow then discusses these six cases particularly with reference to the hyperkinetic and akinetic breathing activities as shown in the chest and diaphragm and illustrated by many curves. The analogies to other muscular activities in post-encephalitic parkinsonism are discussed. In general the author goes no further for the explanations that "irritation of breathing centers" (p. 343), calling attention to certain of the more recent studies upon the vegetative nuclei. Of psychogenetic components there is no mention.

In 1925, Boyd's second study of the Winnipeg epidemic contains some excellent material; Witzel publishes some notes confirmatory of some of Runge's and our own findings, and Turner and Critchley give an extended study which, were it not for certain omissions contributed to by our own study and those of Runge and Witzel, might have made it unnecessary for us to have prepared this present paper, so complete and detailed is their handling of the subject.

Gamble, Pepper and Muller's report is also of special moment here.

Boyd⁹ writes: "Out of a number of striking examples of this condition the following history may be quoted. The case was a typical one

⁹ Boyd, William. Epidemic Encephalitis: The Second Winnipeg Outbreak. *Quart. Jl. Med.*, January, 1925.

of encephalitis with marked lethargy. During the acute stage the respirations were somewhat rapid, averaging 32 per minute. The temperature was slightly elevated. At the end of two weeks the temperature returned to normal, but the respirations increased in rate to 50 or 60 per minute. The rate gradually went up, and when the patient was discharged, very greatly improved, at the end of three months, the average rate was 70 to 80 per minute. Some four months later he was readmitted to hospital complaining of shortness of breath and weakness. On seeing the patient one was immediately struck by the very rapid and shallow respirations, which were between 80 and 90 per minute. During sleep the rate was only slightly slower. This rate was maintained until the patient was discharged a few weeks later.

Witzel¹ deals with a number of cases in which respiratory attacks were present and which in three cases made definite responses to psychoanalytic treatment comparable to Jelliffe's patient I. The details of the breathing spells are not extensive, the accent being placed upon what he designates the psychoneurotic element.

Case 2. A fourteen-year-old girl, at twelve, December, 1919, had a short period of influenza with brief hallucinatory episode "seeing her girl chums in the room." Changes in character followed. These consisted of irritability, irascibility, stubbornness, sleep in day and awake at night. A year later rapid, labored breathing. At the age of eleven two boys, older than she, masturbated in front of her, this being followed by manipulation of her genitals by one of them, a cousin. It was then revealed that this act on the part of the cousin was accompanied by this type of breathing, as was subsequent masturbation. Also, following the experience with the cousin whom she associated with her father, and for whom there was a very strong attachment, she had witnessed on several occasions the sexual act of the parents, each time becoming tense and having difficulty in breathing. She also wished that she could take the mother's place.

Case 3. A girl of fourteen, encephalitis in December, 1920. February, 1921, she had rapid forced breathing. At the age of fourteen, just prior to her illness, boys considerably older than she urinated in front of her. This was followed by asking her "to be bad with them." One of them threw her on the ground and tried to touch her genitals. She became frightened, struggled, and afterwards it was difficult for her to get her breath. After she became ill she began to think of the male organ, became upset, and displayed dyspnea. Since then the thought or sight of a male brought on the type of respirations described. This act on the part of the boys was repressed; a conflict had arisen when she thought of telling about it to the mother, because of fear of the

¹Witzel, A. E. Epidemic Encephalitis and the Psychoneuroses. State Hospital Quarterly, X, 1925, 387, May.

mother's reprimand. When previously censured by the mother there had always been a fear reaction. It was later revealed that there was a marked dislike of the mother. Her reaction to this was shown by throwing things at and striking the mother during her illness.

Case 4. An eighteen-year-old male. History of masturbation and forced respiratory movements and facial tics during the masturbation. No history of an encephalitis. The act of masturbation was always accompanied by labored breathing and facial spasms on ejaculation. In this case there was also a marked attachment to the mother and a corresponding dislike of the father. In connection with onanism he always thought of a school teacher, a sister, whom he associated with his mother. As stated before, attempts at repression of this act were made, especially by the father, who, when he caught the boy at it, would put him in a tub full of cold water or chastise him physically. He would first



Photograph of Case 1 taken during the phase of inspiratory apnea. The tongue is seen protruded between the inverted lips, the face is rapidly becoming congested. (Turner and Critchley.)

become tense with either procedure, then with relaxation would breathe, according to him, "as if I had run a hundred yard dash."

It seemed to the writer that in each instance repression had been at work, and that the material came from an unconscious level.

With psychotherapy these respiratory disturbances disappeared in Cases 2 and 4, and were lessened to a marked degree in Case 3, who was transferred from the service before the investigation was completed.

Turner and Critchley's² study is the most complete general account in English of the post-encephalitic respiratory disturbances which has appeared to date. The authors open with short discussion of the respiratory disorders of the acute stage which will not be entered into here and then present an almost complete résumé of the various cases reported of post-encephalitic respiratory disturbance with an exhaustive analysis



Same patient as before, taken at the moment of the forced expiratory effort. The face is seen distorted into an extraordinary grimace, the mouth opened widely, the eyes deviated upwards and the head thrown back. The facial congestion has given place to extreme pallor. Note the clenching of the fists. (Turner and Critchley.)

of the clinical syndromy including respiratory tics, the pathogenesis, diagnosis and treatment. They emphasize the bad prognosis of this particular diaschitic syndrome and say that the clumsier forms of psychotherapy such as suggestion, hypnosis, anesthesia by faradism are of little or no avail.*

² Turner, W. A., and Critchley, M. Respiratory Disorders in Epidemic Encephalitis. *Brain*, XLVIII, 1925, 72, May.

* I am greatly indebted to Drs. Turner and Critchley for the permission to reproduce photographs and tracings of these cases, and to Dr. Gordon Holmes, editor of *Brain*, and the Macmillans for the use of the clichés.

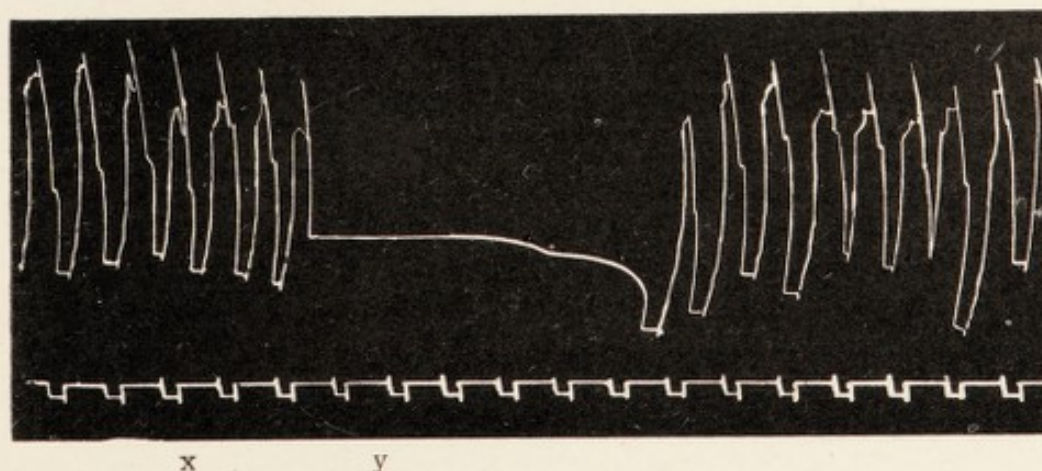
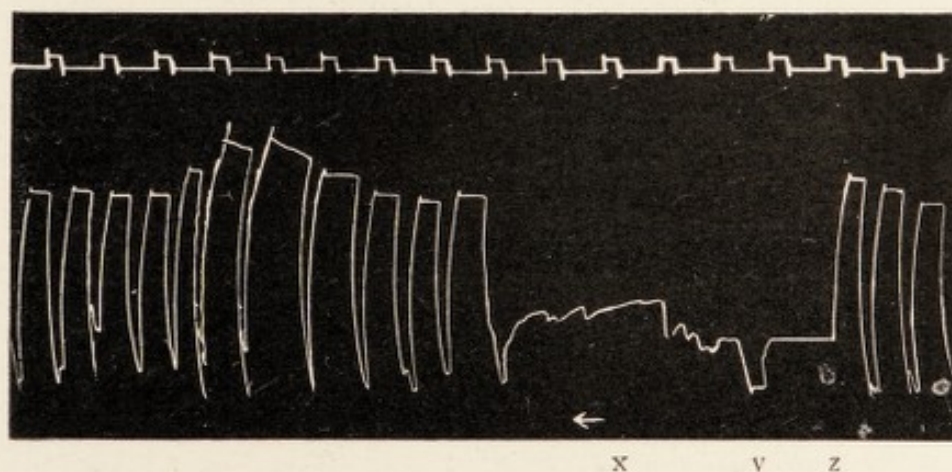
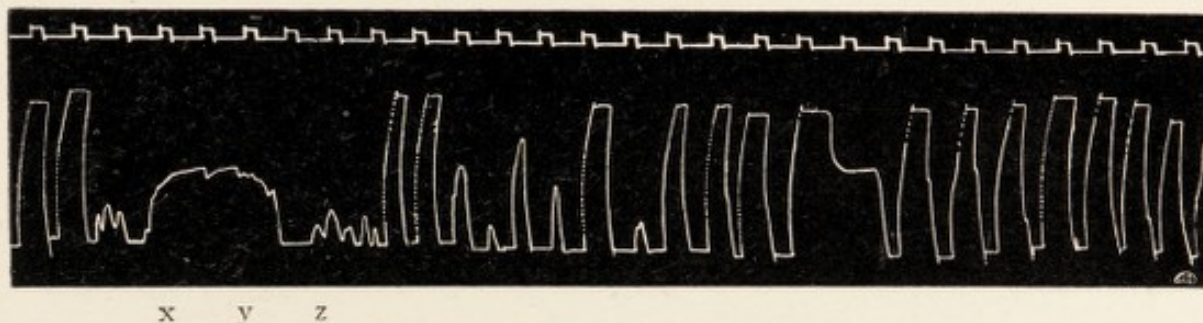
Case 1. Boy of sixteen who two weeks before Easter, 1924, had drowsy spells, followed by Easter by restlessness, headache and fever, then a four-day delirium, chiefly utilizing his occupation. He convalesced slowly. A month after the onset he had a nervous cough. The latter part of September, 1924, he would suddenly waken from his sleep. He then had a "faint," and then he had a series of "turns" which became almost continuous. These turns are combined respiratory and motor activities. The attacks occurred at first every thirty seconds. They begin with a few deep and labored respirations which increase in



FIG. 4. Same patient taken during the third and final stage of the respiratory cycle, *viz.*, during the period of expiratory apnea. The head is slightly turned to the left, the left side of the face is in a state of spasm. Both fists are clenched and the left arm is in the process of being flexed and externally rotated. (Turner and Critchley.)

depth and intensity and sometimes accompanied by a hacking cough. A period of apnea follows, the chest being held in full inspiratory distension. The face becomes cyanosed, the forearms are flexed and pronated, to fists tightly closed, the neck and back arched in opisthotonos and then

a series of rubbing hand on chest, clawing air, clenching and unclenching the fists occurs, the veins stand out, exophthalmos develops and the tongue protrudes and after a long expiration the phase is over. The cycle occupies 20 to 30 seconds (figures) and may be repeated as many



FIGS. 6, 7, 8. Pneumograms of Case 1 showing respirations irregular in time and spacing, interspersed with periods of apnea, (x) apnea in almost full inspiration, (y) forceful expiratory effort, (z) short periods of acapnia. (Turner and Critchley.)

as 13 times in 5 minutes. These attacks continued despite all therapy, but are partly controllable by effort. He later showed some exhaustion, almost fecal incontinence and some religious delusional thinking.

Case 2. Male, twenty-six, who had encephalitis in January, 1920, lasting 4 to 6 weeks with later parkinsonism. In September, 1923, exaggerated yawning movements occurred. (See illustration, Fig. 10.)

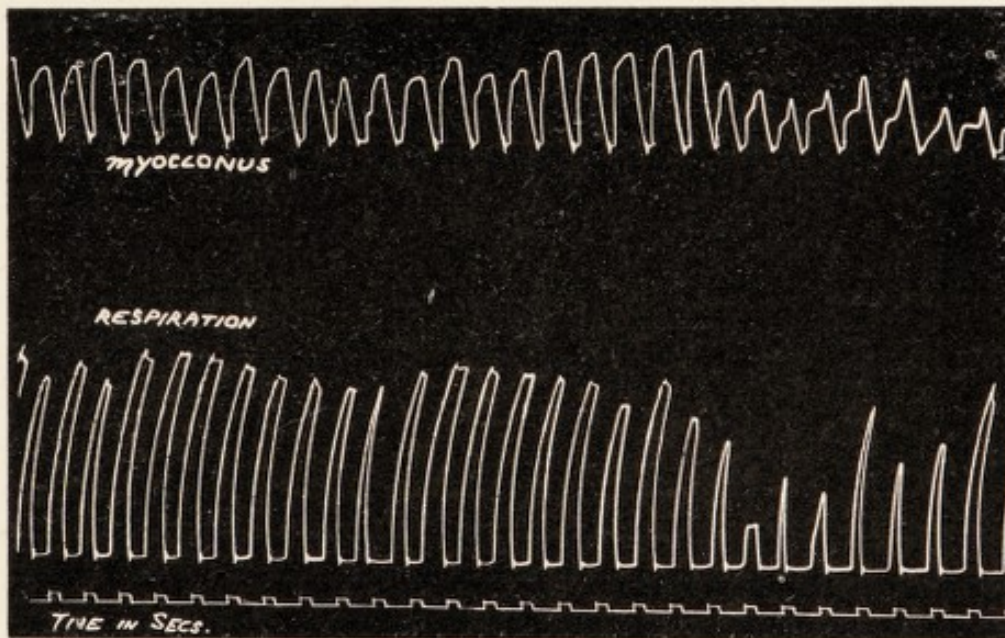
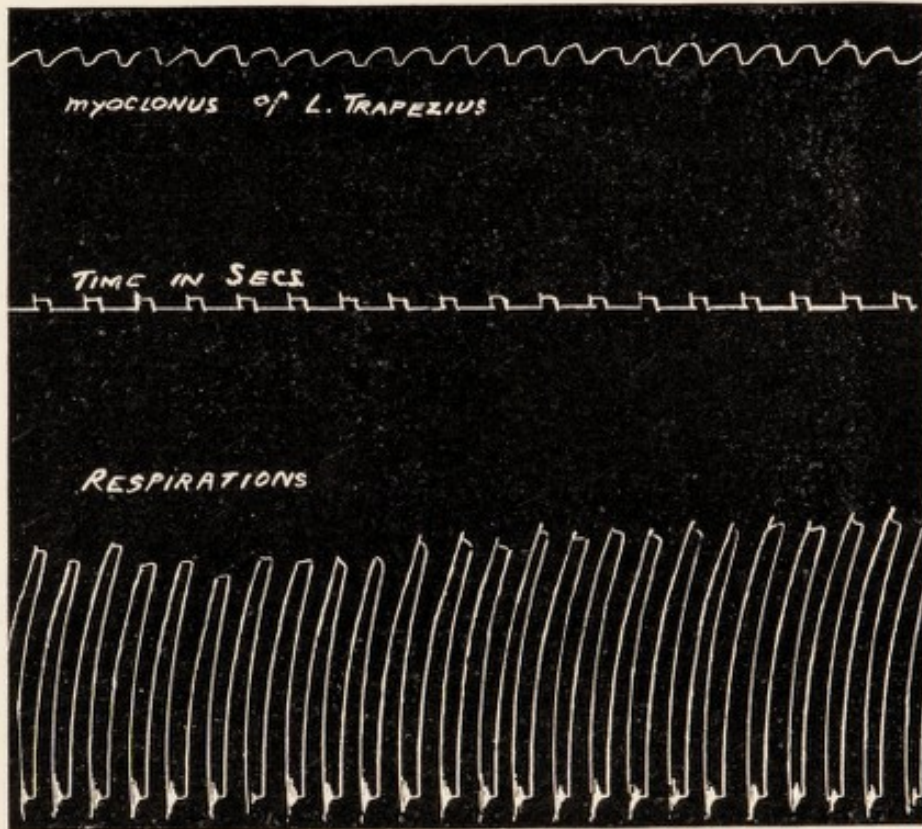
Case 3. Girl of fifteen who had an encephalitis 7 months previous to hospital admission. During the day the respiration was normal. At night in bed she had difficulty in getting her breath and was restless. When asleep her respiration was interrupted by irregular apneic pauses and sighs accompanied by irregular torsion movements of the limbs.

Case 4. Butcher of nineteen who in March, 1924, had an attack of encephalitis followed by a persisting myoclonus. He became mentally



FIG. 10. Photograph of Case 2 illustrating the wide involuntary opening of the mouth. (Turner and Critchley.)

dull. In February, 1925, he showed rapid and noisy breathing (40). The respirations were irregular in amplitude and in time. Inspiration is short and abrupt and is followed by a short inspiratory pause. Expiration is slow and is pulled up quickly by the onset of the succeeding abrupt inspiration. Myoclonic movements of the upper recti abdominis and of the shoulder muscles accompany respiration and synchronize with the onset of each inspiration (compare Marinesco's case). During sleep the breathing is even faster (60 to minute) and noisy. Inspiration is nasal



FIGS. 11a and 11b. Tracing taken from Case 4 recording simultaneously myoclonic movements of the left trapezius and respiration. Note the rapid rate of breathing, and also the synchrony between the myoclonus and the respiration (Turner and Critchley).

and strident and is longer than expiration. There is no pause between the inspiratory and expiratory components but after each exhalation there is a momentary period of apnea. The myoclonic movements are not then apparent. Radioscopy shows full diaphragmatic excursions.

Case 5. Female of twenty-two who in July, 1923, had an acute encephalitis while in Australia. In February, 1924, rapid breathing attacks appeared which continued all day but with no distress. Later she noted tingling and cramps in her hands and feet and in the left side of her face. In March, 1924, these paroxysms of polypnea were now frequently followed by "fits" in which she became rigid and cyanosed and lost consciousness for a few seconds. These attacks were nearly always nocturnal. No tongue biting nor micturition. With severe panting attacks tetanic cramps of the hands occur. (See Barker and Sprunt's case and Jelliffe's case I.) Chvostek on the left side of face present.

Case 6. Male, twenty-five, who in March, 1924, had an encephalitis and in June, 1924, a relapse with return of delirium, reversal of sleep habit and the onset of breathing difficulties. He breathes deeply and rapidly and forcefully in order to "get air into his lungs." "Pulsa-

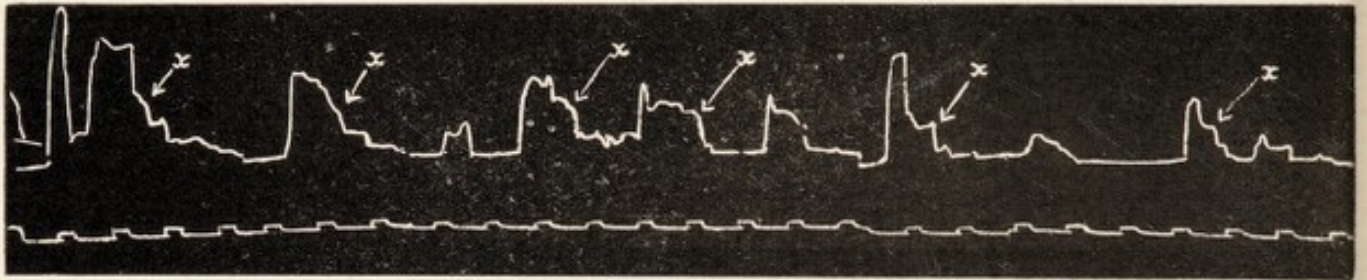


FIG. 12. Tracing taken from the lower costal cartilages of Case 6 showing shallow respirations which are irregular in time and amplitude. Note the peculiar broken or "saccadé" character of the expiratory component as shown by the down stroke of the respiratory curve (x). (Turner and Critchley.)

tions in his nerves" he says occur. The respirations are shallow and rapid, 24 to 70 to minute, irregular in time and amplitude and rather noisy. Inspiration is normal but expiration is cogwheel or broken in character. The upper thorax is immobile becoming fixed in a position midway between inspiration and expiration. Breathing is almost entirely diaphragmatic and the lower intercostal spaces are indrawn to an unusual degree. Only the alae nasi of the extrarespiratory muscles are used. The tachypnea is paroxysmal in appearance, but the cogwheel character is constant. The attacks tend to become worse at nightfall. The diaphragm is freely movable.

Case 7. A stoker, fifty-five years old, who had an acute encephalitis with headache, lethargy, delirium, and diplopia with respiratory symptoms which persisted as residuals. The breathing was rapid, 26 to 64, irregular with noisy saccadé and shallow respirations, as though the diaphragm were in a state of tremor (see Laignel-Lavastine). Breathing was at no time normal but tended to become worse in paroxysms. The tachypnea persisted during sleep. After six months in the hospital the tachypnea persisted.

Critchley³ reports for **Collier** two cases at the March meeting of the Royal Society.

Case 1. E. S., a butcher boy, aged nineteen. In March, 1924, had an attack of epidemic encephalitis, characterized by insomnia, delirium and myoclonus of the shoulder muscles. The patient's recovery was never complete; he became dull in mentality. Insomnia gave place to lethargy, and the twitching of the muscles persisted.

His present state is one of mild parkinsonism. There is definite myoclonus in the upper halves of both trapezii, and to a less degree in the pectoralis, deltoid, biceps, and triceps of the left side. The upper bellies of the recti abdominis also show myoclonus. These movements cease during sleep.

The respiration is rapid (40 per minute), and each inspiration synchronizes with the myoclonic jerk. The breathing is noisy, especially during sleep. The tachypnea, which persists throughout day and night, is not accompanied by any thoracic distress.

*Case 2.*⁴ I. C., female, aged twenty-three. Last June was attacked with acute epidemic encephalitis (diplopia; delirium). Patient has never made a complete recovery from this illness.

Gradual onset of parkinsonism. Patient states that ever since last June her right hand has been contracted. At present the right hand is claw-like in attitude. Feeble flexion is possible, but extension is impossible. The right elbow is also contracted and cannot be extended past a right angle. The left elbow cannot be extended to more than 120°. Both legs are fixed in extension and the feet are drawn up in an exaggerated pes equinus attitude.

Patient's respiration is normal during the waking state, but when asleep the breathing becomes faster (38 per minute), regular, and shallow.

Gamble, Pepper and Muller⁵ report an interesting case which terminates this summary of the literature. It concerns a Polish male of 38 years who probably had an encephalitis in Nov., 1924. He had an initial delirium and improved but by Jan. 13, 1925, he began to breathe fast and hard and had to be propped up on several pillows. He went to the Hospital of the University of Philadelphia. He there showed mild right hemianesthesia, seventh and eighth nerve involvement, pupillary changes, 84 to the minute, horizontal nystagmus, marked

³ Critchley, Macdonald (for James Collier, M.D.). Case of Post-encephalitic Myoclonus and Tachypnoea. Proc. Royal Soc., Section Neurology, June, 1925 (March 7).

⁴ Critchley, Macdonald (for James Collier, M.D.). Case of Post-encephalitic Contractures and Paroxysmal Tachypnoea. Proc. Royal Soc., Section Neurology, June, 1925 (March).

⁵ Gamble, C. J., Pepper, O. H. P., Muller, G. P. Postencephalitic Tic of the Diaphragm. Pulmonary Overventilation and Relief by Blockade of the Phrenic Nerves. J. A. M. A., 85, 1925, 1485.

tachypnea and partial closure of left fist during the paroxysms. Pneumographic study showed apparently no thoracic involvement but marked diaphragmatic myoclonic movements which accounted for the tachypnea. There was breath holding, the thoracic rhythm became a 2-1, an inspiration following after every second tic. The condition was obscured during sleep. The diaphragm would move when the breath was voluntarily held. During normal thoracic breathing the diaphragm followed the tic pattern. Overventilation was evident and blood study showed characteristic alkalosis. Page No. was 73.

The most interesting feature of this case report was that a surgical blocking by ethyl chloride spray freezing was done upon each phrenic nerve. During the operation the respirations fell from 96 to 20 per minute. The relief was permanent up to the time of publication, 7 months, i. e., Oct. 27, 1925. Pneumographic tracings showed normal breathing. Further observations are promised.

PART II

REPORT OF TWO CASES AS PARADIGMS

Case I

This particular case is of considerable interest not only because he made a complete recovery during psychoanalytic therapy (see Witzel's cases), but also because he has been under observation for nearly a year and was reported by C. W. Burr, who had him under treatment. Hence any personal ideas of how sick he was or was not can be further interpreted in the light of Burr's report.

I therefore give Burr's description first and append my own later. Certain small inaccuracies in Burr's description are questioned (?).

Case 1.⁵ History. [Compare this with report later appearing.] This case shows the influence of soil, the kind of protoplasm one is born with, in determining the results of acquired disease. If the youth had had a different heredity, he would have presented a different clinical picture, because different protoplasms react differently to the same stimuli. Had the physicians who examined him before he came under my care learned the family history before making their diagnoses, there would not have been such great differences in their opinions. Forming their opinions on a mere cross section of his life, his condition on one day, one diagnosed hysteria, another dementia precox, a third high grade imbecility and the fourth petit mal.

He came of highly intelligent but uneducated German-Russian Jewish stock. His mother was very neurotic, indeed hysterical, and his father was subject to outbursts of causeless anger, followed by periods of depression.(?) Neither parent knew how to train and guide a boy born, as this boy was, with abnormal tendencies.

