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TICS AND THEIR TREATMENT

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Содержание

PREFACE 5
AUTHORS' PREFACE 8
NOTE BY THE TRANSLATOR 9
CHAPTER I 10
CHAPTER II 21
CHAPTER III 26
TIC AND SPASM 26
TIC AND MOTOR REACTIONS; REFLEX, CO-ORDINATED, FUNCTIONAL, AUTOMATIC, AND VOLUNTARY ACTS 29
TIC AND CO-ORDINATION 31
THE GENESIS OF TIC 33
TIC AND WILL 37
TIC AND HABIT 38
TIC AND IDEA 40
TIC AND CONSCIOUSNESS 42
TIC AND POLYGON 43
TIC AND FUNCTION 45
CHAPTER IV 48
Конец ознакомительного фрагмента. 56

E. Feindel
Tics and Their Treatment

PREFACE

NOTHING could be less scientific than the establishment of a hierarchy among medical problems based on the relative severity of symptoms. Prognosis apart, there can be no division of diseases into major and minor.

Hitherto no great importance has been attached to those reputedly harmless "movements of the nerves" known as tics: an involuntary grimace, a peculiar cry, an unexpected gesture, may constitute the whole morbid entity, and scarcely invite passing attention, much less demand investigation. Yet it is the outcome of ignorance to relegate any symptom to a secondary place, for we forget that difficult questions are often elucidated by apparently trivial data. A fresh proof of the truth of this remark is to be found in the accompanying volume, to which MM. Meige and Feindel have devoted several years of observation.

To begin with, they must be congratulated on having done justice to the word *tic*. No doubt its origin is commonplace and its form unscientific, but its penetration into medical terminology is none the less instructive. If popular expression sometimes confounds where experts distinguish, in revenge it is frequently so apt that it forces itself into the vocabulary of the scientist. In the case under consideration Greek and Latin are at fault. The meaning of the word tic is so precise that a better adaptation of a name to an idea, or of an idea to a name, is scarcely conceivable, while the fact of its occurrence in so many languages points to a certain specificity in its definition.

Yet till within recent years tic had all but disappeared from the catalogue of diseases. A closer study of reflex acts, however, has led to the grouping together of various clonic convulsions of face or limbs, including "spasms" on the one hand, and, on the other, conditions of an entirely different nature, for which the term "tics" ought to be reserved. The separation of "tics" from "spasms," properly so called, has been the object of various experiments and observations made by the authors and by myself, the practical value of which is evidenced by their disclosure of efficacious therapeutic measures.

Among the confused varieties of spasm, clonus, hyperkinesis, etc., it is impossible not to recognise the obvious individuality of certain motor affections – certain movements of defence, of expression, of mimicry, certain gestures more or less co-ordinated for some imaginary end – all readily distinguishable from spasms, fibrillary contractions, and choreiform or athetotic movements. It is only logical to attribute a somewhat more complex origin to these varying gestures, in which the influence of the will, however unperceived in the end, is always to be detected at the beginning.

While some convulsions and spasms are the product of special changes in muscle fibre, or motor nerve, or spinal cord, in medulla, pons, or basal nuclei, the synergic and co-ordinated muscular contractions of tic imply cortical intervention. The will may not play a conscious role therein, but the cortex alone is capable of initiating such acts. What part does it take in their genesis?

For an instance, a simple blinking of the eyelids may form a tic. Considered in itself, it is a movement of defence against dust or light; but in the absence of irritation it becomes meaningless. How then are we to explain the abruptness and intensity of contraction of the orbicularis palpebrarum, and of this muscle alone? If it were due to stimulation at some point on the reflex facial arc, other facial muscles ought to be involved; if referable to isolated excitation of the orbicularis filaments of the facial nerve, why is the contraction bilateral? It is evident we are dealing here not with a simple reflex of bulbar origin, but with a movement at once premeditated and purposive, and it is this purposive element, presupposing, as it does, co-ordination of contraction, that indicates the cortical

nature of the phenomenon. Such co-ordinated movements, however causeless and inopportune they may appear, cannot be identified with mere pathological reflexes or spasms. They are tics.

Such, since the days of Trousseau and Charcot, has been the teaching of the Paris School of Medicine. Nevertheless, confusion remains, and in many text-books the unfortunate sacrifice of analytical accuracy to a premature desire for the schematic classification of disease has not tended to lessen it.

The authors of this volume have been resolute in their reference of the pathogeny of tic to a mental process. It is true, recognition of the psychological aspect of the affection is ready enough where the tic corresponds or is superadded to other "episodic stigmata of degeneration"; but the task is infinitely more delicate should the sole indication of an abnormal psychical state be the tic itself. Even in these cases examination always reveals insufficiency of inhibition, to which are due the inception and the persistence of many "bad habits." We can thus appreciate the rôle of habit in the evolution of tics, and recognise the analogy they offer to all functional acts. A tic is frequently nought else than the ill-timed and inapposite execution of some function. We may even conceive a sort of functional tic centre, formed by nerve elements corresponding to the functional grouping of the muscles involved in the tic. In advanced cases we may imagine some sort of hypertrophy of this functional centre, which may be reduced by suppression of function – that is to say, by certain methods of immobilisation.

This is the secret of the treatment of tics, and to ignore it would be disastrous. As a matter of fact, tic is not merely a neurosis, but a psycho-neurosis, or, to be more exact, a psychomotor encephalopathy. The degeneration whose first manifestation in a child is the development of a tic may reveal itself later by more disquieting signs. This word "degeneration" is employed either too indefinitely or too explicitly by those who are ignorant of its true meaning in medicine. To-day the physician's diagnosis is often anticipated by the parents, who are willing to own their child "nervous" because of his tic; but they are not so ready to admit he has a tic because he is nervous, as they would infer immediately that they have begotten a degenerate. The consolation of "superior degeneration" does not exclude a certain degree of humiliation.

No doubt superficial study is content to characterise children thus afflicted by the simple epithet "nervous," on the ground that their tic does not constitute a menace to life. But a tic in itself can never be a negligible quantity. The more it is repeated the more inveterate it becomes, and the greater the likelihood of its becoming generalised; at the same time the influence of the neuropathic diathesis is intensified. An analogy might be drawn between the tics and chorea. Prognosis, even in a mild case of adult chorea, should always be guarded, inasmuch as once the ordinary limits of the duration of the disease are over-stepped, we find ourselves face to face with the dreaded chronic variety.

The same attitude might be adopted in reference to the distressing neurosis described by Charcot and Gilles de la Tourette as the "disease of the tics," which is no more than the superlative expression of a neuropathic and psychopathic disposition entirely akin to that favouring the development of the most harmless tic. Its earliest exhibition is a series of apparently insignificant bizarre convulsions; but its indefinite prolongation, its gradual involvement of one limb after another, its association with grave mental symptoms, and its frequent termination in dementia, are reason enough for eyeing the first little premonitory tic with mistrust, and combating it with vigour.

From the motor aspect a tic is only a "bad habit," and the checking of bad habits, especially in the predisposed, must be our goal from the outset. And, should we succeed, there will be reason for congratulation, not on the happy issue of appropriate treatment for a particular tic, but because the result is a step towards *the habit of correcting bad habits*. Reinforcement of the will is the prime therapeutic indication, but the physician has no need to resort to mysterious subterfuges or occult practices; let him borrow the virtues of the successful teacher. The amelioration consequent on this procedure is seen not only in the recovery of lost aptitude for work, but also in the simultaneous restoration of self-confidence and will-power in patients who had appeared deprived of them for ever. The treatment of tic is evidence of its nature and curability. Since 1893 MM. Meige and Feindel have

subjected their cases to the educational discipline of systematised movement and of immobilisation. In contrast to the tendency of ordinary exercises to render certain useful acts automatic, this method aims at the suppression of automatic acts that have become useless. The development of the general principles of the method, as well as an exposition of recent modifications and their application to particular cases, will be found in the volume. Suffice it here to say that the results have been favourable enough to discountenance the prevalent idea of the incurability of tic, and to prove that persistence in treatment, as has been demonstrated in many other neuroses, will assuredly be crowned with success. Common misconception represents therapeutics as helpless in the presence of nervous disease; but if the doctor may count on the collaboration of his patient, he has no right to despair.

I should like, in closing, to be allowed to praise the authors' production; but I can do so only under great reserve, for after so many years of co-operation I can no longer distinguish the work of MM. Meige and Feindel from my own. I think, however, that from many points of view the book which they have written is a most useful one.

E. BRISSAUD.

AUTHORS' PREFACE

OUR object in publishing these studies has been twofold: first, to make known various facts of clinical observation, which will always possess at the least an intrinsic value; secondly, to endeavour to assign to the tics their due place among the numerous motor affections consequent on nervous or mental disease. With this end in view we sought to free ourselves of preconceived notions, avoiding at the same time the other extreme of eclecticism. Independently we have been led to adhere to the doctrine hallowed by the authority of Charcot, and since advocated by Professor Brissaud – a doctrine that seems to us to be in harmony with accepted clinical data.

We have thought it advisable to indicate, by the way, more than one misconception whose perpetuation is but a stumbling-block in the path of progress.

Since the eighteenth century the word *tic* has faced the perils of definition many a time, and has as often all but succumbed. The limits of its application have been alternately enlarged and narrowed to an excessive degree; its original signification has been so obscured that the inclination to-day is either to hesitate in the use of the word at all, or to employ it indiscriminately through ignorance of its real meaning. But if its interpretation be not specified, everything that is said or written on the subject will remain fatally open to dispute. Want of precision in words leads inevitably to confusion of ideas and endless misunderstanding. In this respect the word tic is a great culprit; its promiscuous use implies looseness in its connotation – a fruitful source of controversies which, when all is said and done, are nothing more than regrettable quid pro quos. On fundamental points there is almost complete unanimity of opinion; any divergence is purely superficial, and to be ascribed to disagreement in terms.

Hence it has seemed to us essential to adopt a vocabulary, and to employ any term only after clearly particularising the sense we attribute to it. Our verbal conventions will not meet with universal acceptance, it may be, but we shall be the first to abandon them if common consent assign to the expressions that replace them the exact shade of meaning we meant to convey.

Our work will not be superfluous if we succeed in allotting to the word a definite position in medical terminology, or if any information we have amassed prove of service to future observers. And should we be enabled to demonstrate how unmerited is the reputation the tics enjoy of being irremediable, how they may, on the contrary, be mitigated and sometimes even cured under appropriate treatment, the practical value of the conclusion will, we hope, justify the importance we have attached to the subject.

NOTE BY THE TRANSLATOR

OWING to the kind co-operation of M. Meige, it has been possible to embody in this English version of *Les tics et leur traitement* his latest definitions and views, as expressed in his monograph *Les tics* (July, 1905). The passages thus derived are enclosed in brackets. In the making of the translation some of the clinical cases have been slightly abridged, and one or two omitted. The Bibliography has been revised, largely supplemented, and brought up to date. In a short Appendix reference is made to various matters in regard to tic on which discussion has recently centred, subsequent to the publication of Meige and Feindel's book. Indices of names and of subjects have been added.

