TREMOR FOLLOWING EXPLOSIONS

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THE diagnosis of the functional disturbance known as Tremor which so frequently follows proximity to explosion is one which presents several problems for solution. Is this Tremor of hysterical, emotional, organic or neuropathic origin? Can it be simulated? What treatment ought to be employed? and, how ought one to deal with Tremor-stricken soldiers?

Without supplying a decisive answer to any of these questions Henry Meige in the following history of a patient so afflicted gives several indications destined to facilitate the clinical analysis of this disturbance, and incidentally certain military judgments.

On the 13th January, 1915, Corporal S. and his men were occupying a trench when the bursting of a torpedo above him threw him violently against the wall without wounding him, although several of his comrades were killed. It is not certain that he lost consciousness; he remained felled to earth until an adjacent communication trench was sufficiently completed to admit of evacuation. He had begun to tremble a short while after the explosion. Back in the trench he still trembled. In spite of this he remained there for a fortnight trembling all the time. He lost appetite, became thin, and could no longer handle a rifle. He was not evacuated for a month. Then, as his condition did not improve, he was sent to various institutions, until the 13th April 15 found him in the Neurological Centre at Villiers-Cotterets where he remained for two months.

There he was examined by Guillain who supplied the following information. This man's complaint had been diagnosed as "Hysterical chorea." He trembled in every portion of his body. The patellar and achilles reflexes were active, those of the upper limbs were normal, and there was no disturbance of sensibility. There was neither tachycardia nor bradycardia—only a state of emotion so keen that it accentuated the tremor. This became particularly violent at the sound of cannon, or the bursting of bombs in the neighborhood. No improvement was recorded during his stay at Villaret-Cotterets. Lumbar puncture revealed a normal cerebro-spinal fluid without hypertension, non-hyperalbuminous, and devoid of cell. On the 19th

June 15, he entered the Salpetriere. A month later he was sent to a civilian hospital, where he stayed until the 24th September, from whence he went home on convalescent leave for a month. He returned to the Salpetriere on the 15th December, 1915. During the whole of this time, his condition had not altered in the least from what it became after the explosion which caused the mischief—a year previously. He trembled continuously.

This tremor, apart from any casual emotion, was visible in the four limbs, with a slight accentuation in the upper-right limb, and the lower left. It used to cease during sleep, although it continued in the recumbent position just as in that of sitting or standing. Toward evening it became more marked, and the patient only managed to get to sleep very late. The head trembled only slightly. There was a slight and irregular twitching of the eyelids and tongue which did not synchronise with the tremor of the limbs. There was no nystagmus. In order to lessen the trembling of the upper members, the patient used to hold his forearms at right angles to his arms, firmly against his sides. When the trembling of the lower limbs became very powerful, he used to get up and walk about. Any movement, such as seizing an object, carrying a spoon or glass to the mouth, used to exaggerate the disturbance. It then recalled the intentional tremor of the insular sclerosis in its most intensified form.

But the principal cause of the exacerbation was emotion. A sudden noise, a sharp command, the mention of a stay in the trenches would bring about a veritable motor crisis. The patient's body would jerk in the most marked manner, and his legs would tremble so as to almost cause loss of equilibrium; then this excessive agitation would gradually die down, although the original tremor would remain. The search for the reflexes was a difficult matter because the slightest percussion would cause the most violent jerkings. There were no disturbances of sensibility, and perspiration was easy and abundant. The pulse varied according to the degree of the tremor. In repose it would be 60, while a sudden rap on a table would bring it up to 120."

In order to find out how to deal with such a case, it is necessary to analyse successively the trembling proper and the paroxysms which occur on certain occasions.

These tremblings used to be classed as belonging to a classical type already nosologically recorded with the utmost precision, and it is true that these types are observed clinically, although the hybrid

or atypic forms are less numerous. The Parkinsonian type is one of the most characteristic because of the regularity and the synchronism of the oscillations in all the segments and especially their predominance in the extremities, particularly the fingers.

Certain Tremor-stricken soldiers present this type, and the observation of agitated paralyzes dates further back than yesterday, several cases having been noticed at the Siege of Strasbourg in 1870. The etiological features of this present day tremor favour the idea that its symptoms are identical with those of Parkinson's disease. The latter syndrome is regarded to-day as the manifestation of an organic lesion. If the situation and nature of the lesion are still uncertain, yet their striking analogy to these pseudo-bulbar and lacunar disease admits of the possibility of lesions in the vicinity of the central gray nucleus.