The patient during childhood and early boyhood was bright but neurotic, and presented no marked abnormalities in conduct or behavior until he was seventeen years old, when he began to have a respiratory tic,(?) for which I could find no exciting cause. At first he had many attacks daily, of rapid, noisy expiration lasting a minute or two. Some months later, his nose was fractured, and the resulting obstruction increased the severity but not the frequency of the tic. The nose was operated on, and soon after he passed through an attack of scarlet

⁵ Burr, Charles W. Sequelae of Epidemic Encephalitis Without Any Preceding Acute Illness (Chronic Encephalitis). *Am. Arch. Neur. & Psych.*, XIV, 1925, p. 20. Case I.

fever. Several months later, the respiratory tic ceased. The cause of the cessation I do not know, but I am sure it was not the curative effect of the fever. He returned to high school when eighteen years old (January, 1923), but did not do well and soon began to have "drowsy spells." The teacher, two months after his return, notified his parents that he would either have to keep awake or leave the school. No one suspected illness; everyone, like the teacher, assumed laziness.

During the Easter vacation, almost three months after somnolence began, he suddenly became acutely ill with sore throat, vomiting and fever, and two days after the onset delirium appeared. At the end of a week, he seemed to be well, and returned to school, which he attended until the end of the school year, but he did not do well. The periods of sleepiness continued, and he failed in his examinations. [This encephalitis attack was one year earlier and preceded the tics. J.]

He was brought to me when nineteen years old because of personality changes. His parents stated that from the time the tic began they had noticed alterations in his conduct, which they thought indicated viciousness. Previous to its appearance he had been a bright, happy, ambitious and industrious schoolboy. He grew lazy, surly, had outbursts of causeless anger and became disrespectful toward his parents. They verified the history of attacks of sleepiness, and rapid breathing and *were positive* that the acute febrile attack, mentioned above, occurred months after the other symptoms.*

Examination.—The most striking thing in his appearance was the facial rigidity. He had the facies of paralysis agitans. The skin was oily over the entire body, and he had facial acne. During my first examination he had an attack of "hysterical" rapid breathing. Neither attitude, excluding the face, nor gait suggested paralysis agitans, but at times he showed local catalepsy. If I put either arm in any position, he would hold it so for an indefinite period, and then it would slowly drop to the side. He was pleasant in manner toward me (this changed later) but was somewhat childish, making me suspect the beginning of an adolescent dementia.

Treatment and Course.—I sent him to the Infirmary for Nervous Diseases for observation. While there, his mental symptoms became marked. He had periods of surliness, was childish in manner and took interest in nothing. He had no periods of drowsiness; on the contrary, he slept poorly. He had several attacks as follows: he would hold his breath, become blue in the face, stand with eyes wide open staring into space, extend the arms and fingers stiffly, remain rigid and speechless for about half a minute, then relax and become normal. He was not unconscious during the attacks, and they were manifestly hysterical. I sent him away under the care of a skilled companion, but he rapidly

* See note by Dercum in Jelliffe's report proving this is incorrect.

became more demented and unmanageable. He would refuse to get out of bed, several times attacked the nurse in fits of causeless anger, talked impertinently to strangers, and would make suggestive and even obscene remarks to passing women. He continued to have attacks of rapid breathing and to show local catalepsy at times. Throughout the whole period of my care of him he realized that there was something wrong mentally with him, except at certain short periods when he became dull and stupid, not somnolent, if left alone, but angry, abusive, profane and obscene if ordered to do anything. When I last saw him, six months after my first examination, the symptoms of paralysis agitans had increased, his facial muscles were more rigid, there was a fine tremor of both hands, and he had begun to stoop at the shoulders.

My final conclusion was that the paralysis agitans syndrome was the result of epidemic encephalitis, but that the dementia would have appeared sooner or later in any event, indeed had already existed before. [Italics, S. E. J.]

CASE HISTORY I⁶

It concerns a young Jewish boy born November 20, 1904. His father was born in Russia, his mother in Hungary, they were not related so far as known. Both are alive and well and all collaterals are free from diabetes,⁷ goiter, alcoholism, tuberculosis, epilepsy, or any now known nervous or mental disease. [They are high strung but their protoplasm is as good probably as anyone else's protoplasm in spite of Burr's just quoted statement.] There were five children born. A brother nine years older—then a boy who died in infancy of whooping cough, then a sister four years older, the patient, now twenty, and a sister, twelve years younger. These remaining children are, so far as known, relatively healthy. The sister married about a year ago.

The patient was born without difficulty, walked and talked at the usual age, was bright and of average capacity, read at five to six, had measles only, did not wet his bed, bite his finger nails, stammer nor stutter, walk in his sleep or have other ascertainable infantile compulsive habits.

He was an impulsive, happy go lucky kind of a boy, fond of joking and joshing, was very sociable, easy to get acquainted with, fond of music, sang popular songs with much pleasure, aspired to play an instrument, but as his older brother banged the piano when he wanted to sing he never conquered the technical difficulties. He was at the average grade in high school. At twelve or probably earlier he was taught masturbation—see later the rôle played by "Jerry" by whom this genital organization period of his sexuality was influenced.

⁶ As given by Jelliffe. Somatic Pathology and Psychopathology at the Encephalitis Crossroad. A Fragment. Journ. Nerv. & Ment. Dis., LXI, 1925, 561.

⁷ Grandmother on father's side had diabetes late in life.

The forerunners are slightly perplexing. There are slight indications of difficulties in school at about fifteen to sixteen; he liked to play hookey with the "boys" and they went to "shows." Then something acute occurred:

Description of Delirium: Account by Brother

"X. had been a student at S. Preparatory School. It was near the Easter vacation when he came home. It was either the last week in March or the first in April, 1922. [Dr. Burr has it incorrectly as 1923.] He had complained of having had a slight sore throat and an influenzal condition for two or three days. The school doctor gave him the usual treatments for such ailments and thought it best to send him home for a day or two.

He came home in the early afternoon. He was running a slight temperature and was quiet and seemed depressed. We put him to bed and sent for our family physician, Dr. L. He diagnosed the condition as an influenzal sore throat, prescribing an alkaline gargle and giving a cough compound containing minute doses of codeine.

X. slept alone. He seemed quiet as far as we could tell during the night.

In the morning, along about 9 or 10 o'clock when I went into his room, he said, "Get out and let me alone. Let me rest. I had an awful night."

We left him alone. He got out of bed in the afternoon and started to wash and shave. It was apparent that something had happened to him. He acted as though he were laboring under some tremendous excitement.

When I went to talk to him in the bathroom, he was singing and shouting and laughing. "Wow," he shouted, "I like my liquor strong and my women weak." He sang and shouted and yelled while completing his toilet. His eyes were bright and his gestures and gesticulations spastic and exaggerated and jerky.

His teeth chattered and he shook all over like a jelly at times. I stood with him until he quieted down, for say ten or fifteen minutes. This acute stage of his delirium did not last more than half an hour, as far as I can recollect.

When he quieted down, he said to me, "I can't tell you what happened to me last night except that it was something terrible. I suffered all night. I dreamt that I died and then came to life again and saw angels. [There are a few more details in this dream delirium which are of psychoanalytic interest but of no importance here. Thus the "angels" he saw were two carved angel figures which were on the back of an old couch, no longer in family's possession but once used by mother while nursing this boy. He has no conscious recollection of ever having seen

them. The settee was disposed of when he was about seven!(?)] I think my heart stopped beating for a while. [Compare with many similar anxiety attacks in Encephalitis.] It was just as if I died and came back to life. Mark what I tell you. This is going to change my whole life. I'll never be the same again after what happened to me last night."

He was jumpy and nervous all day long, his teeth chattering at intervals. Toward nightfall he seemed to become his usual self again.

I was alarmed by this exhibition and at first it occurred to me that he might have been suffering from an overdose of the codeine which was in the cough medicine. I find that this was present in the mixture only in tiny dosage, not enough to have caused the disturbance.

Of course, we all worried about his behavior. But he apparently returned to normalcy the next day and went back to S. It was not for two or three months that he began sniffing through his nose, complaining of some obstruction in his nostril that interfered with free breathing. This sniffing and a talkativeness which manifested itself particularly at night were the first sequel to his night delirium.

The sniffing increased that summer. It frequently kept us up at night. I slept in his room at that time. He would talk and talk and ask me a multitude of questions at bedtime. His questions were coherent to be sure, but they became extremely annoying and finally I'd have to tell him to "shut up" in order to get him to bed.

Along about August 1st, the sniffing became so persistent that he was taken to a nose and throat man who said he found a definite obstruction in the right nostril. Arrangements had been made to have this removed when the automobile accident came along on August 28, 1922, and interfered.

In August, 1922, while being driven in an automobile the car skidded into a telegraph pole and the patient's nose was injured. This caused more sniffing and more efforts to remove the obstruction.

A Dr. A. had treated the nose at the time, and later, June 19, 1923, brought him to see F. X. Dercum, to whose courtesy I am indebted for the following history:

"I saw X. upon one occasion only. He was brought to my office on June 19, 1923, by Dr. A. of Mt. Holly. The patient's age was given as eighteen. Dr. A. stated that he had met with an accident in the latter part of August, 1922, which resulted in a bad injury to his nose. She stated that she personally had treated the injury, had raised the bridge of the nose and had dressed it carefully. Subsequently the boy saw Dr. L. There was some obstruction so that he could not breathe properly."

"Dr. A. described 'spells' from which the patient suffered. She stated that he would 'sniffle' at night, would go to the bathroom and in order

that the family should not hear his sniffing, he would turn on the water in the basin; that at times he was very uncomfortable and on some nights unable to sleep; that at times he breathed like a patient suffering from asthma. If his attention was diverted, the attacks usually ceased. She stated that at other times he would occasionally get into a condition as though 'suffering from tetany'; that his hands 'would get clenched.'*

"The physical examination by myself yielded little of moment. The gait and station were normal. There was no tremor, the tongue was protruded in the median line and not tremulous. The lips were protruded firmly. The angles of the mouth were retracted equally well. The pupils were of average size, well rounded, equal, reacted very promptly to light and to accommodation and convergence. The tendon reflexes were normal. There were no sensory losses. There were no functional nervous symptoms present at the time of my examination; the mental examination also was negative. Laboratory findings reported negative.

"After making some suggestions to Dr. A. as to the boy's method of living, general hygienic care, further observation, etc., she left me with the understanding that he was to be placed under treatment, as far as the nose was concerned, by Dr. L."

History by Burr.—On December 6, 1923, another specialist [this was Dr. Burr referred to, compare with history here—B.] was consulted who has kindly sent me the following history:

"In August, 1922, patient was in an auto accident, suffered a fractured nose but was not unconscious. He entered the J. Hospital for a nose operation for obstructed breathing. Prior to accident he had a tendency to a habit spasm of forcibly expiring air through his nose. While in J. he contracted scarlet fever and was sent to a Municipal Hospital. He had a light attack and in six weeks returned for the nose operation. Following the nasal operation he went to a business college one month, was still continuing the habit of forcing air through the nose. In January he again returned to high school. But it seems he did not succeed well; the patient states he had drowsy spells, would try to concentrate, then fall asleep. The teacher remarked that he would have to remain awake, or he could not stay in the class. He did finish the year of school but failed in two subjects. He states he worried constantly over the obstruction in his nose; he lacked interest in his work."

"In March, 1923 (this should be 1922), Easter vacation, he had an attack of sore throat, grippe, and a severe stomach upset. In about forty-eight hours this was followed by a semidelirious spell with fever; states he had a terrible dream in which he was dying and saw angels. The next day he was very much excited, seemed afraid and continually screamed, 'I will never be the same again.' He seemed to be normal the next day and returned to school, but the patient states he continued to feel sleepy in school.

* Thus Dercum's notes show he had the "spells" before 1923 as erroneously denied by Burr.

July 1 (1923), a tonsillectomy was performed; immediately following this, the patient began to have spells of deep breathing through his mouth.† These spells usually come on in the daytime, and occur after excitement, they are simply attacks of deep rapid breathing that last about five minutes, then the hands will straighten out and be stiff and uncomfortable. At the same time the muscles of the face stiffen. At one time his feet have stiffened with the attack. The patient states that at this time, and the mother confirms the statement, that he had salivation "drooled at the mouth." His brother often remarked that he foamed at the mouth and the mother would ask him to use his handkerchief for this. He still has this trouble, but not as bad as before. Since July he states, "he feels lazy all the time—lacks pep," he adds: he has felt this way since the scarlet fever. He feels drowsy all day long, but cannot sleep. The early part of the night he is awake, then falls asleep about 2 A.M. During the month of August, he was at a boy's camp, and felt some better there, but the breathing continued."

"In October (1922), he had another nasal operation, obstructed right nostril. States his breathing is worse since then. The patient states he is irritable and the mother confirms this, she states he seems to greet strangers warmly now, whereas before he never did. She thinks there has been a decided change in his personality."

Physical Examination—General: The patient is a robust boy of about twenty years, pleasant and agreeable, seems overly agreeable, his reaction does not seem perfectly normal; he has a tendency to be child-like in his behavior, but this is not marked. There is a noticeable fixity of the facial expression, and his face is unduly oily with slight acneform eruption present. There is no noticeable body stiffness, nor are his movements slowed, there is something suggestive, however, in the way he seems to maintain one position for long periods, such as holding his hands and arms semiflexed.

"Eyes: Half staring. Reaction normal, extraocular movements normal. Fundi: Retina appears slightly congested, with disk margins slightly hyperemic, although this may be normal.

"Cranial nerves: Loss of facial expression, otherwise normal. No seventh nerve weakness of either side.

"Mouth: Tongue slightly coated. Teeth O. K. Tonsils removed.

"Chest-heart sounds normal. B. P. 120/75. No murmurs.

"Lungs: Clear and resonant throughout.

"Abdomen: No masses or rigidity, reflexes all present.

"Extremities: Upper, very slight tremor of outstretched hands, power O. K. No rigidity, reflexes are overactive on both sides.

"Lower: Outside of unusually prompt and equal achilles and patellar jerks, neurologic examination is negative. No Babinski.

"Station and gait: Nothing abnormal noted."

History in Dr. B.'s private office records:

Examination December 6, 1923: Patient is a well nourished, rather well muscled youth of nineteen years. In appearance he does not look like

† See previous note of Dercum's re "spells" earlier.

the average Jewish boy, but rather of Irish descent. He gets in and out of bed easily. There is no awkwardness or any abnormality in gait, station, posture, or in use of any extremity or set of muscles, with the exception of his facial expression which is rather set and 'waxy' to a slight degree. Speech is normal. Extraocular movements normal. There is no diplopia, nor is there any history of it. Tongue is clean, shows no tremor. Palate moves well. Teeth in good condition. Thyroid is not enlarged. Pupils are equal, regular in outline, normal in size and react promptly to light and in accommodation. Vision is good in both eyes. Hearing, equilibration and taste are normal. No motor ataxia in arms. No sensory disturbances anywhere in the body. Knee jerks, Achilles jerks, biceps and triceps jerks, abdominal, cremasteric and plantar responses are equal and normal. Heart action is regular. No murmurs are audible. Rate at rest is 80 with an increase to 118 after effort. Area and position is normal. Blood pressure 118/80. Lungs and abdomen grossly normal.

"Blood Wassermann—negative. Blood count—4,470,000 red cells, 14,200 white cells, 86 per cent hemoglobin. Differential count of white normal.

"Urine—several examinations show nothing abnormal. Some mucous threads.

"He left the Orthopedic Hospital on December 24, 1923. His condition became worse. He would talk to strange people on the street; had periods of sullen anger; struck his nurse several times; and masturbated frequently.

"Though there is no positive history of epidemic encephalitis I believe that he had it, and that it is very largely the cause of his present condition. I also believe that there is more degeneracy in the case than I have been informed of, and that that has causal bearing."

He was under Dr. B's treatment for several months. Dr. B. saw him every month or six weeks during which time he was sent on a farm. He had a male nurse with him. Here he was no better. The patient states that he had a miserable time on the farm. He slept most of the time on a big sofa and was unable to do any of the help on the farm expected of him. This took us to June, 1924. His respiratory attacks he states were frequent, sometimes 15 or more a day, he had polydipsia and polyuria and was miserable.

Then he had another nurse—a "religious fanatic," the patient called him. His behavior, especially during the trance states that followed his breathing attacks, was quite psychotic; he was obscene, swore and created scenes. These so frightened the nurse that commitment to an institution was suggested. Then the treatment under Dr. B. was terminated and the patient went to reside with a physician. This was unsatisfactory. Then he went to a "boys' camp." Here he had a hard time, he states.

I first saw him the latter part of October, 1924, and here purpose dealing only with certain features of the situation.

The neurological status at this time contained a number of findings not before emphasized. The chief ones are a well marked parkinsonian attitude and progression. For the first three weeks in November, 1924, the patient walked like a dummy with arms half bent and held outward. There is distinct weakness on the right side



FIGURE 1. *Beginning of attack*—Puffing 3 minutes, 60 to minute

of the body. A fine tremor, at times both sided, but more marked on the right side; again a hemitremor, right. The right palpebral fissure is slightly larger than the left and the left pupil is larger than the right. He has a distinct Horner's syndrome, to be discussed at some other time. Details on the CO_2 , pH, and calcium content of the blood, showed only slight variation from the presently accepted ranges. The other neurological features practically coincide with Burr's statement.

Without burdening this report with further detailed anamnesis, it may be summarized that this patient developed a mild but distinct

post-encephalitic syndrome following the delirium of March, 1922, augmented after tonsillectomy (ether), the most outstanding features of which were:

- (1) Paroxysmal respiratory episodes, nasal and buccal tics, with trance states, salivation, and occasional tetanoid cramps.
- (2) Parkinsonian attitude with slight tremor, more marked on right side.
- (3) Character anomalies, most marked when he was on the farm.
- (4) Mild "greasy face."
- (5) Polydipsia and polyuria.



FIGURE 2. Next 2-3 minutes—facial movements—hands getting stiffer

Brief discussion will be here offered upon the respiratory attacks. The seborrhea may be discussed in a separate paper; also the Parkinsonism, the polydipsia and polyuria, and the tremors.

1. *The Respiratory Attack.* The precise steps in its evolution are not altogether clear. Some weeks after the delirium sniffing was noted, and the idea of nasal obstruction became obsessive. After the auto accident, these increased and some mouth and nose grimaces

began; the full blown respiratory attack is stated by the brother to have begun probably after the tonsillar operation.⁸ They have been constant now for at least two years, although they have begun to improve greatly during the past two months.

These respiratory attacks vary in frequency, in duration, and in severity, following, in general, the type I of Marie and Lévy.⁹

Since I have seen him, a daily record has been requested, and the patient usually says 3 to 4 attacks, sometimes 2 or 3, sometimes, "oh! a lot of them." At times he has them off and on all day long. On a trip to Montreal with his brother the respiratory difficulty per-



FIGURE 3. Hands in rigid position 5-7 minutes

sisted twenty-four hours and the cramps (tetany) were very painful in both hands and feet and face. On one occasion only—February 24, 1925—he telephoned me that he had gone all day without an attack.

They seem to start for no ascertainable reason, but certain "complex indicators" have been ascertained. He says that smoking will

⁸ I have notes on a number of these respiratory attacks taking place after tonsillectomy and psychoanalytically raise a question as to whether the operation is in some way related to a castration phantasy.

⁹ Marie, P., and Lévy, G. See thesis of Lévy, G., and her monograph, *Les Manifestations Tardives de l'Encéphalite Epidémique*, Doin, Paris, 1925, p. 137 et seq.

start them, but observation shows that he seeks a cigarette rather as an effort at mitigating or side-tracking an attack. In other words, the psychical component would utilize both a cigarette and an attack as an outlet for the unconscious displacement.

The attack may be diverted or arrested. There is no certain technique that can guarantee this, but enough has been learned about



FIGURE 4. Ten minutes—trance state, which lasted 2-3 minutes—whole attack about 10 minutes

the unconscious vent to predicate along what lines one could at times supply surrogate outlets for that which lies beneath the attack. Inasmuch as different attacks represent different level discharges of preconscious and unconscious material no adequate diversion technique is likely to master all of this wish material.

Eating as with case II is accompanied by increase rather than by decrease of the respiratory difficulty.

A mild attack (high level) discharge will be finished in four to five minutes, the breathing will not be over thirty to forty to the minute, and there will be no trance state following.

In a severer attack the puffing becomes deeper and more rapid, the patient becomes definitely anxious, the contortions of the nose, wide dilatation of the nares, protrusion of the lips, etc., increasing fixation of the body, fixed rigid mouth movements, puffing or blowing takes place, the respirations go up to seventy to the minute, the pulse to 100, the hands begin to become cyanotic, and the patient is "feeling rotten," as he may be able to tell you—then the breathing gets more superficial and a definite cessation of breathing occurs (see tracing). The parkinsonian rigidity becomes more pronounced; he used to shiver a great deal at this stage, and he has a definite hypothermia—96° F.—more marked on the left than the right side; the eyes look off, the pupils dilate somewhat, the face becomes mask-like; the palpebral fissure narrows, the mouth purses up, saliva commences to drivel from the mouth, and in from ten to twenty minutes after three, four, and five minutes of this trance—in which he states his mind is a blank—in which he only "wonders if he will ever get well"—he comes to, smiles, says he has "snapped out of it" and is all right again. When he was on the farm and being "treated" by his nurse, he was frequently obscene and almost violent in these trance and semitrance states, which at times would persist half an hour [hence the "degeneracy" designated by B.].

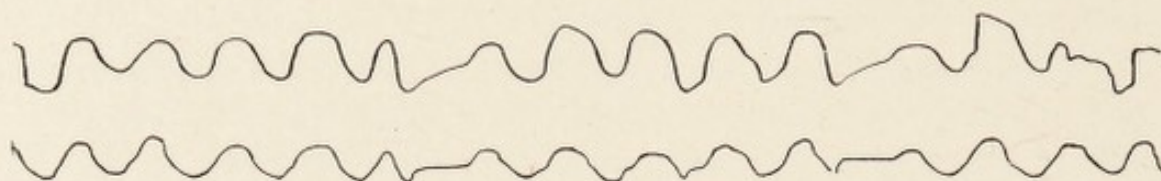
More than half of his attacks are "trance" free—and there is a record in earlier attacks of a partial loss of consciousness and the necessity for lying down in certain of these trance states. He has never fallen in one of them, but almost "goes out," he says. [These are probably the petit mal attacks to which Dr. Burr refers as diagnosed by other physicians. Narcolepsy attacks of others.]

"Trance" attacks have been recorded without any recognizable antecedent breathing attacks. These were more common during his stay at camp and while on the farm—especially at times when he had a loathing for his male nurse.

In the earlier periods the breathing attacks were accompanied by tetany-like stiffness in his jaw, his hands, left > right, and occasionally painful cramps in the feet.

One severe attack lasting thirty-five minutes took place during an

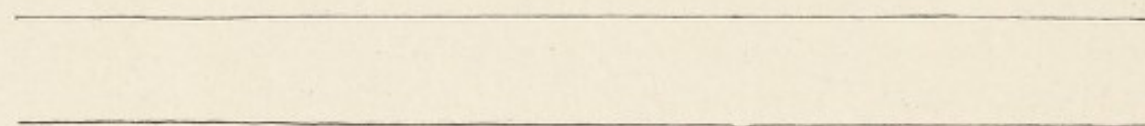
Began at 4:26 P.M., Sunday, March 22, 1925.



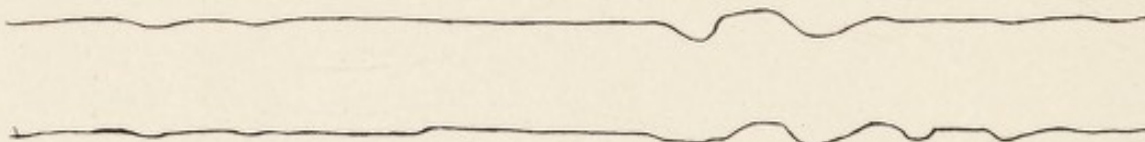
1. Period of rapid breathing—7 minutes.



2. Beginning of apneic phase—3 minutes.



3. Apneic phase—3 minutes.



4. End of apneic phase, resumption of normal breathing.

Ended at 4:40 P.M., Sunday, March 22, 1925.

First line: Intercostal Breathing.

Second line: Diaphragmatic Breathing.

Third line: Time markings at rate of 72 per minute.

interview in my office, and was accompanied by what he described as "Jesusly painful" cramps. The hands were not in a typical obstetrical position as in tetany, but were more semigrasping in their nature. He would and could not take hold of something. He had atypical Chvostek reactions, electrical hyperexcitability, but no Trousseau in the intervals.

These cramp states have been greatly ameliorated during the past two months. Only two or three have occurred since I have seen him, whereas as he recollects they were two or more times daily in occurrence and he dreaded them—crying violently from their painful and anxiety producing qualities.

His own memory is somewhat unreliable about these attacks.

Polydipsia and polyuria are accompaniments of this whole situation. At times this has been so great he would go to the toilet fifteen to twenty times a day, also drinking large quantities of water.

In the milder trance states one can obtain his attention; he may smile at a joke, answer retardedly in monosyllables, but in others there is no response, although he can repeat phrases, etc., spoken during this period, showing that he is not unconscious. In one or two attacks I have demonstrated a partial hazy consciousness without retention of what was said—quite analogous to certain "hypnoleptic"—"narcoleptic"—epileptic trance states to which they are undoubtedly definite homologues, differing but little in the unconscious content or even dynamic.