CHAPTER I
THE CONFESSIONS OF A VICTIM TO TIC

AT the time when the plan of our book was being sketched we decided to introduce the subject with several characteristic clinical documents, since it appeared to us indispensable to preface our definitions with an illustration of the type of affection and of patient that we had in view. The choice was rather bewildering at first; but towards the close of 1901 one of us was put into communication with an individual who is a perfect compendium of almost all the varieties of tic, and whose story, remarkable alike for its lucidity and its educative value, forms the most natural prelude to our study. The history is neither a fable nor an allegory, but an authenticated and impartial clinical picture, whose worth is enhanced by no less genuine facts of self-observation.

O. may be said to constitute the prototype of the sufferer from tic, for his grandfather, brother, and daughter have all been affected, and he himself has not escaped. His grandmother and grandfather were first cousins, and the latter, in addition to being a stammerer, developed tics of face and head; his brother stammers too, while both his sister and his daughter have facial tics, and one of his sons was afflicted with asthma as a youth. The family history therefore more than confirms the existence of a grave neuropathic heredity, an unfailing feature in cases of tic.

O.'s fifty-four years lie lightly on him. His physique and general health are excellent, and devotion to bodily exercise and outdoor sports has enabled him to maintain a vigour and an agility above the average; nor is his intellectual activity any less keen.

His earliest tics – simple facial grimaces and movements of the head – made their appearance when he was eleven years old; notwithstanding, his recollection of their mode of onset is very exact.

I have always been conscious of a predilection for imitation. A curious gesture or bizarre attitude affected by any one was the immediate signal for an attempt on my part at its reproduction, and is still. Similarly with words or phrases, pronunciation or intonation, I was quick to mimic any peculiarity.

When I was thirteen years old I remember seeing a man with a droll grimace of eyes and mouth, and from that moment I gave myself no respite until I could imitate it accurately. The rehearsals were not prolonged, as a matter of fact, and the upshot was that for several months I kept repeating the old gentleman's grimace involuntarily. I had, in short, begun to tic.

In my fifteenth year I was at school with two boys whose hair was rather long, and who had acquired the habit of tossing it back by an abrupt shake of the head. It is true I cannot recollect endeavouring to ape this, but in any case it was at the same time that I found myself exhibiting an identical gesture, and I have little doubt it is the source of one of the tics from which I suffer at present.

I enlisted at the commencement of hostilities in 1870, and had already begun my military instruction, when a personal review of the company was made by a new colonel. As he passed he came to a sudden halt before me, and proceeded to harangue me on my far from military bearing; but his invective had no other effect than to aggravate my facial contortions, and the affair might have proved serious enough for me had not my captain come to the rescue and explained the involuntary nature of the spasms. The colonel, however, would have none of them and after a fortnight's sojourn in hospital I was discharged for "choreic movements of the face."

O.'s tics were at the first confined to the eyes and lips, but others were not long in appearing. He happened to be out one day for a walk with his sister during a snowstorm, and a flake entering his nostril made him sneeze and sniff half a dozen times. Long after the snow had ceased falling and the tickling sensation had vanished he repeated the performance, till it passed into a sniffing tic that continued for some months. His sister thoughtlessly set herself to mimic him, and speedily evolved an identical tic, which still persists.

In their turn, neck and shoulders were implicated in the affection. The most inveterate of all his tics is a somewhat complex twist of the head, whereby the occiput is depressed jerkily, and the chin advanced and elevated, occasionally to the right, though more commonly to the left. Such is the clonic form of the tic, at once frequent and obvious; but it may assume a tonic form, distinguished by an almost permanent retrocollic displacement of the head, the chin being carried in the air.

If, now, we approach these tics in greater detail, we notice, first of all, a blinking tic, more marked on the left side. Apart from abrupt and intermittent contractions of the orbicularis, which close the eye completely and wrinkle the skin in the neighbourhood, the same muscle sometimes passes into a state of tonic contraction, whereby the eye remains only half open, while the rest of the face is in repose, and so continues for a minute or more. Frontal and eyebrow tics also are frequently to be remarked.

Of his own accord O. has supplied us with a pathogenic and etiological analysis of these tics, which for accuracy and insight is truly astonishing.

A large number of my head and face movements owe their origin to the annoyance caused me by my seeing the tip of my nose or of my moustache from time to time. The former organ appears to make a sort of screen in front of me, to avoid which I turn or raise my head: I can now see the object I am facing, but at the same time, naturally, I see my nose again at the side, whence one more tilt of the head, and so on. I am well enough aware how nonsensical all this is; but it fails to deter me from my desire of playing at hide-and-seek with my nose. It is for an identical reason that each moment finds me blinking one eye or the other, or both; I wish, and yet I do not wish, to see my nose, and so I bring my hand up to cover my face. Vain delusion! for if I conceal my nose thus, it is my hand I see next, and I escape from Scylla to fall into Charybdis!

Here, then, is a tic springing from an ordinary visual impression. Any one can see the point of his nose if he wishes, but it does not come in his way should he be looking at something else; whereas our patient divides his attention between the end of his nose and the object of his regard, and his volatile will passes lightly from one to the other, incapable of concentrating itself on either. Force of repetition changes the voluntary act into an automatic habit, the initial motive for which is soon lost; and the patient shows the weakness of his character by making little or no effort at inhibition.

Resort to a pince-nez, in view of advancing age, has contributed materially to the elaboration of a host of absurd jerky movements, from which more tics have been recruited.

No sooner have I put on my pince-nez than I long to alter its position in innumerable ways. I must needs push it down or raise it up, must set it farther on or farther off; sometimes I tax my ingenuity in attempts to displace it by tossing my head. Instead of looking tranquilly through the glasses, my eye is continually attracted by the rim, some point on which I try to focus or to get into a line with the object at which I am gazing. I want to see the object and the pince-nez at the same time; as soon as I no longer see the former I wish to see it again, and similarly with the latter. My tics upset my pince-nez, and I have to invent another tic to get it back into place. The absurdity of this vicious circle does not escape my observation, and I know I am its author, yet that cannot prevent my becoming its victim.

When the pince-nez is not in use I toy with the spring or with the cord, and a day seldom passes without my breaking the one or the other. As I wear spectacles at home one might suppose their relative stability would check my tricks; but their pressure on my temples and ears only serves to provoke fresh movements in a search for comfort.

And so the thing goes on. I was perfectly well aware of it at first, and was wont to imagine it was remediable; eventually, however, these grimaces of mine took place without any attention on my part, and then in spite of it, and I was no longer their master. There seem to be two persons in me: the one that tics, the son of the one that does not, is an *enfant terrible*, a source of great anxiety to his parent, who becomes a slave to his caprices. I am at once the actor and the spectator; and the worst of it is, the exuberance of the one is not to be thwarted by the just recriminations of the other.

In his accidental discovery of a "crack" in his neck originated other tics. As a matter of fact, these "cracks" do exist, and can be heard at a little distance; but it always requires a brisk toss of the head to elicit them. This is O.'s account of their evolution:

One day as I was moving my head about I felt a "crack" in my neck, and forthwith concluded I had dislocated something. It was my concern, thereafter, to twist my head in a thousand different ways, and with ever-increasing violence, until at length the rediscovery of the sensation afforded me a genuine sense of satisfaction, speedily clouded by the fear of having done myself some harm. The painlessness of the "crack" induced me to go through the same performance many and many a time, and on each occasion my feeling of contentment was tinged with regret: even to-day, notwithstanding that I ought to be persuaded of the harmlessness of the occurrence and the inanity of the manœuvre, I cannot withstand the allurement or banish the sentiment of unrest.

One could not desire a more lucid exposition of the pathogeny of so many of these head-tossing tics. The fundamental importance of the psychical element that precedes the motor reaction, with the secondary psychical reaction in its turn, the impulse to seek a familiar sensation, and the illogical interpretation of it under the influence of a tendency to nosophobia, are all admirably illustrated in O.'s description.

In addition to such "cracks" as are perceptible to others, O. is conscious of various bizarre subjective sensations that he refers to the same region – "bruised," "dragging," "crackling" feelings, not at all dolorous, to which he devotes an inordinate share of his attention. There is nothing abnormal about these, of course; not only may we notice them in ourselves, but, with a little effort, we may even reproduce them. Our indifference to their presence is the exact opposite of the interest they arouse in the patient's mind; his fickle will is, for no adequate motive, concentrated on a commonplace event, and on this slender basis delusions are fostered and tics are shaped.

The insight into the close association between the state of the mind and the development of tic yielded by a study of the foregoing narrative will enable us to appreciate the perspicacity of what follows:

I suppose that we who tic make a great number of voluntary movements with the deliberate purpose of withdrawing attention from the tics we already exhibit; but step by step they become so habitual that they are nothing less than fresh tics appended to the old. To dissemble one tic we fashion another.

Certain objects become for us what might be called *para-tics*. Such, for an instance, is my hat. I used to imagine I could mask all my oddities by tilting it on my head. I used to carry it in my hand, and play with it in every conceivable manner – to the advantage of the hatter solely, for it did not last me more than six weeks… We are our own physicians at first: the discomfort of a tic is an urgent reason for our seeking to compass its overthrow.

For years it was O.'s custom when out walking to clasp his hands behind his back, bend his body forward, and hold his chin in the air, and this habit explains his attitude tic of to-day. The ludicrousness of it was early impressed on him, but instead of adopting the obvious solution of the difficulty, he proceeded to devise a whole series of intricate measures to regain the correct position – measures which he picturesquely names *para-tics*. At first he used the curved handle of his cane to pull on the brim of his hat, and so depress his head; a subsequent modification consisted in putting the cane under his chin and pressing down on it. Each of these subterfuges attained a degree of success, and that in spite of the fact that in one case the extensors, and in the other the flexors, of the head were being resisted: in other words, each was efficacious so long as O. chose to consider it so.

Eventually their serviceableness dwindled, and O. conceived the plan of slipping his cane between his jacket and his buttoned overcoat so that the chin might find support against its knob. In the movements of walking, however, contact between the two was never maintained – each was for ever seeking the whereabouts of the other; and while it mattered little that this incessant groping and jockeying wore out several suits and the lining of several overcoats, the more serious result was the

acquisition on O.'s part of the habit of making various up-and-down and side-to-side movements of his head, which continued to assert themselves, though chin and cane were no more in proximity.

It was not long ere the ceaseless intrusion of his head tics drove him every moment in search of a support for his chin. To read or write he was forced to rest it on a finger, or on his fist, or hold it between two fingers, or with his open hand, or with two hands, although the distraction provided by a serious occupation sufficed to banish the impulse and stay the tics.

A day came when application of the hand no longer seemed calculated to ensure immobility of the head, whereupon he hit on the idea of sitting astride a chair and propping his chin against it. This idea had its day, and the next move was to press his nose against one end of the chair back. Each successive stratagem was of marvellous promise at the outset, but its inhibitory value rapidly deteriorated and new plans were concocted.

All schemes for fixation lose their virtue through time, but they may be abandoned for other reasons, one of the principal of which is the development of pain. By dint of rubbing or pressing his nose or his chin on the knob of his cane and the back of his chair, O. has produced little excoriations and sores on the parts concerned, the pain of which acts as a deterrent, but his tics and para-tics break out afresh whenever it has gone. The game has been carried to such an extent that under the chin and at the root of the nose there have appeared actual corns – strange stigmata of one's "profession."