It is perfectly admissible that the shock and concussion caused by violent explosion can produce more or less lasting disturbances in the same region of the encephalon, acting either directly upon the nervous centres and tracts, or indirectly by means of the vessels or ventricular liquid. This is why a Parkinsonian tremor following upon shell-burst points to the possibility of an organic lesion. The case just described, does not favour this idea, but examination of the cerebro-spinal fluid did not take place until three months after the accident. Nevertheless the symptoms of this case differ appreciably from those of Parkinsonian Tremor; there is neither regularity nor synchronism in the oscillations—the characteristic trembling of the fingers particularly being absent. Finally whilst the Parkinsonian illness is a progressive affection, where the Tremor gradually invades all of the members, in this case, as in the majority, the condition of the patient undergoes no change. The lesion, if lesion there be, remains as it was in the beginning.

This remark is important both as a prognostic and as a guide to military decisions. Moreover, it is evident that in the patient under discussion, the tremor is of the type known as "intentional." The disturbance is accentuated by any spontaneous movement, while it becomes excessive if, for example, the patient is asked to convey a half-full glass to his mouth, a fact which is no doubt explained by his fear of failing to accomplish the act safely. In this respect the Tremor can be compared to that occurring in multiple sclerosis, but there is no other clinical sign which bears out this resemblance. As far as the rest is concerned, Meig does not consider that the "in-

tentional" nature of the Tremor is a very safe guide to diagnosis. More often than not, it is a mere manifestation of the patient's inability to overcome his fear of failure of accomplishment. Thus, in such a case, the Tremor is nothing more or less than a reaction of emotional origin, which often plays an important part also in subjects with multiple sclerosis also in the majority of other Tremblers.

This exaggerated oscillation upon attempted movement is also found in the Tremor which accompanies organic affections. It is present in the disease of Freidreich, in lesions of the cerebellar apparatus (acute Tremor of Reginald Miller). In all cases of tremulous neurosis, hysterical Tremor and Tremor of Degenerates, etc.). This sign is well worthy of being noted, although too deep a significance must not be attached to it. The same is true of the frequency and extent of the oscillations; these vary according to the patient and the occasion which calls them forth. On the contrary, their regularity is more important and speaks in favour of an organic origin. It was noticed a long time ago that neuropathic tremblings, and notably those accompanying hysteria were essentially polymorphous. At this juncture, it is well to point out the abuse which is made of the term "Hysterical Tremor" to label Tremors the nature of which is unknown. It is very doubtful whether Tremor is one of the charactes of hysteria, although it is possible that in certain subjects it may have been evoked by suggestion. One thing is certain however, viz., that in the vast majority of cases Tremor resists any and all Psychotherapeutic tentatives. Even the best-directed will fails to overcome it; if ever a short respite is gained, it never lasts long enough to lead us to anticipate material modification. Such was the case of the soldier under observation; hysteria was not at the bottom of his trouble. "Let us limit our statements," says Meige, in concluding his remarks, to saying that this man's trouble was not a case of Parkinson's tremor, nor yet of cerebellar commotion, that he presented no sign of multiple sclerosis, nor of general paralysis, Grave's disease, nor of intoxication reputed to be tre-ogenic, saturnine, mercurial, ethylic, opotherapic, etc., and let us add that neither heredity nor congenital deficiency, nor, in view of his age, senility, played any part therein.

Thus, although the character of this Tremor resembles those considered as neuropathic manifestations commonly observed in traumatic neurosis; nevertheless, given its etiology, tenacity and immutability it is not impossible that it is the consequence of some material deterioration of the nervous system caused by a violent explosion.

What is the explanation of the paroxysms which, in the case of this soldier, sometimes take place? They are evidently emotional reactions, and it is no longer a question of a mere trembling, but of jerking. A sudden noise, a surprise, an unexpected order, a painful memory of incidents of the war, all serve to bring about this phenomenon. It is a sudden movement of the whole body manifested more or less intensely on any of these occasions, varying according to the impressionability of the patient. In some subjects it is merely a sudden jump; in more emotional natures the first jump is followed by a series which gradually decrease; this is the jerking movement, or, as Littré aptly describes it—"The sudden agitation of a person profoundly moved."