One pneumographic tracing was taken by Dr. Yale Nathanson of the University of Pennsylvania, and I append his notes, as illustrative of a comparatively average severe attack:

"Am forwarding herewith pneumographic record made yesterday, March 22, 1925, of X. The record was begun at 4:26 P.M. and continued until 4:40 P.M. The red line shows intercostal breathing with the pneumograph and body band placed above the nipples; the blue line shows diaphragmatic excursion and the time interval as shown in the bottom line is regulated to 72 per minute. The apparatus used was the Marey tambour with the double edge pneumograph and connecting tubes.

"May I say, before explaining any of the record, that I trust you will appreciate the fact that I am not attempting any interpretation of the record, and where it so seems it is due entirely, let me assure you, to my eagerness to supply you with what information I was able to glean from watching X. while taking the record.

"To begin with, while I was preparing the apparatus, he seemed more than interested and told me that he felt he was going to have one of

his typical tetanic spells. By the time I placed the pneumographs in position he was breathing quite rapidly, as shown at point 'A,' probably close to 50 or 60 per minute, and talking facetiously, making remarks about the apparatus, the room, etc., just as I have observed in him during these (several) months. He kept apologizing for making these remarks, and assuring him that it was perfectly all right, he continued his rapid breathing as shown by the record. At point 'B' he lessened his conversation but the breathing continued. At point 'C' he assumed a posture of tetany-like rigidity and reached for his pocket for a handkerchief which he held at his mouth for some time. He then maintained this position of absolute quiet, paying no attention to me or the apparatus, standing perfectly quiet and gazing into the far corner of the room, which is a blank wall. During this time, as the record shows, there is practically no breathing and a definite suspension of all activity, a slight cyanosis, about lips and chest. The only movement detectable is a slight twitching of the skin of the chest. He was very cold throughout this part of the procedure, although the room was not uncomfortable. As indicated on the record, he started talking to me and complained of feeling 'groggy.' I tried to engage him in conversation and he discussed the fights which he had seen the night before. His breathing began then and as he requested it I gave him a cigarette.

"After a minute or two he said: 'Well, I'm out of it now. Can you tell it by the record?' At this time his pulse was 96. I had forgotten to take it at any other time, but if you wish it I shall be glad to take a plethysmographic record whenever you say.

"It was quite interesting to me, the long spells of suspended breathing coming, as they do, with the peculiar lapse of attention. They look, indeed, like fatigue reactions following upon the rapid breathing and its attendant exhaustion. The lack of respiration should certainly find a high correlation with lack of oxygenation and general metabolism."

This practically completes the description of the respiratory attacks, towards which group of phenomena this study is specially directed.

I wish only to add one note to this in reference to the therapy which will be discussed later. Psychoanalysis by the regular Freudian method was carried on for a period of approximately 6-7 months, during which the attacks ceased completely and have remained absent now for over 18 months. [Jan. 1927.]

It is not without interest that an arranged meeting in my office with case II in April, 1926, when he had been free from breathing attacks nearly a year, produced a very marked emotional disturbance. He almost broke down as he was talking with case II—expressing

his great sympathy and was about to begin a breathing attack when he straightened up and said to himself, "snap out of it," smiled and was himself again.

Case II

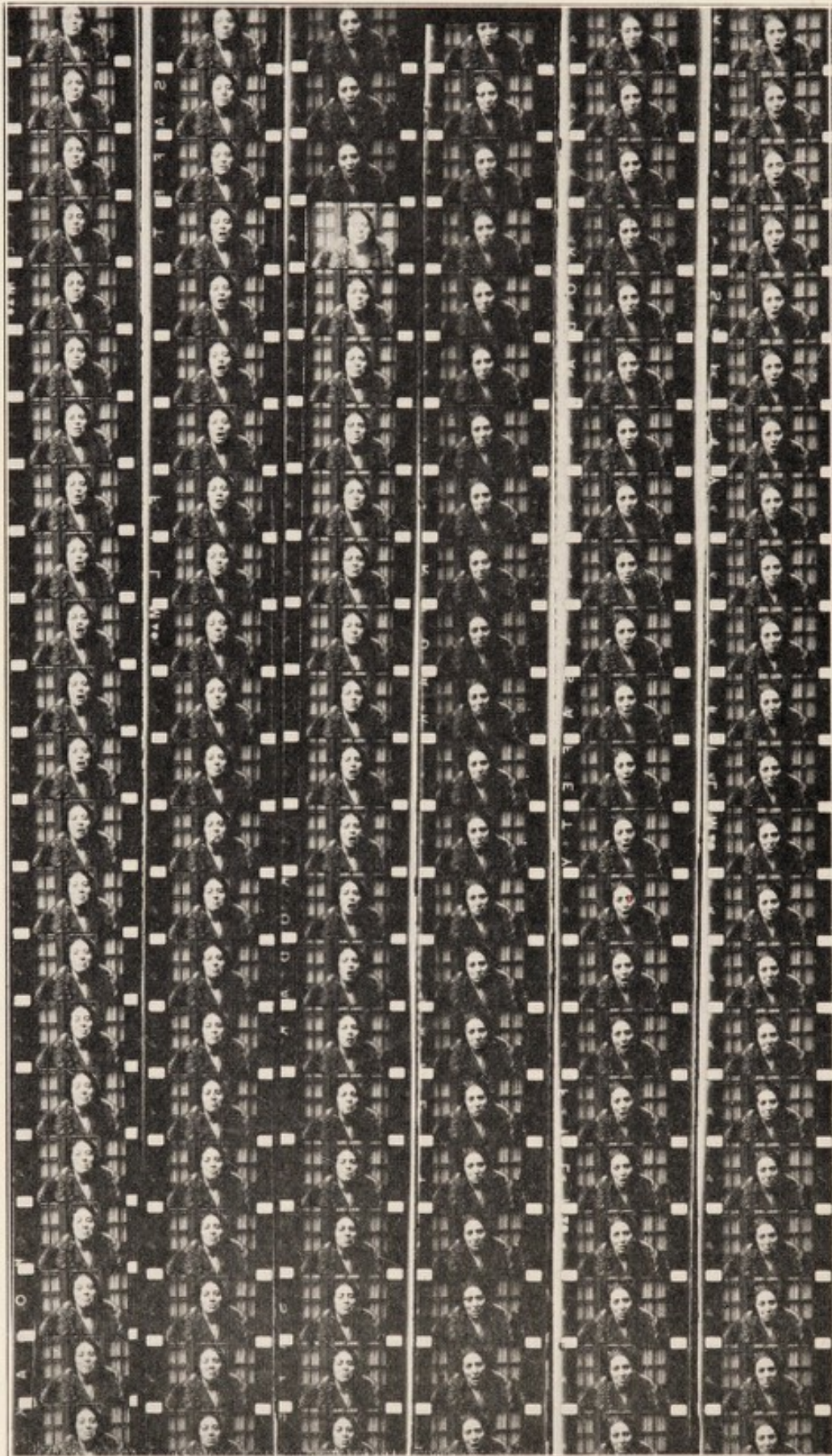
Miss Y. was referred to me on February 8, 1926, by Dr. L. Loeb of Philadelphia through the suggestion of Drs. W. G. Spiller and A. M. Ornstein of the same city.

At this date she was twenty-six years of age, single. The family history is of interest. The father was born in Germany of Jewish parentage. He has a distinct psychoneurosis, chiefly gastrointestinal in its manifest content. The mother was born in the United States of Jewish parentage. There are three children in the family—a son of thirty-three, married, with two children, reported healthy; a son of thirty-one who had an encephalitis while in the navy serving in the World War and has been psychotic for at least five years, diagnosed as "dementia precox type"; the patient is the youngest child.

There are other family disturbances in addition to the father's neurosis and that already outlined for the brother. Illy defined histories of two psychotic members of the mother's family are indirectly learned of. There is no history of diabetes, goiter, endocrine anomalies, tuberculosis, nor alcoholism on either side thus far obtainable.

Personal history: The patient was normally born, walked and talked at the usual period, read at the age of five to six. She has remained a thumb-sucker to the present time, using the middle and ring fingers of the right hand. She had whooping cough at the age of seven months, measles, chickenpox and diphtheria at five. She had no history of infantile enuresis, did bite her finger nails, did not walk in her sleep, but did talk in her sleep. There is no history of stammering or stuttering. There were no other infantile neurotic traits of outstanding character.

She passed fairly well in her studies, went to the third grade in High School by seventeen and went to a business college for a short period. There are no signs of congenital lues, she has never lived in the tropics, suffered any severe accidents, is 5 feet 4½ inches in height and now weighs 130 pounds; her weight was 152 pounds four years previously. She has a general pyknic habitus. She began to menstruate at thirteen and one-half years, and has always been regular in this function. She has smoked since about sixteen to seventeen years of age but never excessively; does not always inhale.



CASE 2. Cinematograph film of gasping attacks.

History of illness: In December, 1924, she was in excellent health. She was an outdoor girl, enjoyed golfing, motoring, dancing, was popular, made friendships, had healthy social contacts with young men and was engaged to be married when she was taken ill. She was helping a brother during the Christmas holidays in a retail store and was very busy when one night she awakened out of her sleep "in a sort of chill or spasm" as she expressed it and was afraid she was going to be ill. She was at the home of a cousin, used a hot water bag and in spite of herself felt an uncontrollable urge to talk to her cousin. This she did all night long. She narrated all sorts of incidents that were connected with her work at the store in a feverish, turgid manner, connected, but hypomanic in its intensity. Then she began to notice things upon the wall. It seemed to be alive with little black bugs crawling in every direction. These then seemed to cover everything, including herself, her arms, and her chest. This hypomanic state lasted uninterruptedly for about three days, and she was quite solicitous of her condition and made frequent complaints that no one was interested in her and no one would pay any attention to her dire distress.

She then *saw double* and was confined to her bed for about six weeks. During this time everything seemed blurred and confused. She was restless at night but sleepy all during the day time. There were no ascertainable paralyses but she was weak and distressed. She was better by the middle of February and then had a slight relapse. She was always tired and depressed and consulted a local specialist who, according to her story, told her she was "filled with germs" and who started to clean out her gall bladder. This procedure was extremely distressing and after the fourth or fifth treatment she could not stand it any longer and Dr. Loeb was consulted. At this period she was asthenic, emaciated, had a severe leucorrhoea, and had attacks of tremor of the entire bodily musculature.

By June, 1925, she was able to lie in bed in the sunshine and then the disordered breathing began. At first she had attacks of rapid breathing four to five times a day. The attacks would last four to five minutes only during which she felt that she was unable to get her breath—"her windpipe was closing on her." She had typical anxiety attacks, would rush to the window to get her breath in a veritable attack of air hunger. Her appetite was good, but she could not sleep. Hypnotics were then ordered and were used all summer. They were chiefly bromides (Somnos). She saw Dr. Spiller in July

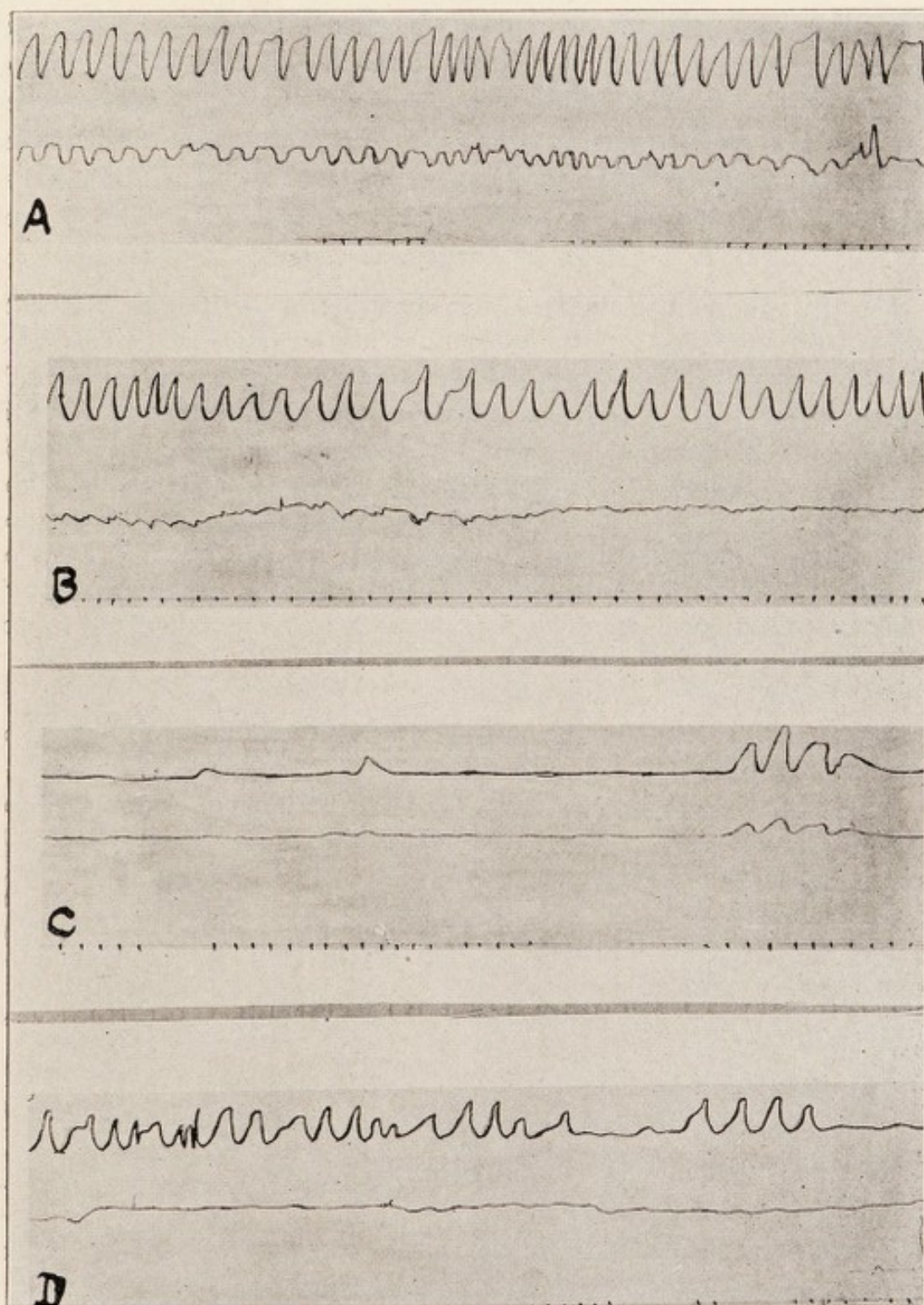
and Dr. Ornsteen later. Her nose seemed to be stopped up and she could not breathe through her nose.

The breathing spells then became more and more frequent and by September of 1925 had become almost continuous. She had fre-



CASE II. Enlarged film studies of mouth movements in gasping breathing. Six of sixteen pictures taken in one second. Read left column downward, then right.

quent crying spells, ungovernable yawning and great prostration. The leucorrhœa became more and more annoying and she used douches to control the itching which was constant. This leucorrhœa had been bothering her off and on for some time.



CASE II. Miss Y. A. Phase of tachypnea in which thoracic (upper line) and diaphragmatic (lower line) muscles are synchronously involved.

B. Tachypneic and gasping respirations with irregular diaphragmatic movements. Not myoclonic however.

C. Apneic phase with yawning respirations at end.

D. Irregular yawning and gasping with diaphragmatic dissociation.

Regarding this leucorrhœa some notes sent me by Dr. L. in February, 1926, indicated that this was an old difficulty. Dr. L. writes:

"Shortly after Miss Y. had entered a school in Boston (1918) she had some abdominal pains. She had an acute salpingo-oöphoritis on the left side—with appendicular involvement as well. The appendix was removed and part of an affected ovary of the right side. Later she had a curettage and adhesions which had caused a uterine displacement after the original operation were relieved. The microscopical examination of the discharge was reported negative."

Dr. L. gave me a summary of her condition at the time of her acute illness. She had the beginnings of an acute exophthalmic goiter with characteristic circulatory disturbances and small tumor. The exophthalmos was bilateral, $l > r$, Stellwag and v. Graefe positive. Pupils sluggish, diplopia, and visual fatigue. There was a fine involuntary tremor which increased on excitement. The patient was talkative and resentful and would talk night and day. Insomnia was marked and was controlled by hypnotics. These Dr. L. emphasizes were the most marked signs of her encephalitis attack. She began to lose weight, and then went through a deep lethargic phase in which she could not be aroused and had a pronounced amnesia for all the events of this period.

Dr. L. further noted the following:

Three to four months after her recovery from the acute phase she developed the following sequelae.

- (1) True respiratory disorders. Polypnea, bradypnea, apnoea and periodic respiration.
- (2) Respiratory pauses.
- (3) Dyspnea with vasomotor disturbances.
- (4) Inversion of respiratory formula or rhythm.
- (5) Sighs and gaping.
- (6) Abnormal nasal sensations (occasional marked mucous discharge).
- (7) Palpitation and tachycardia are very marked.
- (8) Quite recently she has developed some hysterical phenomena.

My own neurological examination of February 8, 1926, briefly narrated showed the following:

Some nasal grimacing related by patient to her difficulty in breathing but no anosmic or hyperosmic difficulties.

Sight O.K. No hemianopsia or fundus changes and no scotomata or restriction of visual fields.

Ocular muscles freely movable, no present diplopia. Pupils equal, slightly sluggish to light, $r=l$.

Trigeminus, facial, auditory and other than vagus nerves O.K. on general examination. No altered oculocardiac reflex. Sialorrhea is profuse, especially at the end of the yawning attacks.

Upper extremities no pareses, nor anaesthesiae, twitching and marked hypertonus and some rigidity. All arm reflexes + + +. No tremors save after some of the respiratory seizures when the patient had a generalized shivering reaction related to cyanosis, but she says she does not feel cold. No taxes, adiadokokinesia, or sensory defect.

Polyuria and polydipsia are both present. Slight stiffness of parkinsonian type. Patient states she feels as though "strapped to a board" when in bed. Is tense all over. No cogwheel phenomena.

Lower extremities as upper. Increased tonus, partial rigidity, increased patellar and ankle jerks + +, no clonus, no Babinski, Oppenheim, Gordon or Chaddock signs. No sensory disturbances. No gait disturbances but patient has slight propulsion—mild parkinsonism. No trophic disturbances, dermatographia or Sargent line. Irregular tachycardia, variable, but no murmurs and no pulmonary signs. Larynx O.K.

The *respiratory* disturbance is extreme. It is almost constant. The patient is in extreme exhaustion from her breathing difficulties. She pants for breath as it were.

The attacks are in reality paroxysmal but are so frequent as to seem persistent. As one watches her breathing one is forcibly reminded of a fish gasping for breath. She breathes on the average 35 to 45 times to the minute, the mouth opens, the lower jaw is pulled down, there is a fairly long inspiration and a sharp violent expiration. This goes on for from two to five minutes, then there are several gaps or yawns, and if a long satisfactory yawn is obtained she is over the attack for from two to five to fifteen minutes, but more frequently the yawns are only half satisfying and an apneic phase begins, the lips get bluer and bluer, the chest, and diaphragm (see tracings) are held, the hands have a tendency to clench and she salivates and becomes absorbed in her agonal fixation and after one to two to three minutes commences to gasp again for breath, the color comes back and another gasping respiratory episode is on.

When a deep yawn seems to terminate an attack she can converse and narrate her story or take up any topic brought up. Sometimes these free intervals last five to ten to fifteen minutes. The longest in my office has not been over fifteen minutes although at times she states she has a free interval of an hour.

The breathing attacks cease when she is asleep so far as can be ascertained.

These attacks have been stereotyped now for the three months under observation. I have taken some cinematograph pictures, parts of which are here reproduced. As noted shivering tremors sometimes come on after some of these attacks. Rarely a day goes by without these.

For the first month no restriction was placed upon the use of hypnotics. She continued the use of her hypnotics and begged for something to give her sleep. Her usual sleep was rarely more than two to four hours a day.

The day's program was irregular but was approximately as follows: If she took her hypnotic—she would sleep from 10:30 at night to about 4 in the morning—then the breathing difficulties would begin. She would stay in bed until noon or 2 or 4—get up for a few hours, with slight sleeps in-between and again retire after supper.

Wishing to try out some pharmacological agents I gave her at various intervals, luminal, veronal, tr. hyoscyamus, scopolamine, hyoscine, tr. belladonna. The results were of great theoretical interest but were not of any therapeutic value. At one time a mixture of R. Veronal gm. .02, Tr. Hyoscyamus .01 q. 3 hrs. led to such a profound regression that the patient went almost into a drunken coma after three days medication. She could hardly be aroused and as she expressed it "felt heavenly." She clamored for more. I pushed it a trifle until the patient herself felt a little alarmed. Tr. Belladonna—which A. J. Hall speaks of as being of service, was of no use and scopolamine was worthless.

After three weeks of the drugs she consented to give up all drugs as she realized in a sense what she was after—speaking in terms of "Nirvana"—or the "return to the womb" in psychoanalytic terms, and she realized the significance of her regressive wish—but stated "she was so tired," she welcomed death.

In April, through the courtesy of Professor Twitmyer of the University of Philadelphia I obtained some pneumographic tracings and append his interesting report—and parts of the pneumographic tracing.

The subject was placed in the apparatus at 2:34 p.m. The pneumograph was applied to median frontal body on line of nipples. The lower tambour was placed directly beneath it, the center of the bag about two inches above navel. At that time the subject was undergoing an episode of breathing attacks as evidenced by breathing curves at point "1," and continuing to point marked "2," at which time it was our opinion that

perhaps we were getting the action of the lower intercostal muscles rather than diaphragmatic excursion, so the lower pneumograph was placed on the subject about four to six inches below the navel. Immediately there becomes evident a change in the form of the curve, the establishment of a higher base line probably to be interpreted as due to an involvement of breathing which causes the release of some of the residual air.

At points "3" to "4" a pulse reading was made on the girl and found to be 110, respiration 34 per minute and at the point marked "5" the subject was seated since she objected that she was feeling quite fatigued and the strain of the test was telling on her.

At point marked "6" was the first time that the girl showed any signs of calm and there was a slight cessation of terrific breathing occurring at points "7," "8" and "9."

At point "10" was the first time that we were able to get her quiet and this state we produced by supplying her with a book from which she read silently. Records show that there was a complete apnea, the cessation of breathing showing itself in almost a straight line for both diaphragmatic and intercostal muscles.

At point marked "11," the girl having reached complete exhaustion gasped several times quite audibly.

At point "12," she again resumed an apneic state, compensatory replenishment of breathing in evidence at points "13," "14," "15," "16," etc.

The record was completed at 3:10. The marks at the bottom of the record are the metric swings, the markings being at the rate of 60 per minute.

While my contacts with post-encephalitics has been somewhat restricted nevertheless Miss Y presents an unusual picture inasmuch as her breathing episodes are not accompanied by any mental departures. It has been my experience with previous cases that breathing spells or other mental disturbances seem to run *pari passu* with the respiratory disturbance. However, in her case throughout our examination she maintained a very pleasant and docile attitude. Her sense of humor, her mental alertness and her general behavior are not affected despite the fact that the physiological malfunctioning of the breathing mechanism becomes excessive. At one time she asked us to release the belt about her waist, that it was causing considerable annoyance and preventing her from breathing. Then she said that she would be most happy if she could yawn and relieve herself of the fatigue.

At several times after we had begun our work and when the curves were running quite high she was markedly cyanotic and once or twice rolled her eyes back, eyelids drooping, a spell definitely epileptoid in

character. At no time was her conversation incoherent or were there any other evidences of aberration or hallucination or other abnormality, and no period of unconsciousness unless the transient epileptoid attacks to which we refer are moments of unconsciousness comparable to petit mal. In order to afford a temporary respite from the breathing disturbances I asked her to attempt to vocalize, utilizing some vowel sounds as a medium through which to discharge the breath. This exercise is similar to ones which I employ in orthogenic speech work. This afforded her considerable relief, controlled the breath and momentarily synchronized the movement of intercostal and diaphragmatic musculature.

PART III
PHENOMENOLOGY AND PATHOLOGICAL
CONSIDERATIONS

A complete analysis of the phenomenology of this disordered type of respiratory behavior will not be attempted here. Such would involve physico-chemical, physiological and psychical considerations, utilizing the level hypothesis originally suggested by v. Baer in his recapitulation theory, favored by Hughlings Jackson, more completely elaborated by v. Monakow and followed by Jelliffe and White in their *Diseases of the Nervous System* (see Introduction, Fourth Edit., 1923).

Physico-chemical studies along these lines are certainly as yet quite incomplete, important though they may be, especially for the understanding of a number of metabolic phenomena observed in these encephalitis cases. The knowledge of the highly intricate correlations of vegetative neurology and metabolism variations are but in their beginnings in the study of the *Biology of the Individual*.¹

We here contemplate but a brief review of certain pathophysiological situations and a tentative entrance into the psychical coordinates in the effort to bring a possible monistic attitude to bear upon the comprehension of the picture of the *respiratory behavior*.

Inasmuch as the mode of approach is dynamic rather than nosological such terms as hysterical, degenerate, dementia, psychopathic, etc., are of no particular significance here.

In previous pages I have tried to give a résumé of the chief available studies. I do not claim to have found them all, but those quoted are the essential ones. Some of these are of special value for our problem in that the respiratory movements have been observed in greater or lesser detail and graphically represented by the methods at present in vogue. They are naturally very uneven in their detail.