The details in the mental process are similar to what has been already noted:

It was the craving to keep my head in a correct position that induced the habit of leaning my chin on something, and I found it essential to feel the contact; familiarity, however, soon ended in my failing to perceive it, and a new movement was made that I might experience the sensation once more. And so on the ball rolled, till augmentation of the force I exerted, under a constant incitement to feel something more or something else, resulted in the formation of callosities on nose and chin.

In this way factitious wants come into being, which may be described as a sort of *parasitic function* of which the patient is alike the creator and the dupe.

O.'s therapeutic ingenuity, however, could not rest satisfied except when some fresh contrivance was being put to the test. Needless to say, at one time he experimented with the stiff collars affected by some sufferers from mental torticollis.

At the commencement I used to wear collars of medium height, though not wide enough to admit my chin. An attempt to obviate the difficulty by unbuttoning my shirt and bending my head down so as to keep my chin in the opening proved abortive, owing to the weakness of the resistance, so I purchased much higher and suffer ones, in which I buried my lower jaw and prevented its moving at all. The success of this method was transitory, nevertheless, for however stiffly they were starched, the collars invariably yielded in the end and presented a lamentable aspect. I next happened on the fatuous plan of attaching a string to my brace buttons, and passing it up under my waistcoat to connect it with a little ivory plate that I held between my teeth, its length being so arranged that in order to seize the plate I had to lower my head. Admirable idea! I soon was forced to abandon it, however, for my trousers were pulled up on the right in a way that was as grotesque as it was uncomfortable. I have always had a weakness for the principle of the thing, nevertheless, and even to-day as I go down the street I sometimes catch hold of the collar of my jacket or vest with my teeth and stroll along in this way. At home it is the collar of my shirt that acts as my tether.

The retrocollic attitude that O. favours seems to have had the further effect of making him forget how to look down. There is no impairment of any of the eye movements, but he has considerable trouble in directing his gaze downwards, and if with his head in the normal position he holds a book below the level of the plane of his eyes, reading is more arduous, and after a little time impossible. Yet there is no indication whatever of ocular paresis; it is rather a sort of apprehension from which he suffers. On several occasions we have remarked a synergy of function, head and eyes moving upward in unison.

Our patient's category of tics is not yet exhausted, however. He has been afflicted with a shoulder tic, consisting of simultaneous or alternate elevation, sometimes of other movements, and always with some abduction of the arms. Frequent execution of these actions has culminated in the acquisition of the faculty of voluntarily producing a rather loud "crack" in the shoulder articulations, which thus not merely originated in a tic, but supplies an ever-active stimulus for its reproduction; in its occurrence satisfaction and dissatisfaction are blended as before. At the present moment the impulse to this particular tic is in abeyance, and he has ceased to take any interest in the "crack," considering it a trivial society accomplishment of no significance or danger, analogous to voluntary subluxation of the thumb, or to the curious sounds that some people are fond of making by way of diversion.

Again, O. has been a martyr to a leg tic of several months' duration. When he was on his feet, he learned to strike his right heel against his left ankle, wearing his trouser through in no time, and ceasing only with the development of a painful wound over the bone. Once it was healed, however, came the deliberate search for the sensation again, and the pleasurable feeling in its rediscovery.

In O.'s case the inhibitory influence of the will on his tics is abundantly manifest. Should he find himself in the company of one from whom he would fain conceal his tics, he is able to repress them completely for an hour or two, and similarly if he is deep in an interesting or serious conversation. Nevertheless, the desire to let himself go obtrudes itself again, and if he can refrain no longer he will invent any pretext for leaving the room, abandoning himself in his moment of solitude to a veritable debauch of absurd gesticulations, a wild muscular carnival, from which he returns comforted, to resume sedately the thread of the interrupted dialogue.

O. is fond of cycling, and while at first the attention that the necessary co-ordination of hands and feet demanded proved an effective barrier in the way of his tics, now that he can maintain his equilibrium automatically his head assumes its favourite attitude of posterior displacement. His devotion to a game of billiards, or to such exercises as fencing or rowing, is never interfered with by an unruly tic. He is a great fisher, and when he "has a bite," or is expecting one, he will remain motionless indefinitely; his tics do not hinder him from preparing his bait with the minutest care. But let his interest in his prospective catch fade, let the fish be disinclined to "take," and there will be a renewal of the movements.

In his sleep they one and all disappear. The mere assumption of a horizontal position, however, no longer suffices to bridle them, and before dropping off to sleep he passes many a minute in seeking comfort. The rubbing of his head on the pillow, the rustling of the clothes, disturb and exasperate him, and he turns in this direction and that for relief; yet should he hear or feel nothing, he will change about once more in the search for a sensation or a sound. Thus has it come about that to procure slumber he has adopted the extraordinary plan of lying at the very edge of the bed and letting his head hang over.

The series is not yet at an end.

O. exhibits a tic of the inferior maxilla. He protrudes and retracts his jaw alternately in his endeavour to elicit cracking noises from his temporo-maxillary articulations. At one time his hands used to join in the fray, the goal being to overcome the masseters and effect a sort of dislocation. A biting tic ensued. One day O. was alarmed to discover two dark patches on the internal aspect of the cheeks, but was reassured on learning from his sister – whose proclivities lay in a similar direction – that she had noticed the same in her own case, and that it was the result of constant nibbling at the buccal mucous membrane.

Nor was this the solitary biting tic. Formerly a pencil or a pen-holder used to be unrecognisable at the end of twenty-four hours, and the handles of canes and umbrellas suffered as well. To obviate the nuisance he entertained the unfortunate idea of using metal pen-holders and carrying silver-mounted walking-sticks; but his teeth failed to make any impression on the objects, and began to break in consequence. The irritation produced by a small dental abscess proved an additional source

of mischief, for he developed the habit of trying, with finger, cane, or pen-holder, to shake the teeth in their sockets, and was finally compelled to have the incisors, canines, and first molars drawn. Then he ordered a set of false teeth – a move that afforded a new excuse for a tic. Every moment the set was in imminent risk of being swallowed, so vigorously did his tongue and lips assail it. Fortunately such an accident has never occurred, although he has already broken several sets. Sometimes he would be seized with an insane impulse to take his teeth out, and would invent the flimsiest pretext for retiring; the set would then be extracted and immediately reinserted, to his complete satisfaction and peace of mind.

An infinite variety of scratching tics must be added to the number. He has also a tic of phonation dating back to his fifteenth year. His custom was, when learning his lessons at school, to punctuate his recital of them with little soft expiratory noises that may still be distinguished to-day among a host of other tics. The following is his proffered explanation of the pathogeny of this "clucking" tic:

We who tic are consumed with a desire for the forbidden fruit. It is when we are required to keep quiet that we are tempted to restlessness; it is when silence is compulsory that we feel we must talk. Now, when one is learning his lessons, conversation is prohibited, the natural consequence being that he seeks to evade the galling interdict by giving vent to some inarticulate sound. In this fashion did my "cluck" come into being. Moreover, we abhor a vacuum, and fill it as we may. Various are the artifices we might employ – such, for instance, as speaking aloud; but that is much too obvious, and does not satisfy: to make a little grunt or cluck, on the other hand – what a comfort in a tic like that!

We need not smile at these explanations, for they are corroborated by the facts of clinical observation. Fear of silence is nothing else than a form of phobia, comparable to the fear of open spaces.

O.'s account of the origin of his tics supplies further evidence of the mental infantilism of those with whom we are at present concerned. It is the prerogative of "spoilt children" to wish to do exactly what they are forbidden to do. They seem to be animated by a spirit of contrariness and of resistance; and if in normal individuals reason and reflection prevail with the approach of maturity, in these "big babies" many traces of childhood persist, in spite of the march of years.

In the strict sense of the words there never has been any echolalia or coprolalia in O.'s case, though it has happened that expressions lacking in refinement have escaped him; but he never has been consciously yet irresistibly urged to utter a gross word. The sole vestige of anything of the kind is a sort of *fruste* coprolalia that consists in an impulse to use slang – an impulse which he cannot withstand and which he finds consolation in obeying.

Some additional details may be submitted to illustrate the intimate analogies between tics and obsessions.

O. is a great cigarette smoker, and with him the call to smoke is inexorable. It is not so much, however, the effects of the narcotic for which he seeks as the sum of the sensations derived from the act – the rustling of the tobacco in the paper, the crackle of the match, the sight of the cloud of smoke, the fragrance of it, the tickling of nose and throat, the touch of the cigarette in the fingers, or between the lips – in a word, a whole series of stimuli, visual, auditory, olfactory, and tactile, whose habitual repetition gradually introduces into the act of smoking an automatic element that brings it into line with the tics. The suppression of this parasitic function commonly produces a feeling of the utmost discomfort; inability to indulge in it causes the keenest anguish. More agonising than the actual impossibility of smoking is the idea of its being impossible. Hence it is that O. lights cigarette after cigarette, taking a few whiffs at each and throwing them aside scarce touched, or leaving them here, there, and everywhere. The dose is immaterial; it is the rehearsal of the act he finds so soothing.

In regard to his taste for liquor a similar description might be given. The intoxicating effect of any beverage had little attraction for him; it was the drinker's gesture and the numerous accompanying sensations that he sought to renew. Any form of drink, therefore, served to gratify his desire; in other words, his behaviour revealed a phase of dipsomania rather than a stage of alcoholism. For

that matter, the development of symptoms of alcoholic poisoning proved a blessing in disguise, since they reinforced the inhibitory power of the will, and enabled it to abort a sensori-motor habit that had wellnigh become established.

No objective alteration in cutaneous sensibility in any of its forms is discoverable on examination of O., but he bewails a long array of subjective sensations, painful or disagreeable as the case may be. Certain abdominal pains in particular occupy his thoughts: after being in bed about an hour he begins to suffer from pain in the abdomen and across the kidneys, so acute that he is forced to rise and walk about his room, or sit on one chair after another; at length it moderates enough to allow return to bed and permit of sleep. During these crises there is no sign of any local pathological condition, no distention or tenderness or evacuation of the bowel. They usually last for some days at a time and disappear suddenly, as when, after several nights' and days' uninterrupted suffering, his pains vanished as by an enchanter's wand once he set foot on the boat that was to take him to England.

We have had the opportunity of observing our patient in the throes of one of these attacks, and while we did not doubt the genuineness of his sufferings, we could not but be struck with the dramatic exuberance of his gestures. He wriggled on his chair, unbuttoned his clothes, undid his necktie and his collar, pressed his abdomen with his hands, sobbed and sighed and pretended to swoon away. Such excessive reaction to pain is characteristic of a nervous and badly trained child, not of a man of his years. Notwithstanding his humiliation at these exhibitions of weakness, he can no more control them than he can his ordinary tics; in fact, the tics run riot during the crises of pain.

On several occasions the reflexes have been the object of examination. The pupillary reactions are normal, as are the tendon reflexes of the upper extremity; but the knee jerks are much diminished, and one day we failed to elicit them at all, though we noted their return a week later. A careful search for further signs of possible cerebro-spinal mischief proved negative, if we except a slight flexion of the knees when walking and a tendency to a shuffling gait.