The analysis of this jerking phenomenon is interesting, and it must be distinguished from Tremor.

The elementary motor reaction which produces it is due to a sudden contraction of nearly all the flexor muscles. The arms stick to the sides of the body, the forearms fold back on the arms, the fingers close, the thighs and legs close up together. The trunk curves forward except in a few exceptional cases; the shoulders are raised and the head lowered. The facial muscles also share in the general contraction; the eyelids close, the teeth and lips shut firmly. In short, the individual replies to an emotional shock by a general defensive reflex movement by which the body seems to shrink into itself. This phenomenon of retraction is found in all grades of living creatures—beginning with the amoeba—when threatened by sudden danger. It is followed by a more or less sudden and complete relaxation. Sometimes it is repeated several times in succession with growing intensity, followed by diminution. Such is the jerking phenomenon. This is exactly what is observed in this soldier, but in his case, the motor phenomenon is excessive and repeated a great many times, assuming the aspect of a general convulsive crisis which subsides only very slowly. When seated or lying down the emotive reaction has all the characteristics described under the name of jerking. When standing, the jerking of his lower limbs threatens his equilibrium. He then has the appearance of one suffering from that form of *astasia*—*abasia* or *pseudo-chorea* incorporated under the name of *hysteria*. After the jerking crisis, he gradually calms down. There remains only the Tremor, which is unceasing.

Gilbert Ballet has stated that certain tremors can be considered as "*Mimicry of fear*." This idea is quite correct as re-

gards the emotive paroxysms of our patient. They can be considered as the echoes of the initial emotion which he felt at the explosion of the torpedo,—emotion aggravated by commotion—and followed by the agonising wait at the foot of a mine trench surrounded by dead or wounded, for aid which was merely problematical. In the course of these paroxysms it was noticeable that his expression was undoubtedly that of terror. But if this explanation is admissible for the jerkings, it is not certain that it accounts for the perpetual tremor which by its existence and tenacity points to a durable and permanent perturbation of the neuromotor apparatus. It is not less true that a large number of cases of Tremor are, like the jerking phase, of emotional origin. Trembling itself is one of the common manifestations of emotion, very varied however, in intensity and localisation. It may affect the hands only, or the jaw, thereby causing the teeth to chatter. When the lower members are affected, the knees knock together. Sometimes it merely takes the form of very rapid and feeble shaking, and other times it develops into a veritable convulsive crisis. But whatever be its form, this post-emotional motor reaction is transitory; it generally disappears more or less quickly as soon as the first shock wears off.

When a tremor of emotive origin becomes settled and lasts for months or even years in the absence of ascertainable hysteria, it is difficult not to ascribe it to the existence of an organic disturbance. The emotive shock may suffice to produce this, a fortiori if there is added to the emotion a commotion accompanied by a sudden change of pressure as is the case in the explosion of large projectiles. (See Tom A. Williams *Differentia of Phobias and Obsessions*, Internat. Clinic, 1919, Vol. IV, where after years' duration, these are made to disappear in a week or so.)

The emotive nature of a tremor is confirmed first by its origin, then by the influence of emotional shock, which is capable of provoking it anew or of exaggerating it. Finally, one ought to seek for the signs of emotional constitution, the value of which Dupre has demonstrated, viz., hyper-reflectivity, tachycardia, sudden vaso-motor and secretory exaggerations. The majority of these signs were present in this soldier. But, in this case it cannot be proved that they did not exist before the accident. Neither is it impossible that the emotive syndrome was created totally by a violent emotion.

In analysing a case of Tremor, a mental examination is also necessary. In the case of our soldier, the man was quite aware of

his Tremor and its exacerbations caused him intense sorrow and humiliation. He was wretched at not being able to control the movement of his limbs. He suffered greatly on account of this powerlessness and particularly at seeing himself ridiculed by some of his companions, who took a malicious delight in bringing on these paroxysms. Therefore he lived in a solitary fashion, seeking only to efface himself. Dread of provoking his Tremor became with him a veritable obsession, in the psychiatric sense of the word. And it is true that if this Tremor had all the appearance of the shaking of fright, it is equally certain that this man was afraid of his tremor and its jerking phase. He presents, therefore, all the symptoms of the psychopathic state which Henry Meige described some years ago as Tremophobia, of which a brief description is as follows:

"This variety of phobia is not rare in subjects who are troubled with trembling of the head or limbs. Tremophobia participates in all the characteristics of obsession, resembling particularly the Ereuthophobia (fear of blushing) of Pitres et Régis. One sees it especially in persons of emotive constitution, and who thus have a predisposition to it. The physical phenomenon engenders the obsession which, in turn, amplifies the comatic reaction, while the exaggeration of the latter reacts similarly on the mental disturbance. There is thus created a vicious circle of reciprocal psycho-physical reactions, which ends in an evil state of obsession. Tremophobia can begin with a genuine tremor, one so-called constitutional, hereditary, neuropathic, senile or any other variety allied to a tremogenetic affection, or like Parkinson's disease, multiple sclerosis, Grave's disease, etc. The fear of trembling is also linked with ideas of humiliation, of loss of prestige, nosophobiatic anxieties, etc. In short, Tremor, be the cause what it may, can become, in subjects predisposed thereto, the beginning of an obsessive psychopathic state, that of Tremophobia. This description is applicable to the patient under observation. He is not only a trembler, a jerker, he is—to use a neologism—a 'Tremophobe.'"

Cases of this type are numerous at the present day. The following is a second example:

B——— was evacuated from the Front because of Tremor following upon prolonged bombardment. He was an artist, who for long months had cheerfully borne the hard life of the trenches, but there came a day when, after a particularly heavy firing, "the machine got out of order" to use his own expression. He began to tremble. The Tremor persisted, being particularly visible in the

head and upper members, especially the head, which vibrated laterally in varying degrees of intensity. The patient tried to master it by stiffening the muscles of the neck, but only with partial success. The trembling of the hands also was comparatively slight, not being greatly exaggerated by movement, capable of partial control by powerful contraction. On the whole, this man seemed to be in a state of controlled vibration. This bears some analogy to Parkinson's disease, but only superficially. Any doubt as to the emotional nature of this Tremor is dispelled by the co-existence of emotional, circulatory and endocrine reactions, and finally by a psychopathic state which the patient himself analysed exactly, as may be seen from the following:

"For nearly four months, ever since I was evacuated from the Front, my nervous state, which I thought would last barely a fortnight, still persists, although slightly ameliorated. There is no doubt that I am calmer. My heart does not beat as it used to do, neither do my hands perspire so profusely upon the occasion of the slightest emotion or effort. At first, the slightest shock would make me tremble uncontrollably. I can master the Tremor for a few minutes, but no longer. The noise of the doors of the Metropolitan, a wavering light, the whistle of a locomotive, the yapping of a dog, a childish peevishness, all have the effect of arresting the Tremor. The theatre, music, the reading of poetry, a religious ceremony—have exactly the same effect. I went lately to see a flag placed in the Invalides, and before the moving spectacle, I fancied myself cured. Then all of a sudden, I began to tremble, and to such an extent that I was obliged to sit on the ground and cry like a child. Sometimes the tremor came on suddenly without cause. For instance, I went to a shop with my wife to do some shopping. The crowd, the lights, the rustling of silks, the colors of materials were all a delightful contrast to our life of misery in the trenches. I chattered and was as happy as a schoolboy on holiday. Then, suddenly, without any reason, I felt my strength going. I stopped talking, I had a pain in my back, I felt my cheeks become drawn, my gaze became fixed, and the Tremor returned, and with it a feeling of great physical discomfort. At such times, if I can lean up against something, sit down, or especially lie on my back, the tremor diminishes or even stops pretty quickly. . . . I feel uncomfortable under three circumstances—upon waking after ten to eleven hours sleep; then after meals, especially good ones. Finally and above all, under the electric douche. There, as if by magic, my ideas become clear, happy and powerful. I

feel myself again. This lasts for an hour or so, and then I fall back to my former unhappy condition."

A very good description of Emotional Tremor.

This is where the Tremophobia comes in:

On a tram, or in the Metro, I feel that people are looking at me, and it makes me miserable. I know that my state inspires pity. One good woman offered me her place. I was touched to the bottom of my heart. But when they look at me and say nothing, what are they thinking? This uncertainty causes me a good deal of suffering. If only I can talk, I don't feel it so much, because they can see then that in spite of my trembling I am not a poltroon. What a sad state to be in.