The earlier studies concerned themselves with the acute respiratory syndromes. These are here put aside for the consideration of the residual or chronic forms with which this study deals. These acute

¹ Brugsch u. Levy. *Biologie der Person*. Urban & Schwarzenberg, Berlin and Vienna, 1926. Laignel-Lavastine. *Pathologie du Sympathique*. Alcan, Paris. 1924. Jelliffe and White, *Diseases of the Nervous System*, Ed. 4. Pottenger, *Symptoms of Visceral Disease*, 3d Ed. Adolf Meyer, L. F. Barker, etc.

manifestations are not to be neglected by any means as many pathological studies show that death has resulted from involvement of the essential respiratory neural mechanisms (Goldflam et al.), and hence, inferentially, in the residual respiratory disorders which are strictly homologizable with the acute respiratory syndromes, some impingement upon these complicated mechanisms must be admitted as playing a part in the residual types under specific consideration.

Furthermore it is believed that the muscular anomalies of respiration are in many ways to be coördinated with other muscular anomalies of the larger encephalitic syndrome. Achard (p. 57) has drawn attention to the similarities of myoclonic diaphragmatic breathing to other myoclonias. Similarly Cheyne-Stokes breathing with its usually lethal outcome and Mendicini's interesting initial pneumographic study of breathing anomalies in the acute stages show striking similarities in the residual syndromes. Thus Reys¹ in his interesting study has called attention to the myoclonic expiratory form as a residual in a succinct manner paralleled in our Case 2.

Turner and Critchley, to first take up the most recent of the studies in the respiratory phenomena have followed G. Lévy's classification with slight modifications. Thus:

(1) *Disorders of Respiratory Rate (Tachypnea and bradypnea).*

In Lévy grouping. (1) Respiratory Disorders proper. Alterations of rhythm—polypnea chiefly (tachypnea is preferred by T. & C.) bradypnea, apnea, accessory periodic respiration.

(2) *Dysrhythmias or disorders of Respiratory Rhythm (Cheyne-Stokes, breath holding spells, sighs, forced or noisy expiration, inversion of the inspiration-expiration ratio).*

(3) *Respiratory Tics (Yawning, hiccough, spasmodic cough, sniffing).*

Any combination of the above types may co-exist with or without the other sequels of encephalitis (T. & C.). To this we agree save that we have yet to observe a single case of pure respiratory disturbance which does not show some one or more of the now accredited to be "encephalitis" signs. Should we find such a respiratory syndrome absolutely pure we would not necessarily exclude an "encephalitic" causal factor but would be inclined to hunt psychoanalytically for a characteristic psychogenic goal and hence ally such a case with the purer symbolic (psychogenic) types.

¹ Reys, L. L'Encéphalite epidémique. Maloine, Paris, 1922.

Bériel's study, elaborated in Hardoin's early thesis (1921) affords us, historically, with the first intimation of explanation of the altered breathing, hence we will discuss micropnea before polypnea. After illustrating respiratory tics, they speak of a special form of *micropnea* in parkinsonian cases in which the respirations are rapid and superficial the diaphragm alone being in activity. There is no paralysis and Hardoin says neither central nor peripheral neural processes are involved. The essential feature is the thoracic rigidity which is allied

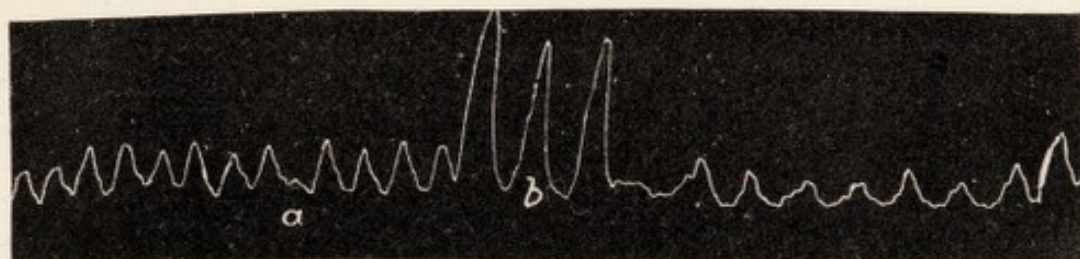


Abb. 4. (a) Mikropnoe; (b) Seufzer.

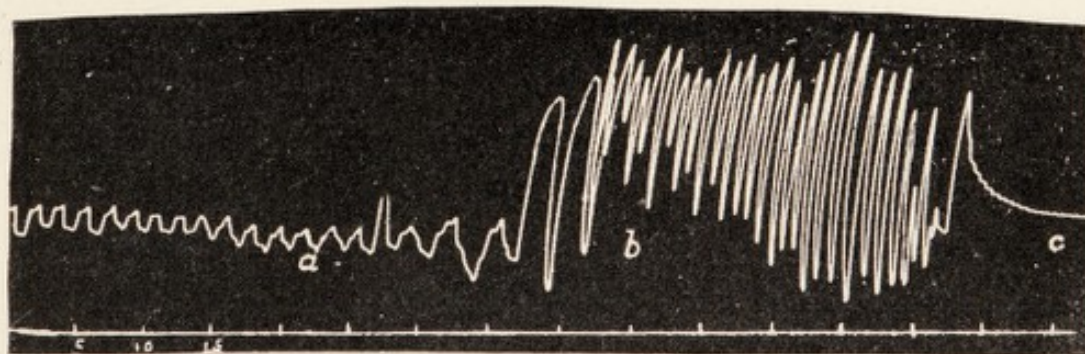


Abb. 5. (a) Mikropnoe; (b) Tachypnoe; (c) Apnoe.
Characteristic respiratory curves (Suckow).

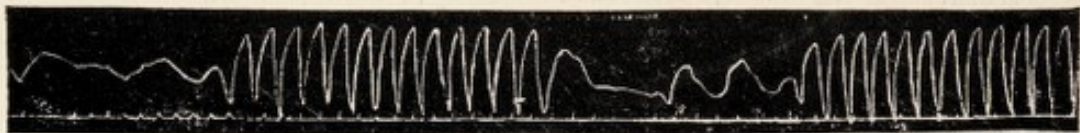
by them with parkinsonian rigidity. Furthermore the tic-like brusque movements Hardoin correlates with a diaphragmatic myoclonic spasm or an accident of compensation arising in the course of the micropnea. These are related by him to some somatic disturbance. Gamble, Pepper and Muller's interesting experiment, already cited, make this improbable. Suckow's interesting paper further illustrates this micropnea in alternation with tachypnea, apnea, and with yawning episodes (see illustration).

Bulbar involvements are not probable; paralyse of the intercostals, diaphragm, pneumogastric are equally to be excluded. Superior centers of coördination such as lie in the corpora striata

may possibly be involved but the author passes this by lightly and formulates the hypothesis already mentioned that of thoracic rigidity of a nature allied to parkinsonian rigidity. Radioscopic study showed complete immobilization of the base of the thorax. Thus as Bériel has pointed out other micromotor syndromies find their analogues in this micropnea, micrographia, minimal movements of the jaws, and other associated micromuscular activities. (Compare Suckow's studies.)

The acceleration according to Bériel is a compensatory process founded upon oxygen need and therefore the diaphragmatic exaggerations are in liaison with the thoracic fixation. Bulbar implications are not of help in the explanations, but Hardoin admits that higher coördinates—corpora striata—may be implicated.

Bériel and Hardoin's point of view has partial validity for



—*Polypnée permanente*. 48 respirations par minute. Raccourcissement de la période d'expiration. Disparition de la polypnée et même ralentissement respiratoire pendant l'écriture.

Mlle. G. Lévy's illustration of persistent tachypnea. During writing the breathing alters, as also see Hardoin's curves of change in breathing during swallowing (Lévy, fig. 31, p. 142—Doin).

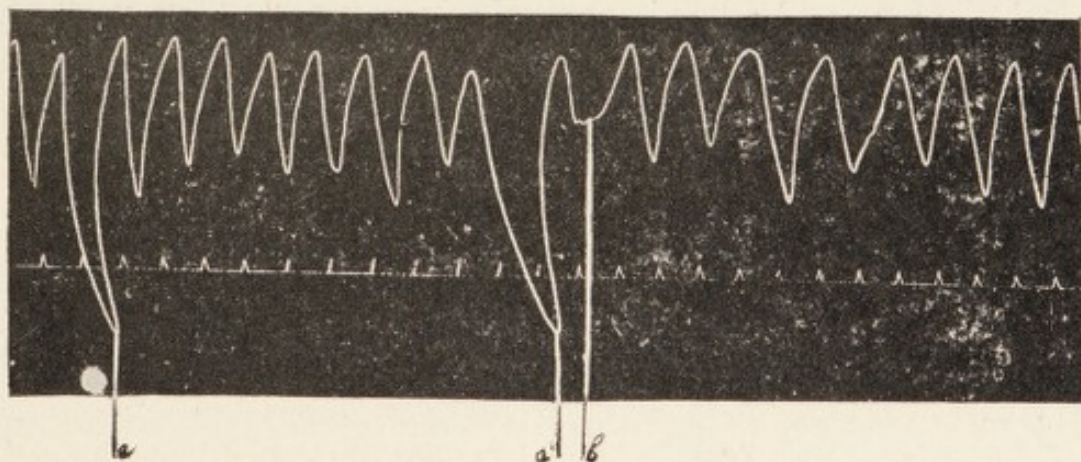
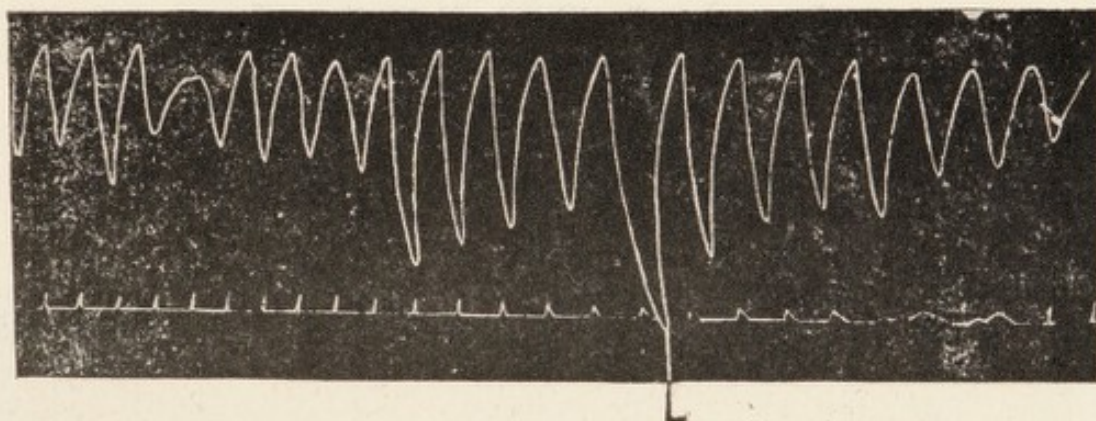
certain of these cases and is concurred in. It is certainly a part of the present task to learn if possible more of the complex mechanism of respiration not only in its purely oxidative function but also as to the relations of chest and diaphragmatic movement as carriers for higher symbolic equivalents with which we are fairly well acquainted in their speech mechanism activities.

Laignel-Lavastine and his assistants have also demonstrated an asynergia in the automatic respiratory movements with a dissociation between the right and left halves of the diaphragm.

Tachypnea. Turner and Critchley discard Lévy's much used term *polypnée* entirely although they follow her general descriptive outline.

Tachypnea (T. & C.), *polypnée* or *tachypnea* (L.) is the commonest of the respiratory anomalies—(the most important—L.). It may be permanent or paroxysmal, during sleep or only during the waking hours. We have observed both but in cases I and II here outlined it was present only during the waking hours—save in a few instances of half sleep when it was continuous in both the cases here reported.

Turner and Critchley state there may be no cyanosis—in both of the cases reported by us here there were apneic periods with cyanosis and most of the case histories here given in abstract report the occurrence of an apneic phase with trance-like states or semi-unconscious phases. Turner and Critchley speak of the patients usually suffering no inconvenience. Such has not been our experience



Irregular tachypnea with sighing, deep dip in graphic. In lower figure tendency to irregular breathing with sighing. Same patient as previous graphic (Lévy, *Manifestations Tardives*, figs. 31, 32, p. 143).

in the numerous cases we have seen in various countries and in various clinics, where nearly all have complained of great inconvenience and of *intense effort trying to get their breath*.

The fixation of the chest as observed by Bériel and Haroin obtains according to Turner and Critchley in the parkinsonian cases only. Such also has been our experience. It is notable in our Case II.

Paroxysmal (polypnea) tachypnea according to Lévy is the most frequent type—this has been our experience and the historical résumé bears this out. Lévy lays stress upon the “towards evening” occurrence of these attacks and Turner and Critchley speak of it also,

when the attacks may last from a few minutes to several hours. In the cases here abstracted no determiners were really intelligently sought for. Lévy states that this evening oncoming situation was particularly true for children and often lasted all night. Our own experience has not dealt with children save that the psychical reduction universally present makes all of these patients children. That certain symbolic determiners are present is our belief; of this later.

The breathing attacks according to most observers are under some sort of voluntary control. Emotional stimuli are of much moment in inducing or modifying them. Turner and Critchley state that eating may stop them (see Hardoin curve for deglutition). In our cases I and II eating time was a particularly efficient stimulus in

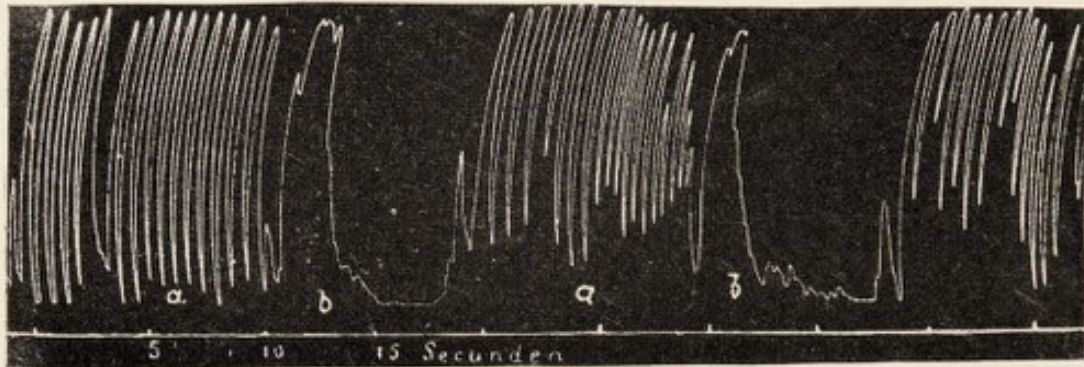


Abb. 7. (a) Tachypnoe; (b) Apnoe.
Type of alternating tachypnea and apnea (Suckow).

inducing them. Paroxysmal or permanent tachypnea seem to be quantitative grades in our experience. As the patients recover, for reasons as yet inexplicable (save for those here advanced as for some recoveries) the permanent types tend to give way to paroxysmal types, and such a course argues for beginning partial or complete recovery. Turner and Critchley call attention to Buzzard's observation concerning the dissociation of many complicated activities in encephalitis during which purely automatic activities such as swallowing, speaking, breathing, etc., seem to be split and only become possible under directed voluntary activity. This feature of functional dissociation is of much significance from the genetic point of view of behavior to be here developed more in extenso.

Attention has been called to the tetaniform complications of the hyperventilation of the lungs in the paroxysmal and permanent tachypneas. The observations are old although Barker and Sprunt would speak of their findings as new. These have been dealt with in the opening paragraphs of this résumé and inasmuch as it bears

specifically upon the chemical problems involved cannot be entered into here even though we are inclined to feel that far reaching situations are involved.* Adlersberg and Porges have offered an introductory chapter into this and it must be left here.

Our case II offered an exquisite example of what has been described as a persistent tachypnea—yet here it was evident that periodicity was present. Our reading of the many cases tends to make us believe there is no really permanent tachypnea. Even in the cases cited by Lévy and in her pneumographic traces there is evidence of a certain periodicity. There is a rise and fall, and attacks can be separated even though the interval seems slight at times. Suckow's tracings show some very striking alternate apneic and tachypneic attacks.

In our case II which is one of the most severe we have seen there would be 5-, 10-, 15-minute intervals between attacks—appar-

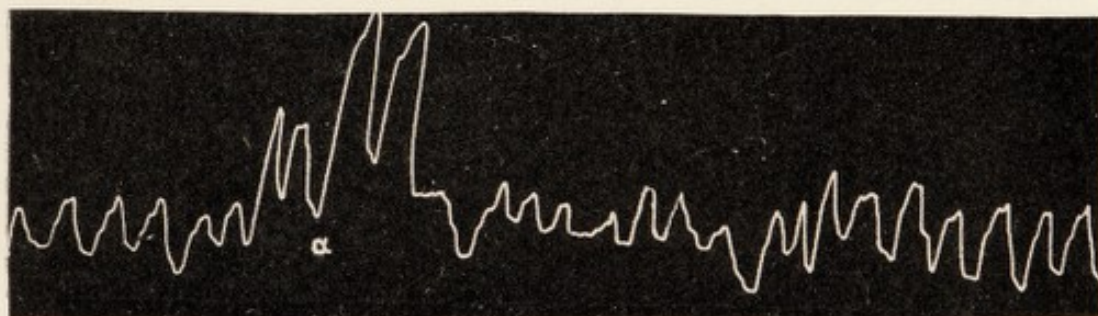


Abb. 2. (a) Seufzer.
Sighing, yawning respiratory curve (Suckow).

ently related to diversion or other incidents. Here chiefly the attack would terminate with one or more deep yawns—which were accompanied by a feeling of deep satisfaction. Failing such satisfaction the breathing would go on. With a satisfactory deep yawn after several smaller ones—the patient would either enter an apneic phase with increasing cyanosis or be free for a while—(the psychoanalytic correlation with an orgasm [sialorrheal or leucorrhoeal discharge] was quite evident in this case and will be discussed later).

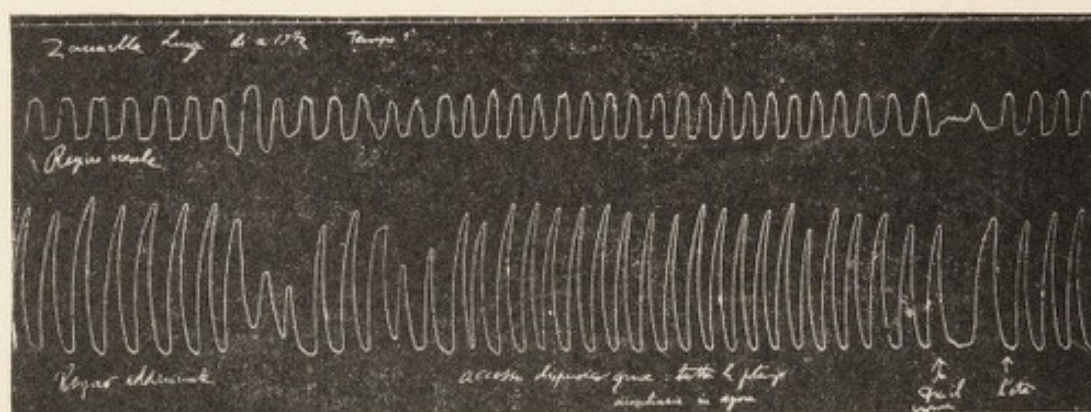
Lévy groups these sighing, yawning episodes with the tachypneas: Turner and Critchley speak of them as belonging in their second group. To us they belong with the whole unconscious mechanism and are of special significance when one views the whole situation teleologically. As no one but ourselves, Witzel and Runge have dealt with this phase of the pathopsychophysiological situation we reserve

* See Kraus, F. *Klinische Syggyologie. Der Fiefen Person.* Berlin, 1926.

our discussion of these until later and will here indicate the descriptive phases only.

Turner and Critchley speak of these sighs as extremely frequent. Suckow has dwelt upon them at length. Most observers describe them as occurring in normal breathing followed by a short period of compensatory expiratory apnea. This apneic situation is to us of great psychological significance especially when considered from the psychoanalytic viewpoint of early libido distribution between breathing and sucking in the infant. Turner and Critchley speak of them as occurring only during sleep or following slight exertion. This is not our experience.

Tic-like grimaces (T. & C.) spasms (L.) are noted. "Shivers"



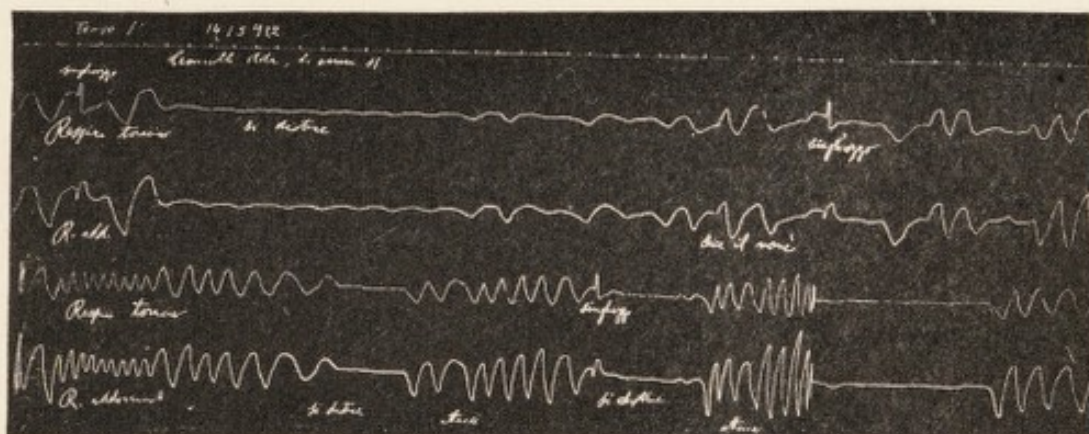
CASE 5. Frequent, panting, irregular breathing correlated with psychical factors of distraction or of stuporous make believe (Bilancioni et Fumarola, p. 22).

were present in both of our cases—and homologized to the involuntary "shudders" often experienced when the bladder is emptied, etc. (orgasmic analogues—envisaged by us).

Apneic phases are well described by Turner and Critchley and by Lévy, Bilancioni and Fumarola and were marked in our patients. With our cases they are clearly homologized with "unconscious" situations of rapt attention—"trance" (B. & F.) and our analysis shows their homology with enraptured and trance states as seen in narcoleptic, hypnoleptic, cataleptic, pyknoleptic, epileptic situations. Here are a series of dissociated phenomena of great interest and complexity which run back to infantile fixations of rapt interest—in which artistic intuition of the significance of the "Transfiguration"—"Danae"—"Leda and the Swan" not to mention many variants from the upper reaches of spiritual transport to the lower grades of erotic behavior are to be evaluated.

It is not to be inferred that such trance-like states are necessarily so correlated. In common sense terms "every tub stands on its own bottom" and hence only detailed study of the individual patient can determine the exact situation. Our own attention has been directed to such individual teleologies and of these we shall speak later.

Irregular respiration, bigeminal and trigeminal, dissociated costal, thoracic, nasal, or laryngeal types are frequently met with. It is probable that these modifications each in turn have their special significance.* Van Bogaert has studied these minor variations here in detail and speaks of alternating types as well as bigeminal and trigeminal types. Our own experience shows that all of these



CASE 9. See previous tracing. In this period the patient falls easily into a stuporous state, semi-ecstatic, in which the respiratory movements are reduced to a minimum. In the two lower graphic tracings the patient shows frequent attacks of dyspnea alternating with pauses, the former arising without apparent cause (Bilancioni e Fumarola, p. 40).

types are present but rarely in any stereotyped form. The gradual running down of a breathing attack is often very striking. Van Bogaert has charted some of these and shows that bigeminal and trigeminal breathing often issues in the apneic phase of an attack. Our cases frequently showed this. Van Bogaert speaks of changes in the tachypnea occurring from changes in position.

The personality make-up is probably of considerable significance. There is little available evidence upon this point but students of speech, of singing, etc., are well acquainted with such variations as pertaining to such backgrounds. Bilancioni and Fumarola's important contribution discusses these laryngeal and related features extensively.

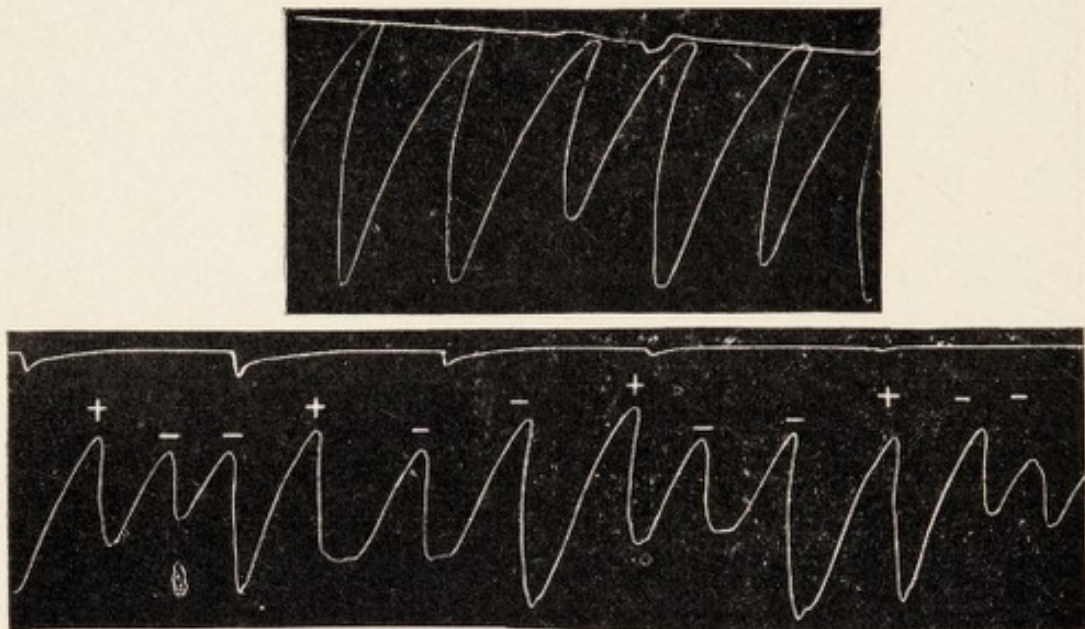
In our case II for instance the prolonged expiratory phase corresponds with other breathing situations. She always had a tendency

* In American slang, "Every little movement has a meaning all its own."

to discharge her speech, explosively, and this feature is quite pronounced when she would smoke a cigarette. Whereas in many individual smokers, inhalation is most pleasurable, with her strong exhalation was the preferred type of activity.