Notwithstanding this absence, in O.'s case, of any definite indication of organic disease, we cannot afford, in our examination of patients, to overlook any symptom, however fleeting or trivial it may appear, since it is only by painstaking investigation both on the physical and the mental side that we can ever hope to determine the characters and fathom the nature of the affection, apart from the value of such an investigation as an aid to diagnosis, prognosis, and treatment.

With charming spontaneity and frankness, but critically withal, O. has furnished us with a picture of his mental state. Nothing could be truer or more instructive than this piece of self-observation, even though his obvious pleasure in hearing himself talk is a little weakness of which, to tell the truth, he is the first to accuse himself:

In childhood and at school my accomplishments were ever on the same dead level of mediocrity. I was neither brilliant nor backward; in the drawing-room or in the playground, I was good at everything without excelling in anything; the astonishing facility with which I learned to sing, play, draw, and paint, was linked with inability to distinguish myself at these pursuits.

Each new study, each new game, attract and captivate me at first, but I soon tire of them, and once a fresh enterprise has taken their place, indifference to them changes to disgust. If I am amused with a thing, I do it well; if bored, I throw it aside. I suppose it is characteristic of people who tic to be fickle and vacillating.

The versatility which is so fundamental an element in O.'s nature has not been prejudicial to his business career. He has managed and still manages important commercial undertakings, demanding initiative and decision, and, so far from sparing himself in any way, he has exhibited a combination of caution and audacity that has stood him in good stead. It is more especially in the conduct of urgent operations that his alertness is displayed. His comprehensive grasp of the situation enables him to put his machinery at once into action, with eminently satisfactory results, if we judge by his prosperous and assured position.

His mobile and impulsive temperament is revealed in his every deed, but he shows at the same time a curious disposition to alternate between the pros and the cons of a question. It is the outcome of his extremely analytical and introspective mind.

I find myself seeking a knot in every bulrush. I experience a sensation of pleasure only to tax my ingenuity in discovering some danger or blame therein. If a person produces an agreeable impression on me, I cudgel my brains in the attempt to detect faults in him. I take it into my head to ascertain how anything from which I derive enjoyment might become an aversion instead. The absurdity of these inconsistencies is perfectly patent to me, and my reflections occasion me pain; but the attainment of my ends is accompanied with a feeling of pleasure.

In regard to my tics, what I find most insupportable is the thought that I am making myself ridiculous and that every one is laughing at me. I seem to notice in each person I pass in the street a curious look of scorn or of pity that is either humiliating or irritating. No doubt my statement is a little exaggerated, but my fellows and I have an overweening self-conceit. We wish to be ignored, and yet we wish to be considered; it is annoying to be the object of sympathy, but we cannot bear to become a laughing-stock. Accordingly our goal is the dissimulation of our failing by any means feasible; yet nine times out of ten our efforts are abortive simply because we invent a tic to hide a tic, and so add both to the ridicule and the disease.

Alike in speaking and in writing O. betrays an advanced degree of mental instability. His conversation is a tissue of disconnected thoughts and uncompleted sentences; he interrupts himself to diverge at a tangent on a new train of ideas – a method of procedure not without its charm, as it frequently results in picturesque and amusing associations. No sooner has he expressed one idea in words than another rises in his mind, a third, a fourth, each of which must be suitably clothed; but as time fails for this purpose, the consequence is a series of obscure ellipses which are often captivating by their very unexpectedness.

His writing presents an analogous characteristic.

It has often happened that I have commenced a business letter in the usual formal way, gradually to lose sight of its object in a crowd of superfluous details. Worse still, if the matter in hand be delicate or wearisome, my impatience is not slow to assert itself by remarks and reproaches so pointed and violent that my only course on reperusal of the letter is to tear it up.

By way of precaution, therefore, O. has adopted the plan of having all his correspondence re-read by his colleague. Strangely enough, to his actual caligraphy no exception can be taken. The firmness of the characters, the accuracy of the punctuation and accentuation, the straightness of the lines, are as good as in any commercial handwriting.

With the aggravation of his head tics writing has become a serious affair. Every conceivable attitude has been essayed in turn, and at present the device he favours is to sit across a chair and rest his chin or his nose on the back; in this fashion he can write all that is required.

O.'s every act is characterised by extreme impatience. In his hurry he comes into collision with surrounding objects or breaks what he is carrying in his hand, not because of defective vision or incoordination of movement, but because of his eagerness to be done.

In spite of the fact that I know my recklessness to be absurd, that I see well enough the obstacles around and the danger of an encounter, I am conscious of a paradoxical impulse to do exactly what I should not do. In the same instant of time I want what I do not want. As I pass through a door I knock against the door-post without fail, for the sole reason that I would avoid it.

There is impatience in his speech. His volubility makes him out short his own phrases or break in upon the conversation of others. If an idea suggests itself, he must give it expression. Perhaps the word wedded to the idea is not at once forthcoming, yet he does not hesitate to invent a neologism, which is often amusing in spite of or because of its oddness, and if it please him he will enter it in his vocabulary and use it in preference to the other.

To wait is foreign to his nature. The least delay at table exasperates him; any order he gives must be executed instanter; no sooner has he set out than he would be at his journey's end. An obstruction or difficulty in the way is the signal for a fresh outburst; his irritation soon exceeds all bounds; his language degenerates into brutality, his gestures become increasingly violent and menacing.

It is not with any surprise, then, that we learn in O.'s case of incipient homicidal and suicidal ideas.

At times when my tics were in full force evil thoughts have often surged over me, and on two or three occasions I have picked up a revolver, but reason fortunately has come to the rescue.

As a matter of fact, the suicidal tendencies of some sufferers from tic are seldom full-blown. The will is too unstable to effect their realisation. Hence the patient's hints at doing away with himself are nothing more than empty verbiage. Similarly with the inclination to commit homicide, it vanishes as soon as it arises.

The term "vertigos" is used by O. to designate a long series of little "manias" or obsessional fears from which he suffers, among which may be enumerated dread of passing along certain streets and a consequent impulse to walk through others; dread of breaking any fragile object he holds in his hands, coupled with the temptation to let it fall; fear of heights, and at the same time a desire to throw himself into space.

I have often stood on the edge of the pavement waiting for a vehicle to pass, and at the moment of its approach darted across just under the horse's nose. On each occasion I have been conscious equally of the absurdity and yet of the irresistibility of the idea; each time the attempt to withstand it has been labour lost.

O. is a great nosophobe. At one time he was immoderately apprehensive of contracting hydrophobia, and used to flee from the first dog he saw. To his sincere regret he had several of his pet dogs killed, because of his conviction that they would become infected, although he felt such harsh measures to be quite unjustifiable. At a subsequent stage he turned syphilophobe for no adequate reason. He was alarmed lest a minute pimple on his chin should develop into a chancre. Recently his chief misgiving has been that he may become ataxic or demented.

Among his various afflictions mention must be made of an umbilical hernia, supposed to have originated in the chafing of his umbilicus by a belt he was wearing during a long spell in a canoe. As a matter of fact, the hernia is purely imaginary – at any rate, there is no trace of it to-day. Yet at the first it bulked very largely in his mind, and he is still fully persuaded of its reality, though no longer of its gravity.

O. further complains of all sorts of noises in his ears, but these are simply the ordinary sounds that one can produce in the middle ear by clenching the jaws together. He will not accept so obvious an explanation, however, preferring to regard them as indubitable evidence of the "lesion" with which he is preoccupied. The tinnitus, therefore, is rather of the nature of an illusion than of a hallucination.

He is distinctly emotional, and lives at the mercy of his emotions, but from their very bitterness he contrives to derive some pleasure. His passion for horse-racing is not due to the fascination of the sport, but to a bitter-sweet sensation which the excitement of the scene calls into being. He is indifferent to arrest or aggravation of his tics; all that he seeks is the association of a certain sense of anguish with certain "tremolos in the limbs," wherewith he is greatly delighted.

In the domain of his affections there does not appear to be any abnormality. O. is an excellent paterfamilias, adoring his children, but spoiling them badly at the same time. In this part of our examination we did not press for details, but as far as we have gathered he is capable of sympathies keenly felt though rarely sustained.

Thus, whatever be the circumstances, changeableness, versatility, want of balance, are manifested clearly in all his mental operations; and when he remarks himself on the youthfulness of his disposition, he is simply stating a truism as far as those who tic are concerned, for, in spite of the advance of years, their mental condition is one of infantilism.

Under our direction O. has devoted several months to the eradication of his tics, and he has not been slow to appreciate the aim of the method or to acquire its technique. One of the first results was the repudiation of various procedures more harmful than otherwise, and the successful endeavour to maintain absolute immobility for an increasing space of time. The outcome of it all has been a gradual diminution of the tics in number, frequency, and violence, and a corresponding physical and mental amelioration.

We do not intend in this place to enlarge on the details of our treatment: suffice it to say that it consisted in a combination of Brissaud's "movements of immobilisation" and "immobilisation of movements" with Pitres's respiratory exercises and the mirror drill advocated by one of us. To-day the utility of these measures is an accepted fact; but at the same time we rely on an inseparable adjunct in the shape of mental therapeusis, seeking to make the patient understand the rationale of the discipline imposed.

Our task has been lightened to an unusual degree through O.'s intimate acquaintance with the beginnings of his tics and his striking faculty of assimilation. On many occasions he has anticipated our intentions and of his own accord outlined a programme in harmony with the indications we were about to give him. Thanks to this happy combination of circumstances, the improvement effected by our treatment has been quickly manifested.

I am conscious of very material gain. I do not tic so often or with such force. I know how to keep still. Above all, I have learned the secret of inhibition. Absurd gestures that I once thought irrepressible have succumbed to the power of application; I have dispensed with my para-tic cane; the callosities on my chin and nose have vanished; and I can walk without carrying my head in the air. This advance has not been made without a struggle, without moments of discouragement; but I have emerged victorious, strong in my knowledge of the resources of my will… To tell the truth, at my age I can scarcely hope for an absolute cure. Were I only fifteen, such would be my ambition; but as I am, so shall I remain. I very much doubt whether I shall ever have the necessary perseverance to master all my tics, and I am too prone to imagine fresh ones; yet the thought no longer alarms me. Experience has shown the possibilities of control, and my tics have lost their terror. Thus have disappeared half my troubles.

The same sagacity that O. displayed in analysis of his tics has enabled him to grasp the principles of their subjugation. Notwithstanding that his guarded prognosis is evidence for his appreciation of the hindrance his peculiar mental constitution is to a complete cure, he has impartially put on record his definite progress towards health of body and mind.

Such, then, is the faithfully reported story of our model, such are his confessions.

During ten years' intercourse with sufferers from tic it has been our interest to analyse and reconstruct the pathogenic mechanism of their symptoms, and in the vast majority of cases it has been possible to determine the origin of the tics and to confirm the association with them of a peculiar mental state. We have thus been able to supplement earlier and weighty contributions to the subject by numerous suggestive instances, prominent among which is the case of O., whose spontaneous and impartial self-examination forms an invaluable clinical document. Its importance is enhanced by the fact that its observations are corroborated by a survey of other examples of the disease.