There is no doubt that Tremor of this type is accompanied by an amount of moral suffering which it would be unjust to ignore.

A final question arises. What is to be done in a case like this? According to Meige medicamentary means have little hold on tremor whatever their nature may be. The only medicaments which have a sedative effect, and that only a short one, such as hyoscamine, hyocine, duboisine scopolamine, etc., ought to be used with the utmost caution. In one case static electricity produced a very happy result, but this is not invariable. Finally, from a military point of view, the following seems to be the best method to adopt:

First—A period of observation—of the characteristics and evolution of the Tremor. If the latter does not abate, grant leave of convalescence for one or two months. Then a fresh period of observation lasting for about a month, *under the same doctor*. After that, if the Tremor persists with the same characteristics, temporary discharge should be granted. When the man is called up for re-examination it is desirable that the Doctor who previously attended to him be called upon to give his opinion. We can do much better than this (see loc cit "Phobies.")

In concluding his article, Henry Meige makes the following remarks regarding the medico-legal decision to be made with reference to Tremophobia:

"When it is a question of Tremor following upon traumatisms, notably in cases of industrial accidents, one must beware of simulation. In the second place, an appreciation of the motor disturbance must be arrived at in order to know where Tremor ends and Tremophobia begins. In cases of Tremor following upon accident, it is not unusual to find that the subject, in the course of medico-legal examinations has

cultivated voluntarily and consciously a manifestation of the effection with a definite end in view, and at other times it may be a return of the malady to which Brissaud gives the name of *sinistrosis*. But in other patients, Tremophobia and psychopathic disturbances may also serve to exaggerate the Tremor. The Doctor-Judge ought to know this."

As to the evolution of the incapacity which results from Tremor, this varies considerably in accordance with the intensity and the localization of the motor disturbance, and whether it is influenced or not by movements adapted towards the fulfilment of a definite end, by emotional shock and finally according to the patient's profession. If it appears impossible to fix in advance a percentage of invalidism, it will be necessary to devote to Tremor, chapters in greater detail than these which appear in the currently-consulted military hand-books, in order to arrive at a correct appreciation of the remaining physical aptitude, or for the necessity of preparing the papers of discharge. (See Treatment of Military Hysteria, *Military Surgeon*, Nov. 1919; also Emotion in Warfare, *Jour. of Abnormal Psychology*, 1919.)

PHYSIOLOGICAL FACTORS IN TREMOR

I. A type of Functional Tremor of somatic origin is that provided by the injection of adrenalin. It is a question whether this has any relation to a possible modification of muscular tonus by the influence of adrenalin upon the sympathetic fibres which now we know do enter the muscles, perhaps destined for the sarcofibrils. On the other hand, the phenomenon may be a chemical one due to the oxidase which some experimentalists believe to be an important constituent of adrenalin.

II. To be compared with this tremor is the coarse intension tremor of insular sclerosis, the physiological basis of which is regarded as an absence of proper insulation due to the destruction of the white substance of Schwann, whereby the nerve impulses are rendered irregular. This interpretation is particularly favored by those who believe in the identity of nerve energy with electric energy. The Tremors seen in alcoholic neuritis are the more explicable in a similar fashion, namely, that the alcohol has modified the lipoid material of the white sheath so that it ceases to insulate adequately. The extreme of this condition is seen in the anatomical appearance of alcoholic neuritis, in which the white sheath has first broken down into droplets and eventually disappears.

III. A different set of considerations must be borne in mind, however, in relation to the influence of the cerebellum upon tonus, which leads to the jerky movements, the disorder of which function produces dysergia. This disorder should be opposed to that derived from disturbances of the cerebrum, for the function regulated by the cerebrum is not regarded as that of tonus which is controlled by the sarcoplasm, but is believed to be the clonic function which permits of rapid intentional movements and is regulated by the myofibrils.

An analysis of these respective elements is necessary if one is to correctly envisage any case of tremor other than one of psychogenetic type. (See forthcoming Book on Disorders of Nervous System in Warfare.)