As one studies the many pneumographic tracings on record these irregular types are plainly in evidence, at times in almost all cases, even though a predominant breathing pattern tends to be followed in each individual. Bilancioni and Fumarola's tracings are especially interesting from this angle. Two of them are here reproduced.

Turner and Critchley emphasize breath-holding episodes. They here refer to those who hold the breath in deep inspiration. "These



Respiratory arrhythmia with alternating type above and below fragment of a trigeminal type (Van Bogaert).

paroxysms are ushered in by a series of deep, forced inspiratory efforts with noisy expirations: the patients feel dizzy," or as if there were something in the chest interfering with full inspiration. A very deep inspiration is then taken and maintained for a period of ten, twenty or thirty seconds. Choreo-athetoid movements, grimaces or bizarre movements may accompany these. Sometimes consciousness is cloudy during such as in their cases 1 and 5 and our case I.

Our own cases showed a partial reversal of this formula. The patients simply stopped breathing. Case I would go into a trance sometimes lasting a long time, 5 minutes with cyanosis, cold extremities, tetaniform cramps in hands and feet and as recorded a

few almost epileptiform states. Case II would stop breathing, become cyanotic after a few great yawns, then after 5 to 30 seconds start on her labored breathing. If the yawn was "satisfactory" the apneic phase might be omitted and she would talk for from 5 to 15 minutes, sometimes even longer, and then another paroxysm would supervene. With her there was some subtle interrelation between something obtained by the yawn and by the apnea. The better the yawn, the less the apnea. Shivering attacks sometimes would follow an apnea, but rarely occurred when there was a good yawn.

A somewhat similar series of displacements was also seen in case I. The wish to micturate and these shivering attacks were in some way correlated as well. Lévy (p. 145) has called attention to involuntary micturition in one of her cases associated with spasmodic cough. Case I of our series would go to the toilet after a severe breathing spell. Wimmer's case 12 (p. 73) had nocturnal enuresis for many years previously.

The behavior of other patients during these breathing spells deserves a special chapter and cannot be here detailed. Only Runge's case will be cited in that the attempt to strangle himself should be brought into relief as possibly throwing some light upon the apneic situation. As apnea might be thought of as a special mode of strangling (self-destruction wish), Runge's theological student with his "ideas of sin"—also present in our case II in a modified manner—is thought of as deserving special comment and possibly to be related to the psychopathology of certain of these cases.

The Roch-Schmidt case who tried to hide, and others who banged themselves on the floor might also be brought alongside of the regressive suicidal wish-phantasy situation. Runge's case is deserving of more extended study here and also Hauptmann's extensive autobiographic case.

A final word may be said concerning the minor respiratory phenomena classed by Lévy, Turner and Critchley and others as tics. Bignami¹ as early as 1920 drew attention to these and allied them with the Dubini's electric choreas.

Zingerle² and others, as already noted, have allied them with diaphragmatic myoclonias. Since this enters into the large group of hiccough cases (see Wimmer, p. 73) with Turner and Critchley

¹ Bignami, A. Sui rapporti tra la corea elettrica di Dubini e la encefalite letargica. Riv. Osped. X, 1923, 527.

² Zingerle, H. Beitrag zur Kenntnis des extrapyramidalen Symptomencomplex. JI. f. Psychol. u. Neur., 27, p. 166.

we leave them with a mention only save noting the interesting myoclonic diaphragmatic tic case of Gamble, Pepper and Muller.

Other nose sniffing and mouth blowing tics are also omitted full mention here. Lévy, Francioni, Parker, Babinski and Charpentier and others note them. The nose sniffing attacks were very pronounced in our case I and led to a nasal operation.

Wimmer (p. 70 et seq.) has dealt with them quite clearly. He speaks of constant sniffing, hawking and spitting. Noisy puffing and hissing or snorting through the nose or mouth, paroxysmal or phasic. Serial yawning or sighing, sighing and hiccoughing. Wimmer's case 12 (p. 72) had as already noted pronounced yawning attacks antecedent to a tachypnea. She had jerky fits as many as 20 a day—later 135—and her tachypnea would rise to 70 noisy respirations to the minute. This case is further of interest in that it was preceded by hiccoughing attacks a year previously.

Isolated yawning attacks have also been recorded by many observers. Our case II is a classical example (see Figs.) also Turner and Critchley's case 2 (see p. — in present contribution) and cases by Abrahamson, Buzzard, Howell, Pardee, Mayer and Saussure, Sicard and Paraf, Wimmer and others.

Whooping cough like attacks were studied by Marie and Lévy and others and are noted as introductory to later respiratory difficulties by many authors—see case I of Turner and Critchley.

It is often stated that these tics may occur as isolated but closer study nearly always reveals other respiratory situations. Many observers fail to mention any of these tics. As Turner and Critchley note possibly they were not looked for.

Bilancioni and Fumarola, Lévy and many others refer to the "hysterical" "pithiatic" hysteriform (Wimmer) nature of these phenomena and Lévy devotes some pages arguing as to their "organic" nature. Most authors seem steeped in the parallelistic or dualistic doctrines of old time neurology. Inasmuch as this type of presentation does not appeal to us, since here the psyche is deemed as old as the soma and one, the discussion of the pathogeny problem involved is here touched upon to be discussed more in detail later.

SOMATIC PATHOLOGY OF THE RESPIRATORY SYNDROMES

In view of the great diversity of the phenomena already envisaged as respiratory it is illusory to hope for any monistic interpretation as to pathogeny. This situation has been emphasized for the larger

encephalitic syndromy. It is equally true that even the respiratory phenomena are complex, in spite of the limitation of the field of observation. The statement of Turner and Critchley that "at the present time the discussion as to the causation of the postencephalitic respiratory disorders becomes purely speculative" can be better expressed by saying that, certain of the phenomena can definitely be run down to definite lesions—notably the Cheyne-Stokes breathing, so often seen in acute situations and persisting at times partly modified into the later stages—whereas at an opposite pole definite psychogenic factors can be seen to be operative as the results of diaschitic splitting or dissolution of function due to partial involvement of higher cortical reflex pathways. Until more is known of cortical pathocclisis the structural correlates here will remain unknown. Pathogenic interpretative formulae for intermediary situations, possibly seen statistically as preponderating, remain as Turner and Critchley well state, undetermined, by reason of a multiplicity of factors, hence speculative.

A historical review of the general situation brings out the complications surrounding any monistic interpretation. Turner and Critchley deal with four of these as follows:

(1) *Peripheral origin hypotheses.* Bériel, Hardoin, Vincent and Bernard, Laignel-Lavastine (diaphragmatic dissociation), and others.

(2) *Various thalamic hypotheses.* Here the afferent stimulus is thought to be blocked and thus the phenomena are brought in line with the thalamic sleep hypotheses. (Jelliffe et al. for sleep.) Pardee as a suggestion merely for the respiratory phenomena described by him.

(3) *Bulbar localizations.* Definitely shown in severe involvements, Goldflam et al—for specific types—Cheyne-Stokes, etc., and assumed for attenuated forms Roch, Rosenow and others.

(4) Turner and Critchley advance the situation a bit and include *higher psychomotor tract involvements* which will be here discussed as relevant to the general dissolution of function aspects since respiratory function as such is known to have voluntary cortical regulatory mechanisms.

(5) Furthermore the larger mechanism of respiratory expression—*emoting* functions, which are of so much importance in the higher psychical activities of speech behavior should be included—and

(6) Still further attention should be directed to those coördinating pathways which sweep up *visceral components* into the thalamus, striatum and cortex for the body as a whole in its emotive synthesis.

Diaschisis here while as yet unanalyzable to our complete satisfaction may be reached for when the entire respiratory syndrome is reviewed as an aggregate.*

(7) Finally it seems not inopportune at this juncture to bring into the discussion certain *metapsychological* points of view which the conceptions of the Super Ego, the Ego, and the It as formulated by Freud and the psychoanalytic school in their studies of the traumatic neuroses, the conversion phenomena, substitution phenomena, organic psychoses and organic disease itself.

It is probable that in this or that individual that one or all of these factors can be brought into relief and contribute some light to this highly complex series of phenomena.

It is a commonplace in the casuistic material to find organic involvements of liver, intestines, skin, kidneys, appendix, pancreas (diabetes), hypophysis (obesity), etc. These visceral implications must have their reverberations in the central organs of the Ego, metapsychologically considered, just as in a gross metaphorical sense, the captain of a ship knows where something is wrong with his machinery or his crew working the same. Psychotic splitting is so frequent as to raise the issue, why? and what is its function? Repetition compulsive phenomena (stereotypies, palilalia, etc., etc.) are equally prominent. The entire literature is shot through with the lazy and inadequate summary of "hysteria," *i.e.*, conversion phenomena, as viewed psychoanalytically, and the hospitals are filled with patients whose behavior resembles that of the picture of the traumatic neuroses, in some of which the respiratory phenomena, particularly at certain periods, show the characteristic anxiety neurosis phenomena of the Freudian formulations.†

Whereas it is recognized that this "classificatory" partitioning of the material is but a logical artefact yet the scientific method as such is reduced to the utilization of such fictions in order that analysis and synthesis can be brought about for pragmatic purposes in the handling

* Weinberg, A. A. Psyche u. unwillkürliches System. Zeit. f. d. g. N. u. P. 85, 543, 86, 375, 93, 421.

Küppers, E. Ueber den Ursprung und die Bahnen der Willensimpulse. Zeit. f. d. N. P. 86, 1893, p. 274.

Goldstein, K. Zur Theorie der Funktion d. Nervensystems. Arch. f. Psych. 74, 1925, 370. Ueber den Einfluss motorischer Störungen auf die Psyche. D. Z. 85, 1924, 119.

† Bychowski, G. Psychopathologische Untersuchungen über die Folgezustände nach der Encephalitis epidemica, insbesondere den Parkinsonismus. Zeit. N. P. 83, 1923, 201. *Ib.* Metaphysik und Schizophrenie. Abhand. N. P., No. 21 Karger, Berlin, 1923.

of individual cases. I need not unnecessarily dwell upon this old Protagorean-Socratic series of antitheses between particulars and universals which has been the battling ground of the philosophers from time immemorial.¹

(1) *Peripheral (Muscular) Origin Hypotheses (Fictions)*.

These are not "theories" as others have termed them. It is doubtful, following Vaihinger, whether they have even the validity of hypotheses, but it will serve little purpose at this place to split logical hairs of scientific method.

As already indicated Bériel and his pupil Hardoin, in his thesis elaborated the notion that the tachypnea was a compensatory phenomenon to make up for the micropnea which was conditioned by a striatal rigidity affecting the intercostal muscles. As Turner and Critchley correctly observe this cannot be true for all the cases since in a number no such parkinsonian rigidity exists in the muscles.

Our own observations—in addition the two cases here reported as paradigmata—tend to show that the Bériel-Hardoin observations have considerable validity. Most of the cases seen by us have had a certain grade of this "rigidity"—*i.e.* static tonus, but it is here regarded that this increased breathing is not a reflex phenomenon solely conditioned by the hypertonus, but rather the view is held that *both* the breathing *and* the tonus have a more unitary conditioning. Thus the hypothesis is not a peripheral one but is more complicated and thalamic and striatal pathogeny are involved. What this may be will be discussed under the general heading of an ego defense mechanism (postural attitude) which takes into consideration a number of inimical organic offenses, from other organs than the respiratory ones alone.²

Turner and Critchley include here the diaphragmatic myoclonic movements—really referable to the "tic" types. These myoclonic situations—epidemic hiccough, Dubini's electric diaphragmic choreas, etc., while manifestly of muscular origin do not properly belong here. Gamble, Pepper and Muller's phrenic freezing experiment seems to show that the synapses of this nerve are involved in the reflex chain in these myoclonic diaphragmatic tics.

¹ Compare: Lange—History of Materialism, and Lewes—History of Philosophy. Chapters upon the Atomists, Sophists, Socratics, and Platonists.

² This statement would lean heavily upon Wilson's clear outline of the difficulties in his "The Old Motor System and the New." Arch. Neur. & Psych., 11, 1924, 385, in which the problems are clearly envisaged as to their complexity, not to mention a host of related studies—Ramsey Hunt, Lewy, Jacob, Vogt, Magnus, et al.

(2) *Thalamic Hypotheses.*

Our own observations tend to show that thalamic involvements are very frequent and register themselves early in the lethargic features of the general encephalitic syndrome. (Certain pharmacological agents, particularly of the alcoholic series—chloral, veronal, trional, medinal, have induced deep sleep and a marked cessation of the respiratory disturbances. Just what deductions are to be drawn from these still remain for further study, especially in view of what Schilder writes in his *Lehrbuch der Hypnose* about medinal poisoning experiments and changes in the central grey of the III ventricle which has vegetative functions, maybe re sleep as v. Economo's hypotheticals.) Direct associations between the respiratory situations and the thalamic implications are undoubtedly present in many cases. Careful consideration of the Dejerine-Roussy, Head-Holmes, studies upon thalamic-cortical interrelationships relative to the handling of the afferent impulses from implicated extero and interoceptors leave a number of thorny problems to be more carefully studied.

It seems still open whether the thalamic hypothesis is a main situation as now conceived. It must be left for a special study of how these patients handle the specific incitors of their attacks. Thus in case I certain suggestions have been advanced relative to specific incitor factors as operating to induce or to control the discharge which has been narrowed down to the respiratory apparatus—operating at low ontogenetic levels.¹

When it is firmly held in mind that all movement, whether automatic or voluntary, implies response to stimuli, external or internal, either conscious or unconscious, the possibilities of handling by the thalamus or by that of its sensory homologues at the same level are not too easily dismissed. As one reads the earlier studies of Gerstmann and Schilder, then those of Förster, of Böstroem, Wartenburg, Cruchet, Wilson, Gamper and Untersteiner and many others, it has become more and more evident that certain definite behavioristic patterns appear either in pure culture, as it were, or mixed with other patterns. At times these patterns have been isolated—Wartenburg's studies upon athetosis and upon torticollis may be cited among others—while particularly noteworthy are the observations of Gerstmann and Schilder and their confreres, the study of Böstroem and the most neatly analyzed case by Gamper and Untersteiner.² Here was a

¹ Consult v. Economo's very suggestive study, *Ueber den Schlaf*. Springer, 1925.

² Gamper and Untersteiner, *Arch. f. Psych.*, 71, 1924, 282.

complex group of movements which, briefly indicated, started with a mouth opening, turning of the head towards one side and a series of compensatory torsions to meet the original mouth stimulus. The authors analyze it on the basis of a yawning reaction and then pursue it further as a reflex response to an oral stimulus such as occurs in nursing. They show that the whole movement is but an extensive spreading from this original sucking stimulus. They offer no introspective material upon this point, as is believed necessary from the viewpoint maintained here, but the purely behavioristic analysis is so strongly confirmatory of the point of view here advocated—*i.e.* the dissolution of function to earlier levels of behavior.

Here it is evident that the initial sensation starting in the mouth undoubtedly reaches the thalamus, and from here on—as with the Head and Holmes series, an exaggerated and diaschitic response is released in the form of an isolated pattern. It seems highly probable then that careful histopathological scrutiny of the thalamus and its homologues will be fruitful. This has already begun but cannot be discussed further here since it is all too general.

Tilney and Casamajor¹ have attempted the analysis of the isolation of these bits of patterned muscular response (automatic associated control) in lower animals by the myelogenetic method and their work is here conceived of as of great importance in the field now under revision.

(3) *Medullary and Higher Localizations.*

It is not at all surprising in view of the many cases of respiratory death with definite lesions microscopically observable (Goldflam et al.) that most observers have looked upon the respiratory difficulties in the postencephalitic as attenuated types of such medullary-bulbar implication. Here two conflicting series of observations stand out. In the one the respiratory difficulties have been developed directly out of or were continuations of the early stages of the respiratory phenomena. Should one reread the many observations here recorded it will be seen these were in the minority. On the other hand the post-encephalitic respiratory difficulties have supervened many months after the initial difficulties. In many, it is true, that the interregnum has shown many sniffing, hawking, coughing “bridges,” yet the purer types of tachypnea, regular or irregular have seemed to become consolidated often many months after the original difficulty. It is of interest to note that Wimmer in his very masterly study follows

¹Archives of Neurology & Psychiatry. 1925.

v. Economo and others and has repeatedly called attention to reinfection or persistence of subinfection to account for the advance in the symptomatology of these post-encephalitic cases. While we believe there is no definite proof to show that this is not so and possibly none in its positive favor, the point of view here outlined is that this conception must be set alongside of or possibly in opposition to the view that *regression of function* through focal disease elsewhere is of significance, and furthermore the whole problem of dynamics is opened up. We mean by this that minimal focal disorder may raise a threshold so that the energy flow, by regression, psychologically considered, may take other pathways for its discharge. In a sense analogous to the use of a single switch line when others are blocked.

Degradation of function through relative disuse is seen everywhere in human pathology and it will be one of the features of this review to accent this well known principle especially as it calls for a larger therapeutic ingenuity than the more or less fatalistic attitude of "progression of a disease process through reinfection."

Personal observations have shown repeatedly very marked functional regression in the respiratory syndromy especially during some intercurrent disturbance. Thus case II is markedly worse during a menstrual epoch and also during a tonsillitis. Note has been made of the breaking out of the respiratory syndrome following a tonsillectomy in case I, and I have gathered a number of observations showing marked regressive behavior disturbances of the schizoid type in postencephalitics also following tonsillectomy. Hardly can it be argued seriously that a tonsillectomy can constitute an advance of the infection or a reinfection but it can be legitimately considered as a factor making for regression.

To cite but two bits of evidence from many bearing upon the increased susceptibility of these patients. One study of Appelroth is of interest.¹ This investigator has shown a marked increase of stimulus reaction on the part of the skin of the postencephalitic to X-rays, while an interesting study by Beringer² demonstrates that muscular strain may bring about a distinct advance in the post-encephalitic syndromy. These lines cannot be followed further here although they merit specific consideration.

Such regressive activities are widely observable not only following external stimulus such as the light stimulus in Appelroth's case,

¹ Appelroth, *Strahlentherapie*, 18, 1924, 593.

² Beringer, *Klin. Woch.*, 3, 1924, 2058.

or the fatigue brought out by excessive exercise, or following an infection or a toxemia. They are observable in the postencephalitic behavior disorders, respiratory as well as other types of behavior, from the slightest and subtlest of purely psychogenic stimuli.

It is a commonplace of modern day, even of ancient time psychiatry, that the sick individual was more than keenly alive to his surroundings. In present day terms the uncannily wise unconscious has come through the resistance of the repressing superego mental system and comes into direct intuitive contact with the surroundings.

Like the so-called sensitive "medium" they "divine" inimical forces about them. As the lower animal that feels the intonation quality of the master's voice, so, not only the psychotic but the postencephalitic, is keenly alive to the most silent of influences. The slightest frown of a parent is enough to raise the devil in the behavioristic response. It does so with the respiration as well.

This whole problem of the relationships between the psychical and vegetative processes cannot be entered into here, but the encephalitic syndromy has forced it into great prominence, at the same time offering much of importance in the analysis of the complicated processes involved. One aspect of this is taken up later.¹

To return to the medullary and higher localization hypotheses one can turn to Turner and Critchley's excellent résumé, as well as Wilson's² study unless a complete review of the entire respiratory mechanism is attempted. This would require a monograph and more knowledge than I could ever hope to acquire.

The earlier students, says Turner and Critchley, following Wilson, place this respiratory center at various locations in the central nervous system.

A rapid glance at the cinematograph reproductions of the respiratory behavior in case II will emphasize the participation of the facial musculature. Hence Wilson's discussion of this aspect of respiratory behavior may be quoted in extenso since it falls in line so neatly with the underlying thesis of this presentation. Wilson writes:

"The physiological association of facial and respiratory musculatures in the expression of emotion scarcely calls for any comment,

¹ The interested reader will find much of interest particularly in the study of Hess, *Ueber die Wechselwirkungen zwischen psychischen und vegetativen Funktionen*, Füssli, Zurich, 1925; Küppers' studies chiefly in the *Zeit. f. d. g. Neur. & Psych.*, 75, 1922, 1, 83, 1923, 247 and later, and Lotmar, *Die Stammganglion und die extrapyramidale motorischen Syndrome*, Springer, 1926.

² Wilson, S. A. K. *Pathological Laughing and Crying*. *Jour. Neur. & Psychopath.*, 4, 1924, 299.

so obvious is it. Bell called the seventh the 'facial nerve of respiration'; when the lower face (mouth and nose) is paralyzed it was described by him as 'paralysis of the respiratory functions of the facial.' The implication of the face in sneezing, the facial spasms occurring with respiratory 'gasps' *in extremis*, the collaboration of the facial apparatus with the other in ordinary breathing and speaking are simple instances of the action of this important synkinesis. The seventh nerve is united functionally with the tenth, and also on occasion with the eleventh and certain upper cervical spinal groups. For simplicity's sake, we may allude to it as the faciorespiratory mechanism. We note that its normal activities are involuntary, *i.e.*, it is under voluntary control only to a limited extent.

"The localization of the 'noeud' of this mechanism is still uncertain; we have to postulate a center linking the seventh nucleus in the pons with the motor nucleus of the tenth (nucleus ambiguus) in the medulla and the phrenic nuclei (see Gamble study already alluded to) in the upper cervical cord, etc. By all analogies this 'center' must be supranuclear; for the sake of argument we may suppose it has an upper pontine site.

"Our second preliminary consideration is to bear in mind the existence and function of the respiratory centers proper for ordinary automatic breathing, situated in the medulla. With normal action must also be associated coöperation on the part of the larynx and the face, otherwise normal breathing might partake of the noisy character observed in various diseased conditions.

"The most recent work on the localization of the respiratory centers is that of Lumsden, who has shown, by numerous experiments on cats, rabbits, dogs and monkeys, the somewhat elaborate nature of the arrangements. Thus, he has demonstrated that ordinary rhythmical respiration—quiet, unconscious breathing—depends on several factors. There is (a) an inspiratory mechanism at the level of the striae acousticae; this he calls the 'apneustic center' because when this group of nerve cells is cut off from above, prolonged tonic contraction of the inspiratory muscles ensues ('apneusis'). The level of the striae acousticae is upper medullary. (b) Just below this there is a separate expiratory center (medullary), the existence of which has long been suspected and is now apparently established. (c) Both (a) and (b) are controlled by a higher center in the upper half of the pons, styled by Lumsden the 'pneumotaxic' center, because it regulated normal quiet breathing. When it is cut off from (a) by appropriate section, respiration takes the form of a series of

prolonged inspirations, each followed by two or three relatively quick respirations of abnormal type. Lumsden has shown that this cycle repeats itself with great regularity. Evidently then, the pneumotaxic center produces normal respiration by inhibiting the activity of the apneustic center below (behind) it. (d) A fourth, 'gaspings' center, situated below (b) at the level of the apex of the calamus scriptorius, is regarded by Lumsden as a 'relic,' and need not further concern us. (But it does concern the postencephalic who works with 'relics,' through regression of function to lower levels.)

"Our next consideration bears on the influence of voluntary action on the respiratory center in the pontomedullary apparatus. Its automatic activity is set aside voluntarily when we deliberately hold our breath, or when we voluntarily pant, cough, yawn, sigh, take deep breaths, etc. Further, its activity is set aside involuntarily when we are convulsed with laughter, or when we give way to crying, sobbing, howling. Both in the former and the latter case facial movement is involved; we innervate the facial musculature voluntarily for the purposes specified, and the face takes its share in the involuntary expression of joy or sorrow.

"Thus we get the idea of a double control over the faciorespiratory synkinesis: (a) a voluntary control when we choose to inhibit automatic movement, and (b) an involuntary control when that automatic movement is forced to give way to the expression of emotion.

"(1) *Voluntary Control*. The path followed by volitional impulses to facial and respiratory muscles is undoubtedly the familiar corticopontine, corticobulbar, and corticospinal tract. In particular, the geniculate bundle of the pyramidal tract, from the operculum and lower end of the precentral gyrus, via the genu of the internal capsule, conveys these impulses to the appropriate nuclei. As we have seen, voluntary breathing sets aside ordinary breathing, hence we must postulate, on the principle of reciprocal innervation, a synchronous inhibition of the automatic pontobulbar center. The anatomical course taken by the latter, inhibitory, impulses is less certain, but of their reality there can be no question. It will be remembered that Hughlings Jackson explained the interesting observation he made on respiratory movement in hemiplegia by the existence of double sets of respiratory fibers passing from the brain in this way.

"Lesions, therefore, of the geniculate bundle anywhere in its course especially if they are bilateral—will impair volitional control over the musculatures concerned in the expression of emotion, with

the result that the involuntary action of the same mechanisms will tend to become abnormal. Pseudobulbar paralysis is the disease of the geniculate bundles which, we have already seen, is particularly prone to be accompanied by the phenomena of *rire et pleurer spasmodiques*.