With commendable good-humour, keenness, and sincerity, O. has of his own accord plunged into the minutiæ of his malady, and exhibited a rare appreciation and precision in the scrutiny of his symptoms. The mere enumeration of them stamps the record as one of outstanding clinical importance, but it is the study of their pathogeny that is so fascinating. For a moment the doubt crossed our mind that O.'s explanations might be merely a reflex of information culled from scientific journals or of conversations with medical friends, but this is not so. He has been prevented by his profession both from cultivating a taste for and from devoting any leisure to psychological and physiological questions, while he evinces an actual antipathy to medical literature, fearful as he is of contracting disease. The point we are desirous of emphasising, therefore, is simply this: that the results of O.'s

voluntary and unprejudiced self-examination are in perfect harmony with the declarations of our older patients and with the statements of the majority of those that have made a special study of the tics. For these reasons we have taken O. as the prototype of the *tiqueur*.

CHAPTER II
HISTORICAL

WE have just become acquainted with an individual who may, we believe, be considered the type of a species, and have described all his tics. What is a tic, then?

Its etymology has not much information to furnish. The probability is that the word was originally onomatopœic, and conveyed the idea of repetition, as in tick-tack. *Zucken*, *ziehen*, *zugen*, *tucken*, *ticken*, *tick*, in the dialects of German, *tug*, *tick*, in English, *ticchio* in Italian, *tico* in Spanish, are all derivatives of the same root. It matters little, in fact, since the term is in general use and acceptable for its shortness and convenience. In popular language every one knows what is meant by a tic: it is a meaningless movement of face or limbs, "an habitual and unpleasant gesture," as the Encyclopædias used to say. But the definition lacks precision.

A glance at the history of the word will reveal through what vicissitudes it has passed. We need but remind the reader of its exhaustive treatment in the Dictionaries, and refer him for an elaborate bibliography to a recent work by R. Cruchet,[1] to which we shall have occasion to return.

There is no justification for regarding the risus *sardonicus* of the ancients as a tic. All that we can say is that the phrase apparently stood for a complex of facial "nervous movements," whether accompanied by pains and paralyses or not. Nor can the *rictus caninus* or the *tortura oris* have been other than spasms or oontractures of the face.

Previous to its introduction as a technical term, the word *tique*, *ticq*, *tic*, was in current use in France, and applied in the first place to animals. In 1655 Jean Jourdin described the *tique* of horses. In eighteenth-century literature tic appears in the sense of a "recurring, distasteful act" – as expressed by the *Encyclopædia*– especially in individuals revealing certain eccentricities of mind or character. This old-time opinion is worth remembering, particularly in view of latter-day theories.

Once adopted by the eighteenth-century physicians, the application of the word was extended in various directions. André (1756) was the first to mention *tic douloureux* of the face, an affection excluded to-day by common consent from the category of true tics. Simple, painless convulsive tic, spreading from face to arms, and to the body as a whole, was differentiated by Pujol in 1785-7. During the earlier half of the nineteenth century no solid progress was achieved by the work of Graves, François (of Louvain), Romberg, Niemeyer, Valleix, or Axenfeld. It is to the clinical genius of Trousseau that we owe the rediscovery of tic, the careful observation of its objective manifestations, and the recognition of accompanying mental peculiarities.

In spite of the fact that he considered it a sort of incomplete chorea, and classed it[2] nosologically with saltatory and rotatory choreas and with occupation neuroses, Trousseau's original account remains a model of clinical accuracy:

Non-dolorous tic consists of abrupt momentary muscular contractions more or less limited as a general rule, involving preferably the face, but affecting also neck, trunk, and limbs. Their exhibition is a matter of everyday experience. In one case it may be a blinking of the eyelids, a spasmodic twitch of cheek, nose, or lip; in another, it is a toss of the head, a sudden, transient, yet ever-recurring contortion of the neck; in a third, it is a shrug of the shoulder, a convulsive movement of diaphragm or abdominal muscles, – in fine, the term embodies an infinite variety of bizarre actions that defy analysis.

These tics are not infrequently associated with a highly characteristic cry or ejaculation – a sort of laryngeal or diaphragmatic chorea – which may of itself constitute the condition; or there may be

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[1] RENÉ CRUCHET, "Étude critique sur le tic convulsif et son traitement gymnastique," *Thèse de Bordeaux*, 1902.

[2] TROUSSEAU, *Clinique médicale de l'Hôtel Dieu*, 1873, vol. ii. p. 267 *et seq.*

a more elaborate symptom in the form of a curious impulse to repeat the same word or the same exclamation. Sometimes the patient is driven to utter aloud what he would fain conceal.

The advantage of this description is its applicability to every type of tic, trifling or serious, local or general, from the simplest ocular tic to the disease of Gilles de la Tourette. Polymorphism is one of the tic's distinguishing features.

Apart from his studies in objective localisation, Trousseau, as we have seen, recognised that the tic subject was mentally abnormal, but the credit of demonstrating the pathogenic significance of the psychical factor is Charcot's. Tic, he declared,[3] was physical only in appearance; under another aspect it was a mental disease, a sort of hereditary aberration.

Advance along the lines thus laid down has been the work more especially of Magnan and his pupils, of Gilles de la Tourette, Letulle, and Guinon. A meritorious contribution to the elucidation of the question is the thesis of Julien Noir, written under the inspiration of Bourneville and published in 1893. The still more recent labours of Brissaud, Pitres, and Grasset in France, and of others elsewhere, have added materially to our knowledge.

Confining ourselves for the present to the discussion of the latest interpretations put on the word tic, we may be allowed the remark that if the influence of Magnan's teaching has been instrumental in making our idea of tic conform more to the results of observation, nevertheless his view is not without its dangers.

In the opinion of Magnan and his pupils, Saury and Legrain[4] in particular, the tics do not form a morbid entity; they are nought else than episodic syndromes of what Morel called "hereditary insanity," that is to say, of what is usually designated nowadays "mental degeneration."

Now, if by degeneration be meant a more or less pronounced hereditary psychopathic or neuropathic tendency which betrays itself by actual physical or psychical stigmata, then tic patients are unquestionably degenerates. If degeneration unveils itself in multifarious psychical or physical anomalies, the subjects of the tic are undoubtedly degenerates. If a degenerate may suffer from one or other variety of aboulia, or phobia, or obsession, the man with tic is a degenerate too.

Thus understood, the epithet may be applied to all individuals affected with tic. In fact, they *must* be degenerates, if the word is to be employed in its most comprehensive sense. But the explanation is insufficient, inasmuch as the converse does not hold good; all degenerates do not tic.

We may be safe in maintaining, then, that tic is only one of the manifold expressions of mental degeneration, but we are not much enlightened thereby. Obsessions and manias similarly are indications of mental deterioration, yet the fact conveys very scanty information as to their real nature. Physical anomalies – ectrodactyly, for instance – betoken physical degeneration, no doubt; but are inquiries to cease with this categorical assertion? Such certainly was not the idea of those observers whose is the praise for having demonstrated the common parentage of the heterogeneous manifestations of degeneration. Synthesis cannot exclude the work of analysis, and in practice there is scarcely a case to which this doctrine is not pertinent.

Every physical and every mental anomaly is the fruit of degeneration; every individual who is a departure from the normal is a degenerate, superior or inferior as the case may be. As instances of the latter we may specify the dwarf and the weak-willed; of the former, the giant and the exuberant. This sane and comprehensive conception of the subject must command universal acceptance as a synthetic dogma, but it cannot supplant the description and interpretation of individual facts. However legitimate be our representation of tic as a sign of degeneration, it is obviously inadequate if we rest content with styling its subject a degenerate.

Unfortunately the inclination too often is to be satisfied with the term, and to imagine that therewith discussion terminates. Still more unfortunately, in concentrating their attention on the

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[3] CHARCOT, *Leçons du mardi*, 1887-8, p. 124.

[4] LEGRAIN, "Du délire des dégénérés," *Thèse de Paris*, 1885-6.

mental aspect of the disease, some have altogether lost sight of one of its fundamental elements, viz. the motor reaction, and have conceived the possibility of its occurrence without any *tic* at all. Cruchet actually postulates the existence of an exclusively psychical tic, with no external manifestation.

To these questions, however, we shall return. The present introductory sketch is intended merely to demonstrate the ease with which ambiguity arises, and the desirability of its removal. We are fully conscious of the value of the work of Magnan and his school in emphasising a phase of the subject the exposition of which can only result in gain.

The investigation of the motor phenomena of tic is no less encircled with perplexities. Not only are the troubles of motility boundless in their diversity and correspondingly difficult to classify, but they also bear so close a resemblance to a whole series of muscular affections that one is tempted to describe a special symptomatology for each individual case.

For several years there has been, more especially outside of France, a manifest tendency to aggregate all convulsions of ill-determined type into one great class, under the name "myoclonus"; and into this chaotic farrago, it is to be feared, will tumble a crowd of conditions which should be studiously differentiated: the tics, electric and fibrillary choreas, paramyoclonus multiplex, etc., etc.

In the present state of our knowledge, according to Raymond,[5] we must be guided by the lessons of clinical experience, which teach us, first, that the varying modalities of myoclonus develop from the parent stock of hereditary or acquired degeneration; and, secondly, that transitional forms which do not fall into any of the received categories are of common occurrence.

From a general point of view, the deductions are entirely reasonable. There is a suggestive analogy between these conditions and the muscular dystrophies in the persistence with which their multiplicity seems to defy the efforts of classification. The analytic stage witnessed the rapid evolution of such clinical types as the facial, the facio-scapulo-humeral, the juvenile, the pseudo-hypertrophic, not to mention others that bear the name of their observer; but it has been succeeded by the synthetic stage, whose function it is to incorporate all the former myopathies in the comprehensive group of "muscular dystrophy."

Yet here, again, peril lurks in too hasty a generalisation. To give the disease a name is not equivalent to pronouncing a diagnosis. The denominations "myoclonus," "muscular dystrophy," "degenerate," are alike inconvenient. Their scope is at once too inclusive and too exclusive. They may be indispensable; they are assuredly not sufficient.

The possibilities of misapprehension do not end here.

The manifestation of each and every tic – be it a flicker of the eyelid, a turn of the head, a cry, a cough – is through the medium of a muscular contraction. On the very nature of this contraction opinion is divided.

To its distinctive features of abruptness and momentariness is due the epithet "convulsive" habitually assigned it, but the qualification is not secure. Since the time of Willis the word convulsion has been employed in a double sense, to signify *clonic* muscular contractions (the "convulsion" of popular parlance) and *tonic* muscular contractions (a meaning attached to the term only by the scientist).

For our part, we can raise no valid objection to the specification of tics as convulsive, provided always that the existence of clonic convulsive tics and of tonic convulsive tics be recognised. As a matter of fact, clinical observation supplies instances of both sorts.

Nevertheless, attention has been confined by a majority of authors to the consideration of the former variety only, so much so that a whole order of facts which in derivation, essence, and external characteristics ought to be identified with the tics has been passed over in silence. Even on the assumption that the proposal to recognise the two classes cannot be entertained, at the least it is advisable to predetermine the import of the word convulsion, and to speak of *clonic* convulsive

[5] RAYMOND, *Clinique des maladies du système nerveux*, vol. i. 1896, p. 551.

tics. This is the formula of Ferrand and Widal in their article "Convulsion" in the *Encyclopædic Dictionary of the Medical Sciences*. Similarly, Troisier[6] says that the convulsive tic properly so called is characterised by clonic movements, in which opinion Erb and most German observers concur. Tonic tic appears to have been forgotten, and we have thought it our duty to resuscitate it.