THE TREATMENT OF TREMOR

In several French and at least one British clinic, attention to the practical aspects of chronic tremor has been stimulated by the questionnaire which was sent by me in November, 1917. In one of these centres, the study of the question has led to the conclusion that the vast proportion of cases show that a Tremor is in reality within the patient's control if a sufficiently powerful stimulus is brought to bear upon him. To this generalization there are only two exceptions, namely those Tremors due to organic disease of the nervous system which is characterized by very distinct and unmistakeable signs, and secondly those Tremors of emotional provokatis, which show themselves as very fine oscillations. These are in all probability due, not to the emotion itself, for in acute emotional conditions the Tremor is of a much coarser kind. They are probably, therefore, in reality of chemical mechanism, being of the same type as those seen in toxic conditions. They do not differ in any way from those exhibited in Grave's disease. They are accompanied by tachycardia, flushings, hyperhydrosis, insomnia, restlessness, over-excitability, emotionalism and even progressive emaciation, and these patients are indistinguishable from the mild cases of hyperthyroidism which are seen so frequently by *those who look for them* in civil practice.

Hesitation regarding the pathogenesis of tremor in many cases which do not possess the usual characters of organicity nor of toxicity, has been largely due to the fact that there has been failure in them of the treatment which succeeded in cases which seem similar. This argument, however, is not valid, for there has not been taken into

account the variations of individual resistance to psychotherapeutic interventions, and that the simple slight and often half-hearted intervention of suggestion, persuasion, reinforcement by electric apparatus, the example of the cure of other patients which is sufficient in the majority of cases may be quite insufficient against the more resistant type of person. Reflection upon this issue, the result of my questionnaire, led the chief of one Neurological Centre to recall several patients whose Tremor he had concluded was organic because he had failed to cure them. Reconsideration of the matter led him to believe that the Tremors in question must be purely functional and their regulation within the patient's power. He accordingly retreated those patients much more intensely, pushing the appeal to the utmost, and in all cases ultimately succeeded in causing the complete disappearance of the Tremors, which was a complete proof of their non-organic nature. One of these cases was particularly instructive; for the man had received a wound in the left parietal region which apparently was the cause of a clonic tremor of the right arm, which persisted even in sleep. Further there was a history of Jacksonian attacks. This man had been discharged from the army under the belief that his condition was due to the wound in the head. A colleague, however, insisted that there were no organic signs whatever, and that the Tremor furthermore seemed to him such as might be reproduced intentionally. The patient's power of inhibition was very strongly stimulated by means of very powerful faradism which he knew would be prolonged for several hours unless recovery occurred as had been the case with other patients. The result was that after an ineffectual struggle he began to control the Tremor, which completely and permanently ceased at the same sitting.

The *principle of treatment* depends upon the fact that when intentional and purposive movements are made by such patients under strong stress, there is always a tendency to cease trembling. It is a reaction similar to that which occurs in paralysis agitans, in which the trembling usually ceases when co-ordinate movements are made.

METHOD OF TREATMENT

Movements are compelled by means of a desire to avoid the painful stimulus of the faradic current. The physician orders a movement, such as that of lifting the leg, places behind the limb two electrodes held in his hand. The tremulous oscillations of the pa-

tient cause his limb to touch the electrodes from time to time, which is exceedingly painful. As a result, he can scarcely help steadying his movements. By means of a series of back and forth movements directed by means of the electrodes the Tremor entirely ceases. When this occurs, the patient is ordered to make movements unassisted. The mere threats of the proximity of the electrodes usually suffices to prevent further tremor. The patient thus exposed in his pretention that he could not avoid the Tremor, knowing that the Doctor knows that he can do so, and convinced himself that if he does not stop the Tremor further pain will be inflicted, does his best to cease trembling, and invariably succeeds, as now the motive to stop the trembling is greater than formerly was the motive to tremble. The psychical process is not really different in principle whether the patient is an active simulator or whether he really believed that he could not cease trembling.

Thus it can safely be said that if there is no local exaggeration of the reflexes, no rigidity of the muscle of the lead pipe type, no signs of disturbance of cerebellar innervation, that any Tremor in which the movements are more than vibratory in extent, is psychogenetic, and is susceptible of and can be made to disappear when the proper means are used. It is also safe to affirm that a tremor which is merely vibratory is not psychogenetic, and is in all probability due to chemical modifications acting upon the nervous system, and therefore demands medical treatment as well as psychological. (For diagnostic data see Tom A. Williams, *N. Y. Med. Jour.*, March 6th, 1920.)