"It is clear, then, that the more absolute the faciorespiratory paralysis, the more exaggerated is the involuntary innervation of the same mechanism. In this connection Monrad-Krohn has shown that the emotional innervation is often distinctly exaggerated on the paretic side in hemiplegia, and has proved (by the 'slow-motion' cinematographic camera) that emotional movement is actually quicker on the side showing voluntary paresis. On the other hand, for the exhibition of 'uncontrollable' laughter or tears a degree of volitional paresis or paralysis is not quite essential, though it is certainly usual; the involuntary action of a normal laugh may break down normal control; the quivering lip of the child is indicative of a balance between the action of the voluntary and the involuntary processes which may be tipped over in either direction by a trifle.

"(2) *Involuntary Control*. The careful experiments of W. G. Spencer, in 1894, determined the existence of four paths from the cerebral cortex to the respiratory mechanism. Of these, one is undoubtedly the voluntary path just mentioned, from the motor cortex via the genu of the capsule; its stimulation produces, in the ape, a sort of 'holding the breath,' or, as Spencer calls it, 'over-inspiratory tonus.' Two of the other tracts follow an entirely different course; one is an 'arresting' and the other an 'accelerating' path. The former arises from the under surface of the frontal lobe, the latter from the sensory cortex. Spencer has traced the two throughout their course; they come together towards the middle line at the mesial aspect of the lower optic thalamus, bordering on the third ventricle, and run down, near the midline of the tegmentum, to the medulla. Both are far removed from the voluntary tract for respiratory innervation in the capsule and crus. More exactly, the route followed by the arresting path is from a spot on the under surface of the frontal lobe where the olfactory tract runs into the temporo-sphenoidal lobe, along the 'olfactory limb' of the anterior commissure (where it decussates), by the side of the infundibulum, past the nucleus ruber below and external to the aqueduct in the plane of exit of the third nerve, and so to the medulla. As for acceleration, 'commencing especially from a point on the convex surface of the cortex within the sensorimotor area, the effect may be fol-

lowed back through the lenticular nucleus where it borders on the outer and ventral portion of the internal capsule; the strand runs at first externally and then ventrally to the motor portion of the internal capsule, and so reaches the tegmentum. The lines from the two sides meet in the interpeduncular grey matter at the level of and just behind the plane of the third nerves.' ”

Wilson believes it is a feasible speculation that these are the paths for emotional activation of the faciorespiratory mechanism. They are separate from the paths for voluntary control; they come towards the midline in the regio subthalamica and tegmentum; stimulation of them produces unvaryingly the phenomena of arrest and acceleration noted above. As far as the respiratory element in involuntary laughing and crying is concerned their appropriate excitation and inhibition will explain the mainly expiratory character of the former and the mainly inspiratory character of the latter.

Wilson's general conclusion may be couched in the following terms: “There are corticifugal paths to the faciorespiratory centers in the pons and medulla that are independent of the voluntary cortico-ponto-bulbar tracts to the same nuclei; on excitation they will either arrest or accelerate, *i.e.*, interfere with, the normal rhythmic activity of the respiratory center; the available evidence warrants the speculation that they are the routes taken by emotional impulses to modify the faciorespiratory synkinesis in the direction either of laughter or the reverse. Their exact course remains for further substantiation; it is perhaps noteworthy that they make their way separately towards the midline skirting the lower optic thalamus (in the case of one) and passing by the lower regio subthalamica to the tegmentum, and so to more caudal levels of the neuraxis.”

Wilson is of the opinion there is more to be said for the participation of the cortex in the production of abnormal emotional activity. “We cannot take it that the cortical origins of the arresting and accelerating respiratory tracts of Spencer are physiologically, though anatomically, separate, and we may ask—using Mills' expression—where is the rendezvous? In an ingeniously developed argument, that veteran neurologist contends that in the right hemisphere, mainly, in the midfrontal region, are centers for the representation of movements especially concerned with the expression of emotion. He gives the term ‘movement’ a broad significance, as applying both to skeletal and to visceral, vascular, and secretory activity. On the other hand, Bianchi, whose claim to speak with authority also is acknowledged, declares that ‘to maintain that the frontal lobe plays

a part in the essence and mechanism of the emotions . . . is a bold hypothesis in which there is a good deal of mere conjecture and certainly no basis of proof.'

"Be all this as it may, and however much in the matter is still obscure, our facts have led us to suggest that there are corticifugal paths for the expression of the emotions via the faciorespiratory apparatus, distinct from those for voluntary innervation of the same nuclei, and as necessary corollary we presume the existence of a cortical nodal point coördinating them. Its situation is at present indeterminate, yet it is likely to have some definite position." In this connection Wilson echoes with approval the works of Mills, who declares he is not one of those who believe that the problem of emotion, or of any other great mental process, is to be explained by regarding it in some vague way as a complex expression of the action of the cerebral cortex as a whole.

"There is clinicopathological, and experimental, evidence suggesting that nonvolitional control over the normal activity of the faciorespiratory mechanism is exercised from the cortex by routes that pass separately downwards to come together towards the midline in the regio subthalamica and tegmentum. It is not certain that these actually pass through the thalamus in man, though it is understandable that some thalamic lesions may be so placed in that ganglion as to interfere with them as a vicinity effect.

"We have no information as yet to show these paths are interrupted by a thalamic relay, nor is it known that emotional impulses can pass from sensory to motor side at this level; it is possible, perhaps, but not probable."

Inasmuch as practically every observer has called attention to the fact that under certain situations of attention (distraction) this breathing behavior is partly or entirely overcome; and under certain emotional stimuli it may be made worse; and further that in practically all cases the disordered breathing behavior ceases during sleep, it is fairly certain that bulbar implications alone do not offer a complete answer looking toward an elucidation of the syndrome under consideration.

When one reflects for a moment upon the phyletic history of the gradual integration of speech into the respiratory mechanism and when one studies ontogenetically the respiratory behavior from the initial cry of the child at birth up through its evolution into the dynamic utilization of speech symbols as expressive of its life's patterns and purposeful actions, socially expressed, it seems quite

evident that a purely medullary structural blocking is entirely inadequate to explain the situation. As Turner and Critchley have emphasized, and Wilson shown, and others also indicated, higher pathways, not only of value for respiration per se must be studied, but the respiratory syndromy must be viewed in the light of these higher socially purposeful symbolic activities.

Here it will be apparent to all students of the problems of behavior disorders in encephalitis that one enters upon an enormous terrain. The lines of inquiry spread out in every direction. They become pluri-dimensional and almost infinite.

Inasmuch as the more astute as well as the more superficial students have called attention to the "emotional" situation, the latter being satisfied with the word "hysteria," the former not satisfied with an etymological resting place but insistent upon deeper correlations between structure and function—witness Vogt's suggestions in the "Heidelberg" paper as to the subtle relations of so-called "hysteria" to striatal pathology—a certain sketchy following out of a few of these lines may not be without value.

I once observed an interesting respiratory syndrome in a pharmacist, 23 years of age. He came to the Post Graduate Hospital Clinic "barking like a dog." His bark was a dramatic performance. It had gradually developed over a period of some 2-3 years. Nothing short of a phonograph record could portray the sounds he emitted. They appeared in compulsory episodes lasting from 5 to 30 minutes.

Conceiving the possibility that what I heard at the time was a condensation product, I inquired whether if previously the sounds had been as they were at the time observed. No! they had been more elaborate the previous year but phonetically still unrecognizable. Pushing the history a step further backward a phonetic semblance to recognized vocables became recognizable and then still further back it was plain he was saying—a year earlier—half aloud and half to himself—"No I won't!—No I won't!—No I won't!" and then further back at the beginning of his difficulty the actual verbal formula was recalled. "No, I won't masturbate." Thus in the space of two and a half years—an original statement "No, I won't masturbate," became by gradual condensation the "dog-like bark" heard in the clinic. Naturally this was not all learned in an hour, nor in less than a dozen hours of careful and detailed study, not only of conscious but of unconscious material.

This observation might not seem pertinent but those interested need but read Runge's (l.c.) very carefully detailed report of an encephalitic respiratory syndromy, which he studied by the hypnotic

method, to see that Runge came to the conclusion that the respiratory behavior was a representation of what he terms a "larvated masturbation."

Personally, I believe Runge is correct, but also I think that further study would have shown it was more than that, as a psychoanalytic study of both cases here presented shows that the displaced masturbatory craving was but a part of the respiratory syndrome. The report of Case I—already indicated in the earlier pages of this study—gives some of the evidence showing that such a *displacement* of energy from the genital to the respiratory area was present and that other ontogenetic sexual stages were represented, even to well defined incest wishes. A well defined brother incest wish was evident in the unconscious of Case II. It appeared in the very first dream related as will be discussed.

Then to follow out another line not quite so well known in contemporary neurological literature, but almost a commonplace in psychoanalytic literature, the problem of "obscene language" as a *displacement* mechanism to "anal erotism" comes up for investigation.

Abraham, Ferenczi, Jones and others have analyzed the situation in full, as a contribution to character formation. Case I was exceedingly profane and obscene in the earlier months of his illness (see Burr's comments concerning "degeneracy" of this case). Scores of reports are available concerning this "obscene" language behavior in the "psychotic" reactions of the encephalitic, particularly in the "schizoid" types, where the analogies to schizophrenic obscenities are obvious. Many of the nose grimaces seen and sundry obscene words heard in Case I were loosened bits of early anal-erotic functioning pried apart from an integrated personality by the encephalitic process and through diaschisis came into pantomimic expression, passing the broken down Super Ego (censor) mechanism probably through cortical blocking from some organic substratum. In so far as recovery took place it was evident that the blocking was partial and not global and a resynthesis of the so-called "normal" personality emerged. Here we may make a concession to Hollingworth's utilization of Herbart's term "redintegration" to define a phase of the recovery process. Thus the patient could now utilize a symbol of "smearing" an enemy, in much the same sense as it would be used on the football field when the opponent's attack was "smeared"—without recourse to a less elegant form of expression.

The frequent "nose blocking" in this and other cases is in psychoanalytic terms, possibly referable to "smell" and displaced "anal eroticism."

It would be premature to attempt to postulate here the numerous structural problems which I have thus briefly summarized in other terms. Every student of neurology knows that the original striatum was of olfactory origin. Here, as Kappers and others have pointed out, was the nucleus of the paleoencephalon, which played so marked a rôle in the behavior of the animal phylum before the distance receptors began to accumulate their end stations in the gradually evolving neo-encephalon. How (diaschisis) dissolution of function can reactivate these old mechanisms and thus bring these nose behaviorisms into prominence I shall not attempt to formulate, the problems are too intricate. I shall only state that they are there awaiting analysis in the nasal tics, olfactory hallucinations, food phobias, schizoid oral activities, and possibly some epileptiform associated reactions.

In a communication made before the Research Association of Nervous and Mental Disease in December, 1925, I have discussed at length certain aspects of the similarities and differences between the psychotic manifestations of "post encephalitic" and "schizophrenic" behavior and there called attention more specifically to olfactorally determined bits of conduct along lines paralleled by Sullivan and others who have investigated the "oral erotic" behavior of schizophrenics.¹ My Case II, with her persistent finger sucking difficulties (lime drops, cigarette smoking, fish mouth lip appositions, etc.), offer material of a less complicated character as data for such investigations. These nasal-oral combinations are primitively associated phyletically, and hence ontogenetically. One need not go into the steadily advancing mass of animal behavior data to show how important these early biological conditionings are. All that can be done at this time is to note their significance as immense fields for study as the monographs of von Kries, Parker, Henning and others indicate. Thus nasal-oral behavior cannot be entirely overlooked since they form such an important part in "respiratory" behavior, seen from the standpoint already brought into the field by Wilson's study, quoting Bell anent the "facial" nerves as an efferent factor in respiratory activity.

Furthermore, whereas this study does not concern itself with the

¹To be published in *Am. Jl. Psychiatry*, 1927.

polyuria so frequently observed in the larger group of the encephalitic syndromy a few cases of a "whistling," "hissing" respiratory type of so-called "tic" might be put on record. These were plainly traceable, psychoanalytically, to the urethral-erotic type of diaschitic phenomena. One patient very clearly showed that "whistling" and the wish to urinate were correlated. There was a distinct proportion which could be stated "the more he whistled the less he urinated and the less he could whistle the more the urge to urinate" (running water). Cases of Wimmer and Gabrielle Lévy have already been cited in this connection.

(5, 6, 7.) Thus we are led to the consideration of (5) the broader mechanisms of the emotional releases through the speech mechanism, (6) of the highly complex relationships of visceral component involvements in the encephalitic syndromy and their behavior manifestations, which opens up the enormous territory so actively under investigation by students of the problem of the psyche and the vegetative nervous system (extrapyramidal regions), to mention only Küppers, Hess, Lotmar, and finally (7) of the metapsychological problems investigated by Freud and his school in the formulations of the Super Ego, the Ego and the Id.

It would be presumptuous on my part to claim that the present discussion approached any final statement of these situations. All that I hope to accomplish here will be to offer a glimpse at certain features which are believed to be of service in the accumulation of data looking forward to a better understanding of the subtle, intricate and highly condensed mosaic that make up human behavior, especially as revealed in the disordered state specifically under investigation.

PART IV

PSYCHOPATHOLOGICAL PROBLEMS

When one seriously gives himself to the reflection that the human organism, as an energy system, has been a billion years in the making, no one but a consummate ass could believe himself capable of understanding but the most insignificant part of this whole magnificent evolutionary product. One can quite sympathize with Fabre, that brilliant genius who has done so much in the study of insects, who has said that he had turned over only a grain of sand upon the beach of the insect world and hence did not pretend to comprehend the whole ocean. Whereas, perhaps, it would smack of an excessive affectation to be so humble with reference to our own communication, nevertheless we know that the material here offered is but a grain of sand in the whole structure. Or to change the metaphor, "since our knowledge is no more than a scratch upon the solid mass of our ignorance, we cannot profitably dispense with any instrument or kind of method."¹

As one notes the behavior of these patients with respiratory anomalies; reads the reports of others concerning the same; endeavors to include other features of apparently important significance in the general picture; and would boil down or concentrate the entire situation, and rashly make an effort to generalize, at least two avenues of approach seem to offer some help to one of the goals of all such enterprises, *i.e.*, the goal of therapy.

Given two such patients, as already outlined in our paradigmata, how is one as a practicing physician, to proceed to bring about an amelioration of the situation, the which is the only question, which concerns the patient, and his entourage? From what vantage point is the desired result to be brought about? Since good theory lies at the basis, fundamentally, of good practice, which avenue of approach seems to offer the most? Our own reflections lead us to believe that looking backwards from the highest vantage ground of the latest evolutionary products is more likely to offer one the opportunity to see the whole situation, rather than looking forward from the begin-

¹ Donley, J. E. What Young Physicians May Learn from Hughlings Jackson. Rhode Island Med. Jl., Nov., 1924.

nings of things towards the final summation, realizing that both issues have a common meeting point. Hence in our searching for a resolution of points (5, 6, 7) we choose to pitch upon those conceptions which deal with ascertainable data concerning the *purpose* reached for by the *behavior* in question. It is fully realized that such a search for *purpose*, behind the behavior is not by any means any less difficult to summarize, than the means, or structural-functional (anatomical-physiological) correlates. Yet this, for the time being, is postulated as desirable.

Inasmuch as *function*, phyletically speaking, has gradually built up *structure*, we turn our attention to those fundamental mnemonic precipitates which biology has termed the *instincts*, as automatically working *purposes*. Of these, disregarding the later evolving *habits*, termed "instincts" (we think incorrectly) by some serious students of these problems, what light can be shed upon our problem by a study of those instinctive reactions which practically all biological students have agreed are fundamental in all life processes, *i.e.*, *Reproduction* and *Subsistence*, *i.e.*, the Sexual and the Self-Preservation Instincts. Without the former evolution is unthinkable. The latter is a correlate and in a sense a dependent. Thus one turns to conceptions of comparatively recent formulation concerning man's mental systems in an effort to learn somewhat of *purpose*. By "purpose" we are not here speaking of what emerges in conscious processes only; we mean by it patterns elaborated for the attainment of definite goals. In a sense here "purpose" is thought of as something similar to the conceptions of entelechy, not the least interesting of which are those of Driesch. The older psychological schemes cannot be dismissed summarily, as for instance is attempted by the Behaviorist, or by that movement in psychology known as Phenomenalism, nor even by the Gestalt or Configural psychology, important as some of its conceptions undoubtedly are and promise even more to be. In the broad sense a *genetic psychology* appeals. It may be claimed as a viewpoint by all of those here cited. Inasmuch as the Freudian psychology, speaking in the large, alone³ has really come to grips with "pathological" behavior, its principles make a special appeal in studying the material under consideration. In

³ We are not unmindful of Gelb and Goldstein's studies by means of the Gestalt conceptions, but as yet this field has been cultivated but slightly in pathology. *Psychologische Analysen hirnpathologische Fälle*. *Psycholog. Forschung.*, 6, 1924, Heft. 1, 2.

another place⁴ I have discussed specifically Hauptmann's⁵ contribution to this problem, especially as it applies to the behavior of the encephalitic, particularly directed to the loss of, or lack of initiative seen in so many of these patients, including those showing regression to the "respiratory level," in other words, those here discussed.

It is difficult to decide just where to break ground in discussing this respiratory behavior from the psychopathological point of view. The field is practically a virgin one. In stating this one is not unmindful of the fact that a vast and important series of studies is available concerning anomalous respiratory behavior. We leave to one side that part of the field in which lung, heart, kidney, thyroid pathology is of moment⁶ and deal with respiratory disturbances of manifest neuropsychiatric importance. In the special field which has been separated, the rubric of "hysteria" looms large in nosology. Weir Mitchell's study has been cited as an indication of this material of an earlier vintage. How to put it in new bottles is a part of our problem. In fact even those collections of rare vintages had their earlier cultures to which a study of Garrison's charming "History" offers orientation. To avoid, however, a historical series of reminiscences which might even include Laehr's classical collection, it seems more desirable for practical purposes to wave them all aside and come to the present era of formulation instead of laboriously weaving in and out of the historical perspective.

In Freud's far reaching conceptions, embodied chiefly in his study of "Das Ich und das Es," if here comprehended arightly, the *mental systems* of the adult human being may be conceived of as roughly partitioned into (1) a fundamental group of mnemic accumulations,⁷ the "Id" as he would call it, which functions as a whole, for the phyletic instinctive urges of race continuation and personal subsistence. Life wishes, or purposes, or patterns, are here automatically represented. Death wishes, or purposes, or patterns, are also there present.⁸ (2) A second mental system has evolved, a Das Ich—an "Ego" which is less automatic, less of a reflex automatism, hence more plastic in its functioning, and more in contact with conscious-

⁴ Jelliffe, S. E. Schizophrenia and Epidemic Encephalitis. Their Alliances, Differences and a Point of View: Research Association of Nervous and Mental Disease. Dec., 1925. Awaiting publication, Am. Jl. Psychiatry, Jan., 1927.

⁵ Hauptmann, A. Der "Mangel an Antrieb" von innen gesehen. Arch. f. Psych., 66, 1922, 615.

⁶ See Hoover, C. F. Bedside Study of Air Hunger. J. A. M. A., 87, 1926, 813, for recent general orientation in this somatic field.

⁷ We here follow Semon's general conceptions.

⁸ Available in English. The Ego and the It. Hogarth Press, London, 1926.

ness and immediate reality from without than the older unconscious mnemonic bindings of the Id. From the genetic point of view both of these mental systems are directed for the most part towards reality. That part, the Id, at least has had a billion years experience with reality and knows how to handle it automatically, and if not prevented, advantageously. This is the "Wisdom of the Body."

The human organism must handle reality *stimuli* from *without*, as well as *instinct* stimuli from *within*. It must master both. It must either *adapt* itself to the outer stimuli or *abolish* them by some procedure. In the former case the psychophysiological system must make an *autoplastic* type of adaptation (modify itself) or it may be by an *alloplastic* procedure (modify the stimulus), abolish the particular source of stimulus from reality. In the case of mastering instincts, the same procedures or mechanisms operate in health as well as in disease, at biological as well as at social levels. Thus when an animal develops hair to meet the cold stimulus of winter, an *autoplastic* mechanism is at work at a biological level. If at a social level the human being puts a furnace in his house to meet the same cold stimulus, he operates *alloplastically*.

As has been pointed out by Freud and others this alloplastic mode of behavior is chiefly a social attainment; biologically the autoplastic processes are more in evidence. Thus in the mastery of the sexual instinct stimuli from within (whether hormonal, reflex or symbolic) the immature personality has recourse to autoerotic autoplastic gratifications; the adult mature personality seeks external objects—biologically heterosexual, and socially, exogamous and marital. On the side of subsistence, biological autoplastic processes have developed limbs, teeth and alimentary organs; socially, weapons, agriculture, cooking, refrigerators and tinned foods have been developed alloplastically. As Alexander⁸ has well expressed it "the reproductive instinct has in part, in association with the self-preservation instinct, adopted this autoplastic moulding of the body apparatus, together with alloplastic modifications through civilization, by creating new objects." The *libido component* can be found in every product of civilization as in every part of the bodily apparatus. The point of chief interest is to preserve a tension equilibrium in the mastery of external stimuli and of internal instinct stimuli. This the mental systems accomplish through these alloplastic and autoplastic pro-

⁸ Alexander, F. A Metapsychological Description of the Process of Cure. Int. J. Psa., 6, 1925, 13, a translation from Int. Zeit. f. Psa., 11, 1925, No. 1.

cedures, either modifying reality to suit its own purposes or unable to withstand the pressure of reality, it adapts by altering itself. Reality comes from without and from within.

It will be shown, inasmuch as disease processes in general, and in particular the one with which this thesis is concerned, brings about in large measure regression or dissolution of function to earlier stages of organization, that the ontogenesis of the libido situation is of paramount importance if the behavior of these encephalitic cases is to be partly understood and specially the respiratory behavior. Thus in the developmental stages of the libido organization there comes about a replacement of an intrapsychical narcissistic object by extrapsychical objects. An autoerotic libido discharge takes place by genital activities towards objects. In a neurosis, considered as such, there is a protest against the culturally arrived at alloplastic stages of development. Thus neurotic behavior, as a fragment of the respiratory picture in the focus of attention may advantageously be seen in a similar light. A neurotic symptom may be envisaged as an unsuccessful effort at adaptation as Freud has emphasized, and, in the frame here constructed, an attempt at "autoplastic mastery of instinct." Just how this works out in the respiratory phenomena we shall hope to suggest.

But one is not finished with the theoretical considerations. When the mastery of instinct stimuli is only partly successful, the tension is not entirely relieved. The deepest layers of the personality—the Id—may be somewhat freed, its entelechy partly expressed, but a later system, the Ego, must take up the task. Here the "feeling of illness" in consciousness is a register of this transfer of tension. Again to lean on Alexander's phrasing of the situation, "the conscious ego has already reached the mature stage of exogamous, genital object-libido; it has prepared itself for activities towards sublimated patterns; the symptom on the other hand consists in an autoplastic modification, in a substitution of incestuous, introjected objects for exogamous objects, and, in the psychoneuroses, considered as such, only in *hysteria* is a genital form, substituted for a *pregenital* form.

These *pregenital substitutions* are of especial importance in our inquiry and will occupy our attention later. It may only be emphasized at this point, how totally inadequate and misleading—if not nonsensical—in certain cases, have been the conceptions that would speak of the various forms of encephalitic behavior as "hysterical,"

“pithiatic,” “hysteriform,” etc. Such belong to the baby language of science relative to the psychoneuroses.

To resume the theory; the attempted autoplasmic substitutions which by regression would try to master the instinctive pattern (entelechy) discharges gives rise to the *feeling of illness* as a repudiation of the actual symptom formation. To anticipate, in practice, the obscene language in our Case I when under Dr. Burr's care, and nosologically classified by him as “degeneracy,” is conceivable as an autoplasmic regressive phenomenon, in which oral-erotism and anal-erotism would take the place of (*i.e.*, be substituted for) genital interests. To anyone at all acquainted with ancient customs as recorded in the story of Lot, and Sodom and Gomorrha, or as later chronicled by Petronius in his *Satyricon*, the socially evolving aversions to such displacements of genital interests, can be envisaged in a new light. The *actual symptom*, “sodomistic behavior,” is repudiated by our patient. The outlet for his regressively felt anal-tension consisted in “obscene language” oral behavior.

In order that “such things may not be,” for even the sickest patients prefer an absolute flight from reality even into a psychosis, the fight between the ego and the id—as the two mental systems may be envisaged—goes on.

In the earlier formulations of psychoanalysis one reads much of frustration, of disappointment, and of trauma. Certainly in encephalitis, one finds a trauma much greater than that conceived of by Freud in the early days of his investigations. Here is a trauma almost the equivalent of that of paresis, which has been most suggestively studied by Hollós and Ferenczi.⁹ This trauma of encephalitis goes much further than most “traumatic neuroses” producing traumata—but does it change the mechanisms? Practically all the neuroses may be interpreted from a traumatic basis, in so far as trauma, in its largest sense, means encounter with reality, and what is termed *constitution* may be conceived of as but another term for *phyletic experience*, whereas *disposition* may be envisaged as *ontogenetic experience*, of trauma (stimulus) reality.