Cruchet has quite recently approached the subject in a critical fashion:

To extend the term tic to tonic spasms such as mental torticollis, mental trismus, or permanent blepharospasm, is singularly to outstep the limits of its significance. We believe Erb, Troisier, and Oppenheim are warranted in restricting convulsive tic to clonic convulsions, and the consequent simplification and elucidation of the question lead us to adopt the same view.

If it be solely a matter of terminology, and if universal consent reserve tic for convulsions whose expression is clonic, we shall be the first to withdraw the phrase "tonic tic," making the single proviso that some other designation be found for a condition which differs from the clonic tic only in its external features, and not in origin, pathogeny, or treatment.

What is this other name to be? Are these tonic muscular contractions to be regarded as synonymous with contractures? If so, do we mean myotetanic contracture – to utilise the excellent division imagined by Pitres – as in hysteria, or myotonic contracture, as in Parkinson's disease? The state of muscular contraction in tonic tic does not correspond accurately to either, though it is certainly more akin to the myotonic form; but myotonia is a sort of *caput mortuum* for the too facile classification of cases in reality difficult to place, and we are afraid the term is not calculated to ensure precision of ideas.

Should we be reproached with straining the primary meaning of the word tic by applying it to a contraction of a certain duration, we find ample justification ready at hand in the pages of Cruchet himself. "It was probably in 1656," he says, "that *tique* appeared in the French language, in the works of Jean Jourdin." Now, in the quaint description of the horse's *tique* given by that writer, the signs of the disease are said to be cocking of the ears, rolling of the eyes, clenching and gnashing of the jaws, stiffening of the tail, nibbling at the bit, etc. What else are these than persistent contractions or tonic tics, alternating or co-existing with jerking movements or clonic tics?

We have no desire, of course, to over-estimate the argumentative value of this passage, the interest of which is mainly historical; but we find ourselves wholly in accord with Cruchet when he remarks of the scientific distinction formulated by Willis, and again by Michael Etmüller, between continuous, permanent tonic convulsions, and intermittent, momentary clonic convulsions, that it is uninvolved, practical, and of universal applicability.

In 1768 certain tics were classified among the tonic convulsions by Boissier de Sauvages. Marshal Hall[7] gave an account of various tonic facial convulsions to which Valleix refers as non-dolorous tics or idiopathic convulsions of the face. Coming nearer to our own times, we find the distinction of which we have been speaking again elaborated by Jaccoud,[8] in 1870, and accepted also by Rosenthal.

Doubtless physiologists and pathologists are not invariably at one as regards the proper characters of the two, and subdivisions into continuous tonic contractions as opposed to intermittent tonic contractions have been deemed necessary; but without burdening the subject with a plethora of detail, we think it simple, suggestive, and clinically satisfactory to uphold Willis's generalisations and to enlist their help in the exposition of the tics. Hence, unless under special circumstances, we consider recourse to the epithet "convulsive" superfluous, and we shall employ the word tic by itself, except when there may be occasion to indicate the form of muscular contraction. The gain in conciseness is not likely to be neutralised by any loss of precision.

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[6] TROISIER, *Dictionnaire Dechambre*, art. "Face."

[7] HALL, *On the Disease and Derangement of the Nervous System*, London, 1841.

[8] JACCOUD, *Pathologie interne*, t. i. 1879, pp. 595-8.

From our rapid survey of the vicissitudes through which the tic has passed, we may profitably gather one or two lessons.

In so far as is compatible with its nature, the schematisation of tic is indispensable. The inevitable variability of the personal factor and the absence of a real breach of continuity between any two essentially differing morbid affections ought not to deter us from the attempt to project a line of demarcation between them. Natural science is pledged to the labour of differentiation. It is the glory of Charcot's alternately synthetic and analytic work to have demonstrated the value of this method in the sphere of neuropathology. At the same time, the wisdom of attaching only a provisional importance to any scheme and of welcoming possible modification is of course self-evident. Inexact and undiscriminating inference may be a stumbling-block in the path of progress and inimical to the cultivation of the faculty of observation. Further, inaccuracy of definition not only exaggerates the liability to misunderstanding, but has sometimes also the disadvantage of promoting an illusory belief in the possession of the truth.

CHAPTER III
THE PATHOGENY OF TIC

TIC AND SPASM

Our study of tic can be approached only after a preliminary understanding as to the meaning of two words too frequently confounded even in scientific literature —*tic* and *spasm*. Let us explain, then, once for all, exactly what we intend by the latter.

Etymologically (σπασμός, σπάω, I draw) the word signifies a twitch, but as it is unfortunately considered a synonym for convulsion, the two expressions are used indifferently in medical parlance, though the desirability of restricting the application of the former has more than once been indicated. Littré's definition – "an involuntary contraction of muscles, more particularly of those not under voluntary control" – may appear somewhat idle, as the contraction of muscles not under the influence of the will can scarcely be other than involuntary. His intention was, no doubt, to reserve spasm for convulsive phenomena in non-striped muscle fibres; but in this limited sense the term has not met with acceptance, and it remains equivalent to "involuntary muscular contraction," whatever that may mean. Thus interpreted, it is applicable to any and every involuntary muscular movement, physiological and pathological, to the inco-ordination of tabes, to chorea, athetosis, tremor, etc.

Rather than imagine a new substantive to characterise certain of these muscle contractions, we may retain the word in a somewhat wider though equally precise sense, and follow the distinction drawn by Brissaud[9] in 1893: "a spasm is the result of sudden transitory irritation of any point in a reflex arc; … it is a reflex act of purely spinal or bulbo-spinal origin."

By definition, then, *a spasm is the motor reaction consequent on stimulation of some point in a reflex spinal or bulbo-spinal arc*. To differentiate between the reflex, which is physiological, and the spasm, which is pathological, we may add as a corollary: *the irritation provocative of the spasm is itself of pathological origin, and no spasm can occur without it*. The anatomo-pathological substratum of a spasm is, then, some focus of irritation on a spinal or bulbo-spinal reflex arc, which may be situated in peripheral end organ, in centripetal path, in medullary centre, or in centrifugal fibre. Whatever be its localisation, it will determine a spasm in our sense of the word.

Cortical or subcortical excitation, however, as well as peripheral stimuli, may provoke these bulbar and spinal centres to activity. Irritation of a point on the rolandic cortex, or on the cortico-spinal centripetal paths, is followed by a motor reaction exactly as with afferent impulses; the sole change is in the route taken by the centripetal stimulus; the reflex centre remains bulbo-spinal, and the efferent limb of the arc is as before.

The application of the word spasm to these motor responses to cortical or subcortical stimulation is quite justifiable. Developmentally the grey matter of the cerebral convolutions is ectodermic, as is the skin, and capable of functioning as a sensory surface; it may be considered the end organ of an afferent path that conducts to medullary reflex centres. According to our definition, then, provided the centre of the reflex arc be bulbo-spinal and the irritation pathological, the consequent motor phenomenon is a spasm.

A distinction most nevertheless be drawn between the two cases, inasmuch as in the one the afferent path is peripheral, in the other it is cortico-spinal, and there is a corresponding difference in the clinical picture. Jacksonian convulsions, consecutive to cortical stimulation, do not seem to bear much resemblance to spasmodic movements indicative of peripheral —*i. e.* sensory nerve –

[9] BRISSAUD, *Leçons sur la maladies nerveuses*, 1st series, chap. xxiv. p. 506.

irritation. As a matter of fact, it is not always easy to differentiate the two, except by the aid of concomitant phenomena. The characteristic evolution of the Jacksonian convulsion is of course readily recognisable. We can similarly diagnose an irritative lesion of the internal capsule not so much from the objective features of the convulsive movements as from accompanying indications. In short, there need never be any occasion for confusion. Convulsive conditions attributable to irritation of cortico-spinal centripetal paths have long been described and analysed: they constitute well-recognised morbid entities, among which may be enumerated Jacksonian epilepsy, hemichorea, hemiathetosis, pre-and post-hemiplegic hemitremor, etc.

These clinical denominations for the affections under consideration it is at present desirable to retain. We shall not call them spasms; above all, we must not call them tics, else we shall end by confounding conditions absolutely distinct. The case recorded by Lewin,[10] under the title of "convulsive tic," of a three-year-old infant still unable to walk, who has daily attacks in which "all the muscles" twitch for about a minute at a time, is indeed a most singular tic. We were under the impression that such an attack is usually known as an epileptiform convulsion. Is the term "convulsive tic" quite a happy synonym?

Again, in the recent thesis of Cruchet the attempt has been made to base the pathological physiology of tic on researches of von Monakow and Muratow apropos of the occurrence of choreic, epileptoid, or athetotic movements after certain lesions of the cerebro-spinal axis, and to find an analogy in the action of various convulsion-producing substances (Richet and Langlois). Cruchet's conclusion is that convulsive tic is as often cortical or subcortical as spinal in origin; that it is, in short, a mere symptom, common to many cerebro-spinal conditions.

The same regrettable confusion is discernible in various treatises on neuropathology the work of German and other foreign authors.

As far as we are concerned, the outcome of the whole matter is simply this: if tic is doomed to be used indifferently for convulsion, its retention in scientific terminology is unjustifiable. Rather, then, than widen its application, we prefer to restrict it; we shall employ the term convulsion in its most general sense of "any anomaly due to excess of muscular contraction," of whatever variety or origin; and we shall limit the use of the word spasm to phenomena the result of irritation at any point on afferent or efferent reflex paths, or in reflex bulbo-spinal centres.

In thus indicating our position, we find ourselves once more in accord with generally received opinion since the days of Charcot. These views have been excellently expressed by Guinon:

Convulsive movements differ widely in kind. Some consist of localised spasms in the domain of a motor or mixed nerve, most frequently one of the cranial series – in especial the seventh – consecutive to some anatomical lesion, central or peripheral. The great majority of observers, French and foreign alike, are in the habit of designating such movements "tics." … But they are only partial convulsions limited to the area of some one nerve, not true convulsive tics, differing alike in essential features and concomitant symptoms. From the anatomo-pathological standpoint, moreover, lesions are as constantly present in the one as absent in the other.

The opinion of Brissaud on the subject coincides with our own.

If we suppose now that the cortex ceases to act as a surface of peripheral excitation, and becomes itself a reflex centre, we note at once a complete change. The modification effected by the cortex on afferent impressions is obvious in altered motor reactions, which appear with the stamp of cortical intervention, herein differing from bulbo-spinal phenomena. To this category belong the tics; we shall soon see why and how.

Conformably, then, to convention sanctioned by usage, and especially by the teaching of Charcot and Brissaud, we have given a precise definition to the word spasm, and we can only solicit its general adoption.

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[10] LEWIN, *Arch. d. phys. diat. Therapie*, 1900, p. 281.

To resume briefly the argument we have advanced in the foregoing paragraphs, we maintain:

If in a given motor phenomenon there is no evidence of actual or previous cortical intervention, it is not a tic.

If the motor reaction is consecutive to pathological irritation at any point on a bulbo-spinal reflex arc, it is a spasm.

If the cortex is or has been involved in its production, it is not a spasm.

Should it present, in addition to the fact of cortical participation, certain distinctive pathological features, it is a tic.

It is precisely these distinguishing characteristics that we shall now proceed to examine, preluding our study of them with one or two physiological considerations.

TIC AND MOTOR REACTIONS; REFLEX, CO-ORDINATED, FUNCTIONAL, AUTOMATIC, AND VOLUNTARY ACTS

The instantaneous muscular contraction that follows the application of a drop of sulphuric acid to the limb of a decerebrate frog is an example of a pure spinal reflex. With the persistence of the irritation contraction of the other limb and of the whole body ensues; the simple spinal reflex has become generalised. Observe the frog a little longer. Soon the sound foot approaches the affected limb and attempts by rubbing to remove the point of irritation. A movement of attack has succeeded the simple movement of defence, and indicates a complete change in the nature of the motor reaction. In the first case the limb is withdrawn briskly from the painful stimulus; in the second the animal performs a series of co-ordinated purposive movements. The first reflex is automatic, and so no doubt is the second, since the frog is decerebrate. But a co-ordinated movement is not of necessity automatic from the outset; its automatism may be the sequel to voluntary education. Co-ordination is often a manifestation of cortical activity.

Take, next, the case of the infant. His earliest muscular movements are pure spinal reflexes. Pinch his leg, and he withdraws it; continue the stimulus, and he moves the other leg, his arms, his whole body; he starts to cry. The original reflex is becoming generalised, yet he makes no attempt to remove the source of irritation. Should a particle get into his eye, his lids will blink so long as the pain persists, but he never rubs them to expel the foreign body. In Virchow's phrase, the newborn infant is a spinal animal, endowed with spinal reflexes only; his responses to stimuli are beyond voluntary control.

More complex motor phenomena, however, equally independent of cortical influence, characterise the early days of the infant's life. The contact of his lips with the breast at once elicits a reflex in the shape of sucking movements. These are obviously co-ordinated and adapted for a particular end; suction is a functional act. Yet the cortex plays no part therein; the act is automatic from the beginning. Peripheral excitation from tactile impression of nipple, teat, or finger is sufficient to provoke this reflex response.

Similarly with the functions of respiration and nictitation – their establishment follows the stimulation by air of the respiratory or conjunctival mucosa. The appropriate movements constitute the spontaneous reaction to afferent impulses; they are simple bulbar reflexes. Co-ordinated and purposive though they be, they do not come within the sphere of the will. The newborn child cannot voluntarily accelerate or retard his respiratory rhythm.

But a day comes when the formation of cortico-bulbar or cortico-spinal anastomoses renders possible the interaction of higher and lower centres; respiration may be made quicker or slower; the eyelid may be closed less rapidly, more often. In a word, cortical modification of function becomes a reality.

A further step in advance is soon taken.

Under the "law of least effort" the inhibitory power of the will reduces motor reaction for the attainment of a given object to a minimum. The infant begins to make more complicated movements, attempting the removal of a source of annoyance by direct attack, learning to scratch itself, to spit instead of swallow, etc.

The essential difference between these acts – a thousand other examples might be chosen – and the reflexes of the first group, is that the precise and regular execution of the former demands more or less prolonged education, repetition, and voluntary co-ordination.

It is true these co-ordinated acts are eventually performed with all the spontaneity of the simplest reflexes; voluntary co-operation is no longer indispensable; scratching, spitting, walking, can be effected without any actual intervention of the will. But we must not forget such muscular automatism entails a preliminary training in the shape of frequent repetition of purposive movements

– a training which varies in duration with the individual and the nature of the particular movement. It is only after several years of volitional effort that such acts as locomotion or the expulsion from the throat of an irritant particle become really automatic.

The fact that the newly hatched chick is capable of walking has been advanced as an argument for the existence of congenital automatism. It is true that the chick's movements are very imperfect – it stumbles and falls, as does the infant, on the slightest provocation, and even without any apparent cause; but the rapidity with which certain animals acquire the faculty is so surprising that the latter almost appears to have been innate.

In all phenomena characterised as instinctive we cannot deny the existence of a certain congenital aptitude, the result possibly of ancestral education, owing to which some individuals learn infinitely more quickly than others, and in their case a period of preliminary education may seemingly be awanting. Probably the truth is, however, that this stage has been a very brief one. In man there is a gradual transformation of voluntary into automatic acts. Though no teacher be necessary, teaching is requisite. The infant learning to walk is really independent of his parents, and might, for that matter, be entirely self-taught; but the point remains, however automatic his walking subsequently become, that he begins by voluntarily co-ordinating the movements of his lower limbs and trunk towards a definite end.

Another advance is still to be made.

With increasing cortical development the individual is able, on stimulation no longer peripheral but central in origin, spontaneously to execute movements which frequent repetition has endowed with all the features of functional acts. Of these ideomotor phenomena physical exercises, games, manual trades, readily furnish instances. Swimming, for an instance, requires the rhythmical co-ordination of arm and leg, to attain which perseverance, retentiveness, and above all repetition are essential. At length the time arrives when the swimmer is surprised at the absence of any necessity for voluntary co-ordinating effort on his part. In fact, to reintroduce volition into this acquired automatism would be to court disaster. "What I do naturally," said Montaigne, "I can no longer perform if I attempt it expressly."

From these physiological considerations we are led to make the following classification of motor reactions:

1. Simple spinal reflexes, innocent of co-ordination or functional systematisation, on whose production or inhibition the will has no influence. To this division belong the movements known as spasms.

2. Functional motor acts. Among these we may distinguish:

a. Essential movements, *e. g.* respiration, suction, etc., appearing at birth, and co-ordinated in view of some definite function.

b. Acts such as locomotion, mastication, etc., whose acquisition is subsequent to a more or less prolonged period of education.

c. Non-essential ideomotor acts, acquired later in life, which soon assume all the characters of functional acts.

The movements belonging to the first group in this latter category may manifest themselves without any exertion on the part of the will, but its activity is essential to the perfecting of the second, and the originating of the third.

In this last division are placed the motor phenomena known as tics.

TIC AND CO-ORDINATION

We have thus come to see that a tic is a co-ordinated, systematised, purposive act. The majority of observers are satisfied on this point, although there exist various differences of opinion, more apparent than real, the inevitable result of disagreement as to the interpretation of certain expressions. It is imperative to obviate misunderstanding once and for all.

In his first contribution to the study of the disease which bears his name, Gilles de la Tourette gave the general description of *motor inco-ordination* to the convulsive movements of his patients. It has been argued by Guinon, on the contrary, that they are really systematised, and that they reproduce, in an involuntary manner, the co-ordinated movements of everyday life. That this is sometimes the case Tourette subsequently admitted, but he still professed their frequent actual inco-ordination.

This divergence of opinion is entirely attributable to difference of interpretation. Littré's definition of muscular inco-ordination is, "A condition occurring in various diseases of the nervous system, in which the patient cannot co-ordinate the necessary muscular movements for walking, grasping an object, etc." In this sense the term is applicable indiscriminately to the gesticulations of choreic, athetotic, or tic patients; to the ataxia of tabetics and others; to the tremor of disseminated sclerosis or paralysis agitans, etc. An expression so general is not merely of no diagnostic value; it leads to positive confusion.

It is precisely in the type of inco-ordination that the difference lies. As rigorous a distinction must be drawn between the gestures of chorea and the gesticulations of the sufferer from tic as between the tremor of insular sclerosis and of Parkinson's disease.

In assigning an exact meaning to the term muscular inco-ordination, we cannot do better than quote the remarks of Guinon:

The tabetic who throws his legs to right and left, who as he sits at table cannot carry his spoon to his mouth, furnishes an instance of true motor inco-ordination. On the other hand, the subject of tic performs his voluntary actions with perfect assurance; though his infirmity occasion all sorts of ridiculous involuntary arm movements, he never brings his fork against his ear or his cheek, nor does he spill a drop from his glass; his walk may be interrupted by a sudden halt to bend his knees and kneel, or to strike his foot violently on the ground, but he never trips one leg over the other and never falls.

In his article in the *Dictionnaire Jaccoud*, Letulle distinguishes two kinds of tics:

The *convulsive tic* consists of a series of partial convulsions, while the *co-ordinated tic* is the expression of some complex act by a sequence of muscular contractions for that purpose. In the former case the resulting movement is irregular, abnormal, and useless; it is a muscular "shock" evolved without reason and continued without effect… The normal individual usually possesses *in potentia* all the elements for the genesis of a co-ordinated tic. Some little trick or mannerism, arising perhaps from the necessity of gaining time for reflection, or from the desire of concealing some innate timidity, or of dissimulating some preoccupation, becomes sooner or later involuntary and automatic, and though maintaining its regularity and co-ordination, passes insensibly into the realm of pathology.

The distinction, however, is far from being absolute. Letulle himself admits it is a question of degree rather than of kind; the co-ordinated tic differs from the first variety only in its greater extent, complexity, and duration. Now, the convulsive tic may be a local, partial, irregular, abnormal convulsion, yet these characteristics are not sufficient to differentiate it: biting the lips is classed by Letulle as a co-ordinated tic, but it is surely a local, partial, irregular, abnormal muscular act; and the explosive laryngeal "ahem!" he would similarly place, yet it cannot be said to be a phenomenon characterised by its extent, complexity, and duration.

According to Guinon, a further distinguishing feature of the convulsive tic is its frequent though inopportune reproduction of some reflex or automatic purposive movement of everyday life, whereas

we have just seen that one of the elements in Letulle's co-ordinated tic is its purposiveness. In a word, these observers apply the same epithet to two varieties of tic which they are endeavouring to separate.

The explanation of the apparent contradiction is simple. A gesture which seems meaningless and useless to-day becomes intelligible and logical to-morrow, when we learn the reason for it. In the course of an attack of conjunctivitis a patient acquires the habit of winking his eye, and though the inflammation subsides, the habit persists. If we are ignorant of its cause, are we to call the tic convulsive since it appears to us needless? And if we do know its origin; can we say it is co-ordinated when one muscle only is involved in the contraction?

The distinction drawn by Letulle between the two groups may hold good in some cases, but certainly not in all, and in our opinion it is preferable to abstain entirely from the attempt to base a classification on variation in muscular contraction. Noir remarks very justly that intermediate forms occur which are difficult to place in one or other category. In face of the confusion to which an illogical division inevitably leads, we may safely leave this question aside. In our view, the motor phenomena of the disease are always systematic, co-ordinated movements, directed for the attainment of some definite object. We exclude all simple bulbar or spinal reflexes, and all spasms, since the cardinal feature in these conditions is the absence of any functional systematisation.

THE GENESIS OF TIC

We have seen how various purposive, co-ordinated movements may, by dint of education and voluntary repetition, become automatic and be automatically repeated should occasion arise. Imagine some such act recurring involuntarily without any apparent reason and for no apparent object; what does such an anomaly signify?

Take, for instance, the case of a young girl who inclines her head on her shoulder to relieve the pain of a dental abscess. The act is called forth by a real exciting cause; the muscular response is voluntary, deliberate, undeniably cortical in origin: the patient *wills* to appease the pain by pressing and warming her cheek. Should the abscess persist, the movement will be repeated less and less voluntarily, more and more automatically; but as the why and the wherefore still remain, there is nothing pathological about it.