With “constitution,” as thus conceived, here there is no concern. It is left for the students of heredity problems and interests us chiefly in prognosis. With “disposition” there is much concern, especially since imitation plays such a large rôle in the matter of determining

⁹ Hollós and Ferenczi. *Psychoanalysis and the Psychic Disorder of Paresis*. Monograph Series, No. 42.

just what environmental patterns the individual has had in his mastery of reality, from without as well as from within. Very frequently one has but to carefully watch parents to understand why the patients are fixated in certain reactions. As a result of the trauma, regression takes place, and attempts to stop at certain fixation points in the individual development are more or less successful. Freud's principle of the "repetition compulsion" here becomes illuminated, for the patients repeat "movements" muscular, visceral, lingual, etc., which are of autoplasmic service, at a given fixation point, for relief of the tension of their instinctive cravings. The "repetition compulsion" is the result of a tendency to discharge either in the mastery of the external stimulus or of the instinctive drive. In the former case some motor activity calculated to modify the stimulus, or change the body itself results. Reflex innervations, automatically operate in the first case for standard stimuli. Any mechanism therefore which has been of service in the past may be seized upon like a compulsion—an echolalia, palilalia, siallorrhea, diarrhea. Possibly even the paroxysmal tachypnea of the respiratory cases contain as an element a release at an early level. Whether to external or internal stimuli, or both, only individual study can show which effort at mastery preponderates in the repetitive act. In so far as histopathological study has shown that great trauma is inflicted upon the vegetative mechanisms of the thalamic and striatal levels, it is not unreasonable to argue that the task of mastering instinct stimuli is greatly interfered with and that the relief activities found should show repetition features at earlier, *i.e.*, phyletically (decerebrate, bulbar, spinal, even peripheral sympathetic), levels of functioning.

The various stages of organization of these instinct activities are very incompletely worked out for the nutritive or metabolic activities. As already indicated the work of Dresel, Lewy, Laignel-Lavastine, Pende, L. R. Müller and others supply a great fund of information concerning various stages of metabolic organization activities. It is not feasible to enter into a long discussion of transformation stages of chemical organization. Hence we jump at once to the oxidative hormone function as one of the earliest fixation periods where, to paraphrase Descartes, "Cogito ergo sum," one might say "I breathe ergo I survive." Instinct mastery of the self-preservation principle consisted in this organized reflex activity. "Back to the lungs" could be the cry of the organism threatened with extinction in a

topsy turvy vegetative nervous system trauma¹⁰—not overwhelming enough to cause death, but sufficient to disorganize the orderly schedule or pattern of automatic metabolic adaptation. As stated, from the standpoint of the mental systems formulation, the Id pays attention to these phyletic mnemonic patterns, and said formulation constitutes the *mental aspect of the precipitate of these instinctive situations*. As one, at one time somewhat immersed in biochemical problems, no more fascinating research can be imagined than to enter into the study of the stages in organization of metabolic complexity. Possibly such a conception is an illusion of the systematizing “personality type.” As mankind lives by his illusions, at least so great a genius as Ibsen has claimed it, let it rest at that.

At all events certain investigators have shown that the “fiction” (Vaihinger) of “organization” in the field of the genesic instinct has yielded important conceptions for understanding human behavior and principally the psychoanalytic tool of investigation from the standpoint of regression and fixation, elucidates many a bit of behavior incomprehensible from any other point of view. These stages of organization are too well documented to need any extensive recital here. Every step in the process is still under investigation, but certain broad platforms emerge. These are: the intrauterine phase (broadly surveyed in Rank’s “Trauma of Birth”), the various autoerotic (organerotic)—polymorphous perverse phases, pregenital and genital, chiefly outlined by Freud in his Three Contributions, the Œdipus phase of Freud, the genital supremacy phases, finally culminating in the socially matured development of a *heterosexual, exogamous, sublimated family phase*, ideally phrased as civilized, cultured, socialized, with its millions of patterns of discharge for creative tension.

If by reason of frustration, disappointment or trauma, or other cause or causes, the individual is unable to discharge his energy at the highest social levels, according to the conception of regression in psychoanalysis, or of dissolution of function in Hughlings Jackson’s terminology, he falls back upon early stages of fixations and by autoplasmic or alloplasmic modifications attempts an adjustment. The libido, using this concept, utilizes what it can. The resulting behavior is complex but challenges interpretation.

¹⁰ See Pierre Marie’s interesting comparison to schrapnel-like trauma of the encephalitic virus in his Introduction of Gabrielle Lévy’s thesis (l.c.).

Inasmuch as no effort is here even thought of to attempt to envisage the entire symptomatology, but only to try to scratch the surface of our ignorance of the respiratory behavior, attention may be directed to obtained data practically as yet in a virgin field. After presenting some of this material gathered by the analytic method of study, a return to the theoretical situation is contemplated.

Much as one would like to line up the data, with the theoretical postulates here briefly sketched, this is impossible. The collector of fossils does not find them all carefully arranged as in the museum, any more than the botanist finds his plants on the hillside classified according to the manuals of Engler and Prantl, Bentham and Hooker, of Gray, or Britton and Brown, etc. He gathers what he finds and arranges them in their natural order as best he may later.

Thus for the data in psychopathology attention is first directed to Case I here cited in detail as to the clinical history and phenomenology.

Case I was brought for treatment by a most alert, intelligent, and hopeful brother. This is emphasized because without this brother's most persistent and conscientious efforts the results obtained in therapy might have been nil. The brother had been a reporter on one of the New York dailies which in a sense had made him "acquainted with human beings"; he was no academically trained psychologist.

During the first week of our contact—three interviews—attention was directed to the patient's story and to a neurological examination. His dreams were requested but they were not discussed. It need not be unduly emphasized here the rôle that dream-analysis plays in the general psychoanalytic situation. Nor are we interested, at this point, with the criticisms directed towards the possible fallacies of the method.

The first dream which seemed to offer a profitable opening for the analysis was as follows:

OCTOBER 29, 1924.

Last nite I dreamt I played hookey at C. High School. I had two difficult written lesson to hand in that day. I had them done partly (not efficiently). I did not like to go to school with my work done in a half-assed manner. I was in a candy store about two squares from the school. Incidentally I had already gone to school, hung my winter overcoat and felt hat in my locker at school. At the candy store I met a very dear pal o' mine—J. L. I told him I wanted to

"bag." He replied, "I can take the day off without playing hookey, why don't you do the same?" I told I would but I was afraid I'd get hell from my folks. I also dreamt that I sent J. to school for my coat and hat. I told him to put the coat over his spring coat and bring it to the candy store and we would go to Philadelphia.

No detailed analysis was made of this first dream, although the pleasure-serving nature of the illness was apparent. Its even superficial survey reveals some regressive factors which are of value in view of the theoretical outlines here given.

The discussion regarding *playing hookey* brought up his not infrequent practice of playing hookey from school, loafing in court rooms, and certain curiosities regarding criminal acts. It also led to a discussion of his compulsion to stay in bed in the morning, or all day, and the fights with his father and brother to get him out of bed. The technic of the male members of the family in handling this staying in bed, a very constant symptom in this type of case, was the usual one of hectoring and badgering. It was the "spare the rod and spoil the child" kind of firmness. This had been the routine when he was on the "farm" under "treatment" and many of his most violent, almost katatonic, tantrums had come from the negativistic refusals to get up when the "nurse" would pull the covers off his bed and even throw cold water on him. All of this type of thing was of no avail. I had to tell the father in decided terms to "leave the boy alone." "Treat him as if he did not exist and the results would be better." At first the father could not occasionally resist the temptation to use forceful methods, but so pronounced was the opposition and stubborn behavior on the part of the patient each time he attempted it that he soon saw it was a destructive rather than a constructive method and he left the boy much to himself. This regression to a sadistic anal-erotic "obstinacy" characterized both Case I and Case II. It was extremely marked in Case II, who for a year or more rarely would get out of bed before the afternoon or just before the dinner hour. Also see Parker's comment *re* "stern discipline."

In Case II where for a period of nearly three months I had opportunity to note daily this "staying in bed" symptom, all I could learn, from the conscious side, was that she was so "tired" she could not get up. Here the "lack of impulse," "Mangel an Antrieb," much discussed by Schilder and Hauptmann, was rationalized as "she was so tired" as she had been awake all night with heavy breathing. This so-called lack of impulse is but a surface indication

and, as in the compulsive neurotic, there is an *increase* of impulse in the direction towards the death wish but held under repression, hence unexpressed, save through some ceremonial, *i.e.*, symptom.

Further discussion of the dream in Case I brought out the difficulties he had had at school after his delirium and after the summer vacation when he tried to go back to school. Further dream analyses were quite definite in establishing a "transference." The details are omitted here since they deal with the general situations of psychoanalytic technic which have no particular relevancy in this communication.

Attention may be called to a very interesting dream of January 7, 1925, in which the Oedipus situation was brought up.

"I was with another fellow—he lives here in New York (my old friend Jerry). First he said let's go to a \$1.00 house. No, I said let's go to a cheaper one, a 50 ct. one. So we went. At the door there was a peculiar device to open the turnstile type of door; a device like a dial telephone disc, yet it was vase shape in general proportions. We turned it, a bell rang and then we entered by a side entrance. The madame of the house was my aunt, and there were two girls in their undergarments, two beds. Jerry was all there as he took the lefthand girl. It took him some minutes and he puffed and grunted and everything (just like I do). I did not do anything. We paid our 50 cents and got out."

For anyone who has had but slight analytic experience, *i.e.*, one who has not read about it only in books, but has actually tried to analyze a patient, this dream scarcely needs any extended discussion. Its main features are quite explicit. First one sees the splitting of the patient into *himself* and *Jerry* which is a frequent dream device indicating different aspects of adaptation to reality (here inner, instinctive [libido] drive). Previous analyses, as well as association material with this dream, reveals "Jerry" as his inferior, *i.e.*, regressive immature, infantile and adolescent (narcissistic introjection) split off, sexuality. It was by Jerry that, from 12 to 13 years of age, he was first initiated into the pleasures of mutual masturbation. Jerry also had in these early experiences made sodomistic advances and encouragement (pregenital anal-erotic organization stage). The patient states these did not interest him consciously but efforts at seduction of little girls through Jerry's leadership was much in evidence after twelve. The \$1.00 and the \$.50 detail are, I take it, as expressing both the (1) adolescent and (5) finger (handling, feel-

ing the genitals) method of seeking the female. Jerry, as more proficient in the art of seduction, is the sponsor for the former, *i.e.*, \$1.00, the 100 per cent (coitus) pleasures.

The "door" device could not be analyzed further, indicating juvenile efforts at phallic and finger seduction. The "madam" of the house was his aunt, the *mother's sister*. She resembles the mother very closely and the identification is evident and throws light upon the Œdipus phase.

The significance of the psychological motivation of the "breathing attack" is quite clear as to some of its components. It is a forbidden activity carried out in a substitute, i.e., a regression to an autoplasmic mechanism, a fixated mechanism at the respiratory level.

Asked why in the dream he himself did not go through with it, he said, "Jerry took the prettiest girl. I did not like the other girl's looks."

Q. What was wrong? A. "Oh, I don't know—I guess I was sore he took the pretty one."

Q. Yes. A. "The other one had bandy legs."

Q. And. A. "They reminded me of someone—I don't know—oh, yes, my uncle has legs just like that! He's my father's brother. Oh—that's funny! Is that father? What does that mean?"

It is possible therefore that the *father prohibition* entered into the inhibition in the dream. The male aspect of the Œdipus situation.

It may not be too hazardous also to state here that a part of the psychodynamics of the salivation represents what it is known to represent in many schizophrenics, *i.e.*, an orgasm. "Jerry had an orgasm in the dream." The patient only envied him, *i.e.*, "his mouth watered." It may be mentioned that when the patient is in a trance state "his mouth waters," *i.e.*, he salivates. Salivation in trance states, chiefly apneic periods, was frequent in Case II as well.

A more detailed study of the mouth movements may be entered into later, where it is clear that oral-eroticism as a regressive stage to the nursing period, is another factor in the salivation behavior. In Case II this is certainly evident wherein finger-sucking still persists at the age of twenty-seven.

Dream of January 16, 1925, Case I: *Horrible Dream: Dog was biting my damned hand. He was panting like the devil. I could not shake him off—(left hand).*

It has already been indicated that in Case I panting frequently terminates in a trance state with salivation, and cyanosis, as well as a secondary set of phenomena due to the pulmonary hyperventilation,

i.e., tetaniform cramp states. The trance states may or may not be so synthesized, for the patient frequently had trance states independent of the hyperventilation phenomena. Apnea was almost always concomitant with the trance states, also at times the breathing halted, or was micropneic, and trance states supervened. It seems, therefore, reasonable to recognize trance states independent of the hyperventilation biochemical consequences—acidosis, etc., and trance states even independent of breathing anomalies.

In the "Jerry dream" as well as in this dream of January 16 the "panting" breathing was recognized readily by the patient as of the type which was frequent with him. In the "Jerry dream" it was Jerry that "panted." In this dream of January 16, the patient himself panted. The coitus equivalent has been indicated in the "Jerry dream" and psychoanalytically it is not difficult to glimpse the Oedipus situation. The "madam" of the house is but a thin disguise for the mother. The inhibition or censorship that prevented his own participation, *i.e.*, consciously recognizable as himself as performing the coitus, can well be conceived to be the father prohibition, more ingeniously disguised behind the "bandy legs." Whereas it may be difficult, even seem absurd, for the scholastic Aristotelian to make this identification, one is not interested here in the conscious logic taught in colleges; even though it may be shown that in algebra such substitutions are not objected to, for x may have any value that solves the problem. Thus the girl's legs as x , =bandy legs = Father = prohibition, is quite consistent with dream logic as with algebra.

In the analysis of Case I it was never possible to revive any memory of actual observation of panting during coitus on the part of the parents. The opportunities were not lacking however as the general history had revealed. This situation however has been amply covered in the general literature.

In the dream of January 16, the "panting" was evidently of a different stage of behavioristic reaction. It was more in relation to the masturbatory complex. All the setting is there, the regressive libido (dog), the offending member (hand), the threat (probably castration) (biting). Needless to say the patient's whole conception, in consciousness, of the act of masturbation came under discussion. It was the usual one of fear of "ruining his life"—compulsion to perform, remorse and regret, etc. It is not necessary to detail the therapeutic elucidation of the significance of masturbation in

the genital organization. All that is necessary here to point out is the participation, as a substitute reaction of the masturbatory act in the breathing episode.

As already noted Runge came to a similar interpretation in his patient, although, and this is possibly worth emphasizing, his conclusion was reached by the hypnotic rather than the psychoanalytic technic. Furthermore we might venture here to show, were it important enough, that Runge's patient's breathing also incorporated higher genital organization phases as well.

Following the analysis of this dream of January 16, Case I was able, he said, to read a book of 300 pages. This was the first time since his illness he had been able to concentrate long enough to go through a book.

Following the botany metaphor of collecting our specimens as we find them, independent of their systematic alliances, a later dream may be cited. It is of interest from a number of points of view. From the standpoint of the dynamics of resistance it offers interesting material bearing upon theory, since "resistance," "fixation" at earlier psychosexual organization stages, and the "repetition compulsion" as a discharge mechanism, are all bracketed in the same frame; and secondly—although somewhat outside the main thesis, *i.e.*, the "breathing repetition compulsion," it may throw light upon a bit of muscle behavior which is one of the most frequent of the phenomena of Parkinsonism—*i.e.*, the "tremor."

March 10, 1925. *I dreamt Jerry and I were waiting for a train. A cop bumped into Jerry. Jerry hit the cop. The officer grabs Jerry. I stick up for Jerry. The cop (a great big blonde six-footer) grabs me too—by the collar. I cry like a baby. Jerry cries too. He walks us for a while and then takes us into an old shack. In the shack is an old dirty room. In the room next to it is a young Italian woman. (While the cop is holding me and taking me to the "shack, I am threatening him.") Meanwhile the cop goes to make a phone call in the shack. When he goes I say to Jerry, "Let's beat it." Jerry hesitates for a moment, then agrees. We run into the yard and hide behind a snow bank. At this stage of the dream I wake up.*

I am the "cop" (American jargon for policeman—gendarme). (I am 5 ft., 10 in. in height, blonde, and weigh nearly 200 pounds, *i.e.*, "a great big blonde six-footer.") "Jerry" here again functions as the split off, lower stage of libidinous fixation. Here is a conflict, as in the case of the choice of girls in the brothel in an earlier dream.

The transference-resistance phase is clearly indicated. The analyst is a little too strong for him—protestingly both are carried back into an earlier phase of the libido situation—the Italian phase—lower phase. *Young Italian woman* (by association, refers to coveted illicit amorous adventures; Jerry knew a “dandy dago girl” who was quite ready for the asking).

Here one sees the effort to shake off the father (prohibition), the “cop” and to “beat it,” *i.e.*, to regress to the phantasy of illicit amorousness. Behind the “*snow bank*,” behind the “mother.” In order to get away from father, the child hides behind the mother. In regression retreats to the mother.

These are some of the general outlying features of the dream but the situation to which attention is now specifically directed comes out when one scans the dream *as it was written out* by the patient, and here reproduced. Particular attention is called to the line in the written copy of the dream where the patient (regressive libido situation) in custody of the prohibiting father, *i.e.*, the Super-Ego censorship (*while the cop is holding me and taking me to the shack, I AM THREATENING HIM*) here the parkinsonian *tremor* appears most strikingly. Thus (see next page):

It might seem that this *tremor* situation were dragged in, but as it regularly appears in nearly every respiratory case which I have observed, it seems to bear a close relationship to the whole “purposeful” (unconscious) substitutive regressive autoplasmic indulgence of the patients’ libidinal discharge, and in the nature of some *fear* lest they be detected in this maneuver. No one needs to be reminded of the close relationship between fear and tremor. Animals and man have “shaken like an aspen leaf” ever since human records of fear states have been made. The various layers of this reaction will probably be analyzed with profit for centuries to come. One need but cite Stanley Hall’s “Synthetic Genetic Study of Fear.”¹¹ Here our interest is limited more closely to a level indicative of the conflict of the individual in his regressive indulgence of some phase of his genital organization less culturally permissible than the Ego-ideal registers; or maybe one that biologically is inimical to his creative goal, or, even at the level of the Id—something possibly destructive to his life (death wish-suicide component). Were we slavish followers of Stekel’s conception—the “snow bank” might be significant of the “death wish.” Again the “snow bank” is known to symbolize

¹¹ Am. J. Psychology. Also see Freud: Hemmung, Angst und Symptom. Vienna, 1926.

the mother's breasts, and here again a component of "salivation" appears.

In the delirium at the onset of the encephalitis in Case I it may be recalled that the patient saw "angels." It was possible to reconstruct a part of this delirious-regression image, but only a fragment. These "angels" were dimly reminiscent of something connected with his childhood—beyond this, any recall of infantile memories was unattainable. Psychoanalytic workers know many reasons why. It

Monday Morning Dreamt Last Nite

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to it is a young Italian
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[Brackets ours.]

was learned, however, through the brother's inquiries, that these "angels" were replicas of wood bas-reliefs on the back of a sofa upon which the mother of the patient frequently sat when she nursed him, and this, quite into his second year. It has disappeared from the family's possession since the patient was four to five years of age. At this point it will be recalled also that Case II was a persistent nurser, and further a "finger sucker" up to the present time (twenty-seven years). That her "drooling" should be a prominent symptom seems not illogical as a persistent autoplasmic regression to oral-erotic gratification discharge.

The Apneic Phase: Consideration of the end to be attained in the respiratory cycle would be incomplete without some attempt at an understanding of this phase of the phenomena in question. Although but few of the studies already given in abstract indicate that a regular

respiratory cycle is the rule, personal observations of many cases seen cursorily, and careful observation over many months in the two here reported, are clearly indicative that the respiratory behavior can go through a fairly regular cycle. It begins, mounts, continues for varying periods, and finally ends in an apneic phase with trance states, or yawnings or cyanosis or other type of climax. In short the behavior, respiratorially expressed, seeks some end—a tension discharge of some sort. To say that the patient is “fatigued” is not at all an adequate summation of the situation.

In Case I this whole cycle was very definite. It was a series of clear-cut cameos. In Case II it was less so. The pneumographic tracings show this. Disregarding the vastly more numerous incomplete cycles, a typical cycle ended invariably in a state of partially obscured consciousness. These have been described in many instances by many observers as trance states, unconsciousness, epileptiform, narcolepsy, etc., etc. The feature to be emphasized is the *climax to be reached*, whether in yawning, mouth grimaces, tics, shivers, mild convulsive attacks, trances, or what not. In practically all of the reported cases, sufficiently detailed to be of service in this portrayal, salivation, with cyanosis with or without antecedent facial suffusion is discernible. Expressed in conscious terms of purpose, the patient is after something, and gets it—completely or incompletely. As already stated for Case II, the deeper the “yawn,” the greater the release of tension, and the greater free interval before the new necessity to meet the stimuli from without or those from within by a repetition of the breathing behavior. The “yawn” at the sensorimotor or physico-chemical levels is not our concern at this moment. We know quite well that yawning and stretching have oxidative functions and that sleep is not a negative of being awake and a passive state, but is a purposefully sought active process for anabolic requirements, as well as relief from meeting stimuli from without and turning on an old method of handling stimuli from within (dream work).

In other words the greater number of these attacks carefully studied showed “compulsion activity.” The data are not available in the many reports here abstracted to permit or to contradict such a generalization as invariable.

The conception is here put forth that such compulsive reaching for a stage of adjustment, and its resultant tension relief, may be said to be accomplished at many levels of psychosexual organization. As

already indicated, from dream evidence, see Case I, already cited, a respiratory cycle may, like a major hysterical crisis, accomplish a coitus substitutive relief. Case II showed similar relief situations as will be reported.

These were discharges of tension at levels of genital organization, nearly always involving, however, taboo components in the Œdipus sense. The whole thing had to be camouflaged because the object was not intrinsically exogamous and hence socially permissible. Father or mother as Case II and Case I respectively show.

In the majority of attacks, however, the phase attained was narcissistic, *i.e.*, masturbatory in the general sense, often with homosexual factors. Case II showed the homosexual regressive fixation stages very persistently in the dream material, although entirely foreign to consciousness. Here, however, a pronounced unconscious brother-fixation was the index of the homosexual (narcissistic identification) situation.

The observations here specified are not isolated ones as may be seen from the very few facts offered by Witzel relative to his Cases II, III, IV. Thus in Case II, the free association technic (dreams are not recorded by Witzel) brought out the facts of early exhibitionistic traumata and attempted genital manipulation by older boys when the patient was eleven years old. A cousin of hers in masturbatory activity with her had dyspnea like the patient's and this cousin was identified with the father. Witnessing the sexual act of the parents brought on difficult breathing and the memory of her wishing to take her mother's place was evoked in the analysis.

Also in Case III of the same author there were early exhibitionistic traumata. This time it was urination on the part of older boys. This was followed by an assault when she had great respiratory reactions. After her encephalitis the thought of the phallus induced the breathing—even the sight of a male was sufficient external stimulus to set off the repressed traumatic event. Similarly in Case IV of Witzel's, the act of masturbation was always accompanied by labored breathing and by *facial spasms*¹² at orgasm. Repression was operative through incest taboo (mother-sister fixation) and through father prohibition, for the father would whip him or put him in a

¹² See a vast literature on these facial spasms, yawnings heretofore all grouped as "hysterical." Saussure, *l.c.*, who cites Gilles de la Tourettes *Traité*; Pitres' *Léçons*; Charcot's *Léçons*, and a number of others, and enters very fully into the yawning situation, tics, and respiratory anomalies. Saussure also records some compensatory relationships between the breathing and the facial spasms in the sense already noted for Case II.

tub of water when he caught him at "it." Under these punishments he stated he would become tense and then breathe as "if he had run a hundred yard dash."

Runge's case also showed similar relationships between a highly complex series of procedures and masturbation as already noted.

As a final end (purpose) sought for in the "trance" the present conception indicates a complete regression into the mother in the psychoanalytic formulation of the "Mutter leib" phantasy. The evidence at hand is still slight relative to this situation but the typical severe "anxiety"—even "agonal" in both Cases I and II—is here held to be correlated possibly with the "Trauma of Birth" conception as outlined by Rank. Special attention may be directed towards the pneumographic tracing of Case I which is evidence bearing upon the return to the "apneic" phase in the libido regression. This phase, with Staercke,¹³ may be regarded as the primary organ erotic phase. In the first breathing tension relief all of the primitive libido-ego may be discharged.

On the 28th of November, 1924, Case I had had a hard trip up from Philadelphia. He had an attack of trance in the taxicab, with a great deal of apprehension lest they (he and brother) would hit an elevated train pillar (telephone-pole accident factor). As he came into the office he was all bent over like an old man. I took hold of him while in the outer office and gave him a friendly shake, saying semi-humorously, semi-threateningly, "limber up" and also gave him a mild slap on the back, with a "brace up," etc., admonition. I noted a slight but definite expression of displeasure at this more or less commanding attitude of mine, but we went through the hour until the very end, when I asked him what had come to his mind as I poked him up. He hesitated and then finally blurted out, "I wanted to say, 'Cut it out—God damn you! I hate you!' You were so like father trying to make me get up in the morning. The G. D. S. O. B." He was quite agitated when he left.

On December 1, the next visit, he narrated with difficulty that he had had a terrible time. He did not want to get up in the morning. He did not want to come to see me. He had stayed in bed most of the time between feeling "awful." He had called his mother repeatedly to come and sit on the bed by his side and hold his hands. He had horrifying ideas of her death. He was very apprehensive about her. Sunday (November 30) he had stayed in bed all day. He called his mother frequently. He had several trance states, cold hands, contractures, face

¹³ Staercke. *Psycho-analysis and Psychiatry*. *Int. Jl. Psa.*, 2, pp. 361-415, 1921. Tr. from *Int. Zeit. f. Psa.*, by D. Bryan.

tight, muscles of mouth all twisted up. Could not sleep until 3. He dreamed a series of fragments as follows:

(1) *I was on a ferryboat with my brother. The boat hit another and started to turn over. I got my coat off ready to jump in. People were running around in great excitement. (I awakened, with my heart pumping fierce in great agony. "My heart was almost like it was when I had my delirium.")*

(2) *Down at the dock. A man was drowning. My brother tried to save him and he fell in and I did not jump in for someone else dragged him out as I was about to go in.*

(3) *I had married a man, somewhat your size. There were a lot of boats and I contemplated going to sea to run away. They were going to ship this man out. Later I was locked up for doing this, but I was free to see my parents. When I was locked up, the "fath"—no, the man was there.*

(4) *My little kid sister was in the subway crying. I recall waving my banjo at her and then I ran away as though I were teasing her about the banjo.*

The dream was accompanied by much feeling. His associations with ferryboat caused a great wave of feeling and he put his hand on his heart and could not give any association by reason, he said, of the great pain he felt there.

The dream quite evidently showed the Œdipus setting. "*He had married a man like me.*" His mother is a large stout woman, as large as myself. He had married his mother and was locked up for it—great anxiety, "*when he was locked up the 'fath'*"—here he started to say "father," but no, I (*i.e.*, the mother) was there—*i.e.*, the identification of myself and father, and married to the mother.

The turning over of the ferryboat and the drowning man (*also like me*: brother and I are about the same size and coloring—mother) was equated with drowning with the mother—*i.e.*, the return—to the mother. The details are complicated.

Here one is dealing with extremely complex primitive situations and interpretations have to be checked up from various sides. I do not know just how correct I may be in my assumption, but I have frequently understood a dream of having intercourse (by symbolic action) with a "drunken girl"—as return to the mother, just, as is well known, that men who are impotent with women, unless they are partly drunk, are being inhibited, when sober, by the mother-incest taboo. The following dream is offered as material along this line. It occurred in this series of December 8:

"It was at a party. There were lots of girls and lots of fellows. I think I was alone. I met one fellow who asked me, 'Where's your girl?' I said I would have brought her but she was drunk. I recall going upstairs and then down again after leaving my coat upstairs."

There were indications from the associations that the girl was an older sister. The man who asked "*Where's your girl?*" was suggestive of the brother-in-law. The psychoanalytic equation of up and down stairs=entering into=intercourse (party). "Lots of boys and girls"=much tension. Leaving his coat="naked" (?). Ergo: Entering naked into the female who was drunk, *i.e.*, "deep in the unconscious"—*i.e.*, antecedent to the "girl"=before the sister=mother. Whether this equating is valid I must leave for a more detailed discussion of the associations.

There were other symbolizations of the regression towards the uterine state which were never as heavily loaded—with libido—as are found in the schizophrenic regressions. They had much similarity to the periodic regressions of the epileptoid states. This is another angle which will not be discussed in this connection.

The points of chief value here are the apneic phases of regression, the trance, the partly bent position, and the greasy face, as all bearing upon the principle of dissolution of function, or diaschisis, psychologically viewed as the "return to the mother."

Hughlings Jackson's idea of the "Unity of Medicine," its modern slogan of, study the "organism as a whole," thus permits one to turn aside from the puerile question as to the "functional or organic," "mind or body" nature of the problems involved. Such ideas as "functional and organic" as categories, belong to the cradle days of intelligence.

In the conception of release of functions at older and still older levels, no matter how the upper level mechanisms are abrogated (this is a matter for our theoretical discussion of the dynamics of repression from the Ego to the Id), we have a useful monistic working conception that replaces the earlier parallelism of body vs. mind—somatic vs. functional. The rôle of early conditioned reflex activities, *i.e.*, "wishes" in their psychopathological setting thus comes into relief and can be utilized therapeutically.

A much more extended discussion of the apneic phase would be justified seeing it as a mass of untold primitive sources of conduct. In crude chemical metaphor one needs but recall what an enormous number of products (hundreds of thousands) have been isolated from

"coal tar." Thus in an analogous manner one may see the trance-unconscious states as returns to such a "coal tar" condensation period.

Here the metapsychological mental system of the Id offers its help. The Id may be conceived of as such a primitive "coal tar" system. To return to it offers unlimited opportunities for discharge of tension, chiefly by autoplasmic mechanisms, which can repudiate the more allied-to-consciousness mental systems of the Ego. Economically speaking, *i.e.*, Freud's idea of economy of energy discharge, no new adjustments to reality are needed. The patient can retire into "unconsciousness." The symptom formation—at various levels, from higher to lower—socially permitted coitus—incest coitus—heterosexual masturbation—homosexual masturbation—autoerotic organ gratification—these can all be repudiated in favor of complete submergence in the most archaic of systems for instinct mastery (*i.e.*, the Unconscious). One thinks of Hamlet's "And in that sleep of death, what dreams may come."

In order to envisage how this may take place, Freud has conceived of a subsidiary mental system—the Super-Ego—which, as Alexander expresses it, is a boundary formation—a diaphragm. Possibly in the fantastic conception of Crile,¹⁴ analogous to his "lipoid film" which he conceives of as determining all positive and negative electrical tension discharges, equilibrating his physico-chemical systems.

The study of "dream censorship" led to Freud's conception of the Super-Ego; for the question was forever uppermost in Freud's mind, why the *distortion* in the dream. Why, as a single example, was Case I in his dream of December 1(3) married to a large man (me) instead of a large woman (mother)? What prevented the conscious stating of the wish in undisguised form—in the dream—or what prevents the crude craving emerging in behavior, instead of "panting," or "breathing," or "salivation," or "polyuria," "facial spasms," etc.?

How can the conception of the Super-Ego, as a boundary line mental system, aid in elucidating these *distortions*? As Sidney Lanier expressed it in his "Harlequin of Dreams," "that peep betwixt the legs and mock the daily round."

If the Super-Ego represents a "configurational" system ready as a whole, differing naturally in each individual as to capacity, to

¹⁴ Crile. *Bipolar Conception of Life*, 1926.

relieve the Ego from the task of regulating the instinctive life, then a study of what builds it up and how it functions is of moment.

In a broad manner of speaking, the Super-Ego may be seen as a series of learned rules; as Alexander phrases it, a sort of "introjected legal code of former days which makes it possible to avoid encounter with reality by adherence to its ordinances, and by a system of rigid categorical imperatives obviates the necessity of fresh reality testing." In a sense, it is a part of that "knowing so many things that are not so" of Josh Billings' familiar quip. It is a part of every antiquated system of pedagogy, of nearly all law, of much medicine. It is represented in its quintessence in the dogmas of religious systems, and in a host of other conscious social expressions. Because external reality is always on the move, and the individual's instinctive sexual life constantly grows towards maturity; because of the tendency towards premature fixation—habit formation; because it looks inward, not outward, and hence has little or no access to reality, but is always concerned with the instinct life, the Super-Ego mental system tends to become almost reflexly automatic and rigid. It is almost structuralized function.

There it stands looking inward towards instinct, with its primitive codes of reward and punishment, separating the Id from the Ego which latter has no access to the instinct life, but is always a reality tester. As I think of Bergson's conceptions, I think I can see in Freud's Id, Bergson's Instinct; in Freud's Ego, Bergson's Intelligence; whereas Bergson says "there is no bridge," Freud says the Super-Ego "is the bridge." Had Bergson understood the dream dynamics better I conceive his idea of the unbridgeable cleft between instinct and intelligence would have been different.

In the mental systems of the encephalitic it is not difficult to trace the influence of the Super-Ego mental system. One frequently wonders why so many of these patients lack punch; they are, as it were, half asleep, so far as initiation is concerned. This lack of impulse, this semi-torpor in muscle, in thinking, in feeling even, as already noted, has been the object of many studies. When seen from the standpoint of the Super-Ego some new light seems to be thrown upon this situation dynamically. Histo-physio-pathologically it may be granted that this semi-lethargy may be in some sense related to v. Economo's sleep center notion—the central gray of the third ventricle, or wherever it may be—but even so what is the dynamic situation in larger configurational terms? What is this screen, as it were,

which forces the energy to run counter to reality and serves to push back instinctive processes to earlier stages of their expressions and will not permit new efforts to regain what has been lost? In crude terms, what has played hell with the *morale*? As already intimated the lack of impulse is only apparent. There is, as in the schizophrenic, plenty of impulse but it is inhibited, repressed. What is the mechanism of this inhibition, psychologically speaking? Pathophysiologically considered we have seen the trauma that interferes with the functioning of innumerable pathways which might discharge tension at higher levels, hence increased pressure on instinctual outlets at lower levels. Here is where the Super-Ego is active.

On the side of the incest prohibition, the Super-Ego seems to prohibit all genital sexuality. It raises up such a "sense of guilt" that the patient is pushed back to an autoplasmic form of gratification which tragically enough gives it, by this camouflage, the very thing—*i.e.*, incest wish gratification, which it denies. The symptom, "breathing," "salivation," represents a discharge of tension at the Id level. This the Super-Ego permits. But the Ego refuses to acknowledge its real nature, and in therapy, raises up resistances against revealing it. Just as in life the patient resists everything, approaching the negativism of the schizophrenic, and differing from it only volumetrically.

Some evidence has been given concerning the regressive autoplasmic respiratory-erotic gratification of the unconscious incestuous wish in Case I. Case II showed similar mechanisms in her dream life. This is accented only because, in a general sense, orientation towards the Œdipus situation affords a starting point in the therapeutic attack. No such crude ideas as taxing the patient with it is ever thought of—this much for the critics, totally uncomprehending the entire *modus operandi* of the unconscious.

The very first dream brought by Case II; long before a word had been said about psychoanalysis, or what was the matter with her, but in the period when one was concerned solely with the gross phenomena, the history taking, etc., was as follows:

My brother (the sick one, with a schizoid postencephalitic illness) *and I were in a room of our Philadelphia house. We were seated in different parts of the room smoking cigarettes. I turned my back for a moment and then noticed at the base of the mantelpiece, where the fire is, a garden hose. My brother took hold of this and*

began to sprinkle me and the whole room. I screamed and some people (four or five) came and took it away from him."

This dream was obtained on the second interview, with a group of others, and furthermore, was dreamed before she even had seen me. It, with the other fragments, had been remembered as a dream of recent date.

No memory material has ever been unearthed, in later efforts, to get at the details of the dream but at least three situations are possibly revealed. The incestuous wish—*i.e.*, the attack by the brother's phallus (*the garden hose*) is evident: the infantile urinary impregnation phantasy (*sprinkling*) is probable; in fact has been proven from later analytic material. Like many another child she thought that babies came through a urinary process. The third, least obvious, situation is the anal erotic one. *When her back was turned.*

Reviewing the last situation first, it is known that the patient had always been an extremely obstinate, self-willed girl. Her parents state "they could do nothing with her." "She always had her own way." Reference has been made to the fact she never gave up her finger sucking. She was persistently constipated. Only after several months of treatment has this improved. Enemas were frequent all during her infancy and childhood. She was stubborn, and remains even more so now in her regression. Only after six months after seeing her has she given up her bed-pan at night, whenever she wants to urinate. She has made her mother an absolute slave and tyrannizes over every one in her surroundings, through obstinacy, threatening to suicide if she doesn't get this or that, and other whims and caprices in general.

Her polydipsia and polyuria have been quite classical but need not be discussed further in this place.

As to the genital organization stages, discretion prevents a complete description. Masturbation was begun at six to seven, mutually with another girl of about the same age. She knew it was naughty but she "enjoyed it," and kept it up with this girl about a year. As the analysis of this patient is not in point, no further details are pertinent.

Enough may be said, however, to indicate deep regression to auto-plastically evolved respiratory-erotic substitutes for adult coitus (male partner, however, identified with brother as narcissistic introjection of herself). Thus she has never matured psychosexually. Fully 75 per cent of her dreams show the homosexual—*i.e.*, narcis-

sistic fixation. There is great concealed reproach (melancholia mechanism; hence possible suicide must be guarded against).

The analysis is quite incomplete and hence little light can be gained concerning the Super-Ego prohibition stages. This would entail extended discussion of the family milieu which cannot be entered into here.

PART V

QUESTIONS OF THERAPY

The views here set forth point in many directions regarding therapy. A few of these may be briefly considered.

There is little doubt as to the exogenous causal type of factor in inducing the acute onset, even though one may not be satisfied with any of the as yet isolated organisms and adopt Jahnke's dictum in this respect. For ourselves we are in agreement with this statement in spite of the work of v. Wiesner, Rosenow, Loew and Strauss, and Freeman's¹ more recent findings, apparently confirmatory of v. Wiesner's original studies. So far as the stimulus from without is concerned we rest with the assumption that *there is something*, organism or virus, which activates the process.

What this organism or group of organisms is, or may be, is not the concern of this communication, although no causal therapeutic means of combating the disease in the large sense is thinkable, unless a better appreciation of this very factor is obtainable.

It has been frequently and justly emphasized that epidemic encephalitis is an extremely grave disorder. Not grave alone because of its initial mortality, which conservatively has been estimated to be about 30%, but even more pernicious and malignant by means of after results which bring about prolonged invalidism and death in from five to ten years in at least six out of every seven of the 70% who certainly not providentially have been spared the initial lethal results. Under present means of control, then, happy may be considered the lot of those who die.

The aggregate of after resulting invalids is very large. Freeman,² in his paper before the American Neurological Association, has quoted from English sources,³ at least 5,000 cases were reported in 1924 in England, and innumerable small epidemics have occurred in the United States and other countries. Thus the therapy, so far as the larger issues are concerned, is one full of significance, since malignancy is the rule rather than the exception.

¹ Evans & Freeman. Studies on the Etiology of Epidemic Encephalitis. I. The Streptococcus. Public Health Reports, 41, 1926, 1095.

² J. A. M. A. 87, 1926, 1601.

³ London Letter—J. A. M. A. 85, 1925, 529.

Experience, thus far accumulated, seems to show that the parkinsonian syndromic evolution represents the most malignant of the chronic situations. As yet, complete analysis, statistically, affords few certain figures as to the prevalence of this outcome. It is by no means small, and is to be seen chiefly in sanatoria, psychiatric wards and mental hospitals. The behavior disorder group, especially when the initial onset occurs in childhood, is certainly not less appreciable, even if hidden behind police courts, criminal activities, or lost in the records of our hundreds of state hospitals for mental disorders. The vast medley of other forms of involvement to which our respiratory forms belong is too well known to need citation.

The lesson to be learned from the clinical records certainly points towards some factors of chronicity, which from one point of view reminds one, analogically at least, of the persistence of the treponema activity in such chronic types as paresis or tabes dorsalis.

But, just as psychiatric science is still dumb concerning the factors relevant to the possibilities of persistence of spirochetal activities in paresis and tabes, so also in the chronic or postencephalitic syndromies one is left much in the dark as to why the later developments come about.

There are observations, it is true, from the pathological disciplines that are not altogether irrelevant in this situation. In paresis and in tabes one finds evidences of a persisting inflammatory character: so also in malignant cases of epidemic encephalitis which have come to autopsy, indications of persistent inflammatory reactions are not wanting. The studies of Lévy, Scholtz, Hohman, Meggendorfer, Wimmer, and lately of Freeman, to cite but a few, are positive in this respect. Freeman's contribution collects some of these.

What this other factor or factors may be is definitely submerged. Whether dispositional (here meaning ontogenetic factors) or constitutional (here meaning phylogenetic factors) remains a problem for the future.

At all events I find no pertinency in raising a purely academic discussion as to whether one should speak of chronic encephalitis, or postencephalitic syndromies. Certainly the paresis analogies are not of much service, for definitely paresis is not *alone* a chronic treponema situation, else why should practically all of the later students of paresis, Kraepelin, Plaut, Kolb et al., be searching for the unknown x in bringing about the more specific type of syphilitic disease we call paresis, to say nothing of the metasyphilitic conjec-

tures of previous decades. But as stated, here is to be found no attempt to settle these questions.

Only one point needs remain in the foreground, and that is that unquestionably certain cases must be regarded in the light of a chronic inflammatory process, and that this process needs more light to be combated.

Certain statements have been made concerning this already, but supposing one were faced with a patient, such as either one or the other of the cases here reported as samples. What shall be done? To even list the many things that have been done would be to make divine providence grin and say, "What fools these mortals be." Milk injections, protein injections, serums galore, belladonna, hyoscine, scopolamine, luminal, autohemotherapy, influenza antigen, sodium nucleinate, urotropine, salvarsan, neosalvarsan, silver salvarsan, electrargol, cacodylate of soda, malarial organisms, argotropine, morphine, codeine, veronal, allonal, cicutine, arnica, inulin, cutting the sympathetics, the phrenics, spanking, cold douches, electrical sparks, surgical operations on appendix, on brain, on thyroid, locking them up, disciplining; a vast medley of means indicative of man's incompetencies and "magical" efforts to compel "cure" through his inadequacies to read the secrets of nature behind a disease process! One cannot condemn one for trying things, however, in view of the malignancy of the process.

I have seen cases in which each of these procedures has been tried, or recommended, and where "fools rush in where angels fear to tread," all to no avail. Thus in a patient of fourteen with pronounced "behavior disorder," with a respiratory syndrome, read this fragment of a letter from a presumably competent head of a sanitarium:

"If I could only resort to the old-fashioned style of punishment with her, I know it would do her good."

"If I was as severe with her as I should be they would think I was cruel and inhuman, but she certainly does require sharp discipline, and I feel that is her one hope."

Is not this reminiscent of the Middle Ages and the methods of curing witches? Nay, even more antiquated—since in pre-Hippocratic medicine they tried to chase out devils by noises, by stinks, by chains and other force measures. One might just as well fancy himself a Joshua and command a measles eruption not to appear, or prohibit the formation of a swollen Peyer's patch, or a tuberculous

hemorrhage—as attempt to treat these patients by “coercing them” —“breaking their naughty habits”—or by disciplinary measures, etc., etc. Unfortunately some morons still can prosper in the medical profession.

So the conclusion that is first to be drawn from these few remarks is that one needs to get a sympathetic understanding of what is going on in these patients with damaged brains in order to hope to get anywhere.

As Hughlings Jackson has so well said of aphasia, the patient is doing the best he can with the well part of his brain that is still functioning, so our encephalitic cases are doing the best they can with those pathways which are left open for functioning.

Both the positive and negative aspects of functioning must be duly valued, and dealt with accordingly.

In view of our utter inadequacy at the present time to control the process, in spite of some seemingly brilliant results obtained from time to time, in most of which that have come to my attention, however, one is unable to really judge of the final outcome, since so many patients make an apparently excellent recovery from the acute phases, followed, it may be many years later, by the onset of the sequels, other considerations force our attention in another direction.

Turning to the *soil* in which this activation takes place, the material at hand permits hardly more than conjecture or speculation. Since neither conjecture nor speculation are to be feared or spurned, but if controlled may offer possibly the only real method in science for advance, we are not loath to utilize them. Many considerations have been advanced concerning the subtle constitutional backgrounds assumed to facilitate the reaction. Up to the present time I find none satisfactory.

But it is not our purpose here to deal with the acute situation. We are concerned with the chronic types, and more particularly those showing persistent respiratory disturbances.

These latter, however, make a thoroughly artificial group from the usual viewpoints. If one utilizes the psychoanalytic conceptions here spoken of under psychopathological considerations, it may be conceivable that these respiratory cases may be considered as a group—but even this is doubtful, and from the available material cannot possibly be proven as yet.

Certainly the myoclonic tic types of breathing disturbance are not to be allied with the majority of the respiratory forms here discussed.

They may be isolated, however, and attention be called to a temporary relief obtained in some of these cases by phrenic freezing, as reported by Gamble, Pepper and Muller (*l.c.*).

The respiratory situations develop in all types of people. Just as "Mrs. O'Grady and my Colonel's Lady are sisters under the skin," all people are alike at a respiratory level. To argue about artificially delimited types with such opprobrious titles as neurotic, psychopathic, hysterical, hereditarily disordered, etc., etc., is, we believe, a rationalization born of ignorance. It belongs to the Morel "degenerée" era of generalization. Even Kretschmer's or other similar anthropological body formation type conceptions offer as yet no vantage ground for understanding predisposition. "Schizoid" and "syntonic" conceptions serve little better. The psychoanalytic study of "disposition" as revealed through character formation factors is the one lead which seems to offer some understanding of the situation.

Hence our chief reliance is based upon as wise an application of psychotherapeutic principles as may fit the grade of damage—somatically speaking, in the machine.

Should the results of the damage show through some evident or even highly complicated endocrinopathy it is quite conceivable how a specific and intelligent hormone therapy can bolster up a somatically damaged organ, or its neural mechanistic control apparatus.

Our knowledge of the switchboard of the vegetative nervous system in the mesencephalic and related regions is widening rapidly and a host of visceral deficiencies of various grades of intensity are showing up. The literature is large, and I shall simply refer to Schoenemann's¹ most recent contribution.

Through such intensive study useful facts may be found through which one can bolster up some impaired organ activity, either by a substitutive prop or by relieving it of excessive functional necessity. Thus a large number of encephalitis cases show liver involvements—(10% as estimated). After determining, if possible, the grade of functional loss, an adequate adjustment may be made possible—dietary or hormonal, or what not, as future study may reveal. Other

¹ Schoenemann. Funktionsprüfung innere Organe bei Folgezuständen nach Encephalitis epidemica. Zeit. f. d. g. N. & P. 105, 1926, 175.

organs are similarly implicated, peripherally and centrally. To the possibilities of central implication of visceral pathways I have called attention ever since Wilson made his initial contribution, and all of us know somewhat of Claude Bernard's "picure."

But the psychoanalytic findings reveal an extremely interesting situation. Namely, that the organism is doing the best it can with the parts of the body still capable of functioning. Function, in a sense, is crowded over a fewer number of pathways. In a rough metaphoric sense, the traffic has to be handled by fewer lines, since so many of the tracks are blocked temporarily or permanently, or the switches won't work to disperse the energy advantageously.

Attention has been called to the effects of "regression," and to the workings of the "repetition compulsion," because by the loss of dynamic capacity (partly in Janet's sense of the lowering of physical energy—metaphorically, however, only), the higher pathways of sublimation are either somatically blocked, or dynamically non-traversable, because of the low level of economy of expression—hence the utilization of the low level respiratory pathway to handle specific libido situations. These may arise from time to time from the environmental stimulus plus the stimulus from within, *i.e.*, the instinct drive.

Hence the great value in therapy that may result from a character analysis type of psychoanalysis.

The respiratory behavior is but one of the symptoms even in the so-called "respiratory" cases. In point of fact all of these patients manifest behavior anomalies, usually quite pronounced, especially antecedent to the development of the respiratory syndrome. In a most specific sense we are inclined to believe that the more typical respiratory forms, such as Case II for instance, may represent a last trench of regression. Further regression would result in dissociation and a psychosis would ensue. As is well known, shorter or longer psychotic dissociations frequently occur; they are either of the nonproductive, narcoleptic, epileptic or tic types, or they are more pronounced and assume manic, depressed, schizoid or catatonic features.

These behavioristic accompaniments also demand some psychotherapeutic consideration, for although the most outstanding manifestation may be the breathing, the other features are there and are often difficult to handle. Anyone who has attempted to analyze any of the "so-called" "behavior" type knows what devils such indi-

viduals may be with their sudden impulsive violent outbreaks, which may last but a few seconds or persist for hours.

Our remarks about disciplining these cases, locking them up, etc., may be re-emphasized. We have seen such cases go through acute dissociated psychotic reactions under such misguided therapy, reminding us strongly of the picture so well depicted by Galsworthy in his play, "Justice." Sadistic attitudes even supposedly subtly disguised behind soft gloves and smiling faces, only bring about even more pronounced sadistic encounters with katatonic hate syndromes. Most hospitals have removed straitjackets even for manics. A discipline of empathy correlates is an entirely different thing. This becomes real education, in the *e-duco* sense, and is the only discipline that really avails. Some attributes of the Super Ego system have been damaged and their reappearance in others is a red rag to a bull to these patients.

To prod and poke these individuals out of bed gets nowhere. The behavior of Case I, even to mild promptings to stand up straight, is typical of the whole group reactions to this disciplinary method and has been narrated elsewhere in this study. Without wit or humor these patients cannot be helped, and nothing is more stupid than getting a nurse or companion who lacks a sense of humor.

Other behavioristic anomalies may be dealt with in the general analytic treatment. They come out in the course of the analysis. Thus in Case I the roots of the staying in bed repetition compulsion were revealed. They were overdetermined. As the different determiners came into the conscious field their dropping out of the picture caused marked amelioration in the conduct. Case II, a severe regressive situation, has made no progress in this regard up to the present time. Her narcissism is almost as profound as a schizophrenic, and months if not years may be required to recondition her pleasure principle reactions.

The Super Ego control in Case I relinquished somewhat, in that masturbation ceased to be regarded as so heinous, at the same time being more readily controlled. Even heterosexual contacts took on an entirely different internal aspect. They were less compulsively sought in phantasy; self-denial was more effective and outlets of a more artistic nature handled the urge very satisfactorily after analysis. Singing was encouraged and thus gave added outlet to the respiratory libido. Certain breathing techniques may be of service here, but I have my doubts about their ultimate issues. As in

Yoga medicine, they may cause displacement of the symptom and bring about adjustment with perversions, or even mystical psychotic situations. The patient's conduct may be better, but their creativeness may be damaged.

Much more might be added along these lines, but as the present purpose does not contemplate any discussion of psychoanalytic technic we close with the statement of the conviction that a psychoanalytic mode of approach to these cases offers the most hopeful avenue for success.

We do not entertain the illusion that it will master all of the cases—many have suffered such great brain injury that they are practically nontreatable save by such restrictive measures as sanitarium for social reasons, or by drugs such as luminal or their ilk for reasons of medical inadequacy.



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