With the healing of the abscess, however, and the consequent relief of the pain, the girl still inclines her head on her shoulder from time to time, albeit cause and purpose have ceased to operate. Her primarily volitional, co-ordinate, systematic, motor reaction is now automatic, inopportune, and meaningless: it is a tic.

Charcot[11] has given us an excellent description of the process:

However complex and bizarre may appear the convulsive phenomena known as tics, they are not always as irregular, inco-ordinate, and contradictory as superficial examination might lead one to believe. On the contrary, they are, as a general rule, systematised; in a given case they recur always in an identical manner, reproducing, and simultaneously exaggerating, complex, automatic, purposive movements which are essentially physiological; they are in a sense the caricatures of ordinary acts and gestures. The tic is not in itself absurd; it appears so only because it occurs inappositely, without obvious motive. Source of irritation is absent, yet the patient scratches himself; he blinks, but no foreign body is to be detected in his eye.

Mere repetition does not, cannot, evolve a tic in every case. Not all who would may tic; psychical predisposition in the shape of volitional enfeeblement is a *sine qua non*.

Of the rôle played by mental insufficiency in the genesis of tic we shall have much to say later. The point we are desirous of emphasising now is that the first manifestations of tic have their origin in, and are dependent on, cortical activity, at least in a majority of cases.

Notwithstanding painstaking investigation, determination of the initial cause may no doubt be difficult in some instances, owing to the patient's ignorance or forgetfulness; for that matter, the observer may not know how to set about his task. Prolonged interrogation, however, and due consideration of the patient's environment, will generally enable him to reconstruct the pathogeny of the condition.

It has been our practice for some years now to examine with especial care into the mode of onset, and to scrutinise the reasons for the particular localisation, of any given tic; and we have been able, in practically every case, to rediscover the exciting cause, and consequently to explain the form taken by the tic in its earliest manifestations as a voluntary response to the stimulus. Time may have distorted the original movement, but a little patient analysis will facilitate its recognition even in the caricature made of it by the tic.

A few concrete instances will help us better to understand the nature of this psycho-physiological mechanism.

An individual is wearing a collar too small for him, and its frayed edge chafes his skin; the neck is at once abruptly inclined away from the irritating point – a simple spinal reflex movement of defence. Now that he is warned by the sensation of pain, he wishes to avoid it, which he does by

[11] CHARCOT, *Leçons du mardi*, 1889, p. 464.

bending his head to the opposite side. The act is similar to the preceding, but of a totally different nature; it is voluntary, not involuntary; cortical, not bulbo-spinal.

Next day the collar is replaced by another of ampler proportions. There is no further irritation of the skin, and accordingly no occasion for deviation of the head. Memory of the disagreeable sensation may perhaps incite him to verify the disappearance of the irritation by a few movements of the head, and in the normal individual the matter ends there. Even should the idea of repeating the gesture, now become meaningless, occur to him, he banishes it by an effort of the will.

With the candidate for tic things pass in quite a different fashion. Uncalled for though it be, he performs the brusque movement of yesterday perhaps with a view to satisfying himself that the pain is non-existent, but he is not thus satisfied. He does not limit his experiments to one or two attempts. He repeats it frequently and complacently. The original source of irritation is gone; the movement intended at first to relieve it persists. Soon the whole trouble is forgotten, but the reiterated gesture becomes habitual and automatic; it may have been rational yesterday, but to-day it is superfluous, if not actually prejudicial; it is a tic. In its evolution the cortex has had a part, and the very untimeliness of this cortical intervention indicates a certain disorder of psychical function.

Or again: a speck gets under my eyelid, and I wink – a spasmodic act independent of the cortex. The speck is removed, but the conjunctiva remains a little tender, and I wink again – still only a spasm. All trace of irritation vanishes, yet the blinking persists: it is degenerating into a tic.

Wherein consists the rôle played by the cortex in the production of such phenomena? It intervenes to order the repetition of the gesture provoked involuntarily, in the first instance, by peripheral excitation; and though one may not always be able later to discover evidence of this, one must at the least recognise the fact that the mere inopportune persistence of the movement bears witness to psychical imperfection.

It has been remarked by Guinon that patients suffering from tics of blinking attribute them to the presence of foreign bodies; he declares, however, that "if they bear a superficial resemblance to simple tic, they differ widely in essential characters and from the point of view of prognosis. They are really involuntary movements of reflex origin, occasioned by abnormal sensations, usually of pain." He cites as a typical instance the "tic douloureux" of the face.

The description is strictly accurate provided the pain continue; such acts are not tics, they are spasms. On the other hand, the perpetuation of the movement in the absence of all exciting cause and pain constitutes it a tic. In this way a spasm may be the forerunner of a tic, and in many cases no doubt a purely spasmodic motor reaction may determine the form and localisation which the latter will adopt; but, as we have said, its first manifestation is usually a voluntary act of definite causation, and directed to the accomplishment of a definite object.

The candidate for tic is mentally unstable. Indifferent perhaps to acute suffering, he may become entirely preoccupied by some trifling sensation of pain or by some source of petty annoyance, to rid himself of which he will resort to all sorts of tricks and assume all sorts of odd attitudes – tic germs quick to develop in suitable soil.

In many motor reactions of the class we are now considering the main object is the *avoidance of some abnormal sensation*, suppression of which, however, brings no relief to the patient's mind. He dreads its reappearance; he must assure himself of its absence. He taxes his ingenuity in the attempt to rediscover the sensation, and multiplies his gestures and attitudes until once again he experiences it. The satisfaction he felt originally in shunning the pain or the discomfort is paralleled by the satisfaction he now knows in its rediscovery. In each instance the motor phenomena are voluntary and co-ordinated, but their excessive repetition betrays unstable mental equilibrium.

Instructive examples of this pathogenic process are furnished by the history of O., and by the case of a young patient J., from which we extract the following:

In 1896, during the holidays, a tic, secondary to some slight nasal ulceration, made its appearance. The child learned the trick of wrinkling its nose and of puckering its upper lip, sometimes

attempting by various facial grimaces to lessen the irritation due to the little nasal sore, sometimes, on the contrary, finding delight in deliberately seeking the unusual sensation. The sniffing soon became involuntary, and for the next two months, long after the ulceration was healed, this nasal tic continued.

Then another cause came into operation, occasioning a new gesture and entailing a new tic. Cracking of the labial mucous membrane during winter led to incessant licking and nibbling at the roughened surface. With the first excoriation the patient proceeded to moisten his lips with his tongue, whence fresh cracks, followed by the renewal of nibbling and licking movements.

In March, 1899, after a severe attack of influenza accompanied by fever and pains in the joints, he began to complain of stiffness and a sort of cracking in the neck, disagreeable rather than painful. To avoid this, or to reproduce it – as one sometimes amuses oneself by "cracking one's joints" – he quickly learned to make all sorts of bizarre head movements, and so a tic of the neck started which lasted several months.

Noir has directed attention to a tic of frequent occurrence among amaurotic idiots, consisting in rapid to-and-fro movements of the finger before the eyes. The explanation seems to be that their blindness is not absolute enough to prevent some faint appreciation of light by retinal stimulation, and the effect of the luminous impression is enhanced by the alternation of light and shade sensations produced by the waving of the fingers in front of the eyes. The tic is neither more nor less than a search after this effect.

Another case in point is reported by Dubois[12]:

The patient is a young woman twenty years old who has acquired the habit of beating her right elbow against her chest fifteen or twenty times a minute, until it happens to impinge with rather greater violence on a whalebone in her corset; this is accompanied by a slight guttural cry. It would appear the sole satisfaction in her tic is in the attainment of this object, since it is succeeded by temporary cessation of the movements. Their constant repetition has caused an insignificant erosion of the skin over a limited area on the elbow, and it is only when this particular spot is touched that the ejaculation is uttered and the tic arrested. If the elbow be at rest, the head is inclined from left to right several times a minute.

Evidently, then, in the subjects of tic the *impulse to seek a sensation* is of very common occurrence, as is also the *impulse to repeat to excess a functional act*. It is precisely this exaggerated and inopportune multiplication of movement that is pathological.

The mother of one of Noir's patients was always tempted to repeat any simple purposive movement that she had made a moment before, even though the reason for the act no longer existed.

The imperiousness of these impulses, and the peculiar relief attendant on submission to them, accentuate the closeness of the resemblance between tic and obsession, to which reference will be made later; but it is necessary at this early stage to indicate the bearing of these psychical phenomena on the pathogeny and diagnosis of tic.

Many of the conditions with which we are dealing are characterised in addition by an emotional element. Dupré[13] believes an emotional shook is the exciting cause of tic, as it sometimes is of obsessions.

Apropos of this view, we may quote again from the history of the young patient J.:

During his holidays he improved sufficiently to enable him to resume his classes, but another attack of influenza in the beginning of 1900 was the occasion of a relapse. He began to complain of overpowering fatigue; became depressed and morbidly anxious about his future; had attacks of hysterical sobbing; suffered great mental anguish, accompanied by flushing and profuse perspiration; in short, he fell into a veritable state of *mal obsédant*.

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[12] DUBOIS, "Traitement des tics convulsifs par la rééducation des centres moteurs," *Bulletin général de thérapie*, April 30, 1901.

[13] DUPRÉ, *Soc. de neur. de Paris*, April 18, 1901.

At the same time, the slightest pain or annoyance was a pretext for his tics to exhibit themselves with redoubled vigour. Even the mere idea of his tics, the fear of them, incited him further in the same direction. He seems then to have set himself to invent new movements, and forgetting forthwith that he himself was their creator, became alarmed at them as sure signs of the aggravation of his disease.

Analogous details will be found in all cases which have been studied as well from the mental as from the physical side. For our part, we consider a tic cannot be a tic unless it be associated with a certain degree of mental instability and imperfection, indubitable evidence of which is furnished by a psychical abnormality of constant occurrence in this malady – viz. anomalies of volition.

TIC AND WILL

It might be imagined that a tic would cease to exist as such were a voluntary element to enter into its constitution. The fact, however, that tic is the sequel to frequent repetition of a primarily voluntary act, and that it may be arrested, transformed, or aborted, is proof to the contrary of which there is no gainsaying.

The truth is, once a tic is established, it has all the appearance of an involuntary movement, but that nevertheless its manifestations may be either modified or inhibited by an effort of the will is patent from clinical observation. This is a fact of great importance.

Spasm knows no control (says Brissaud). Nothing will arrest the bolus of food as it passes into the pharynx, unless by the inversion of the whole function of deglutition… As regards tic, however, inhibition is possible because the phenomenon is cortical. In almost every case, reinforcement of the will can momentarily at least check it.

Consensus of opinion admits diminution of will power to be the cardinal mental symptom of the tic patient. Inhibitory insufficiency, as Blocq and Onanoff say, allows the persistence of fixed ideas of movement which reveal themselves by involuntary acts. Noir has admirably supplemented the researches of Ribot in this direction:

The infant's activity is purely reflex, and manifested by a profusion of movements, to suppress or restrain the majority of which is the task of education. It is highly probable that any co-ordinated tic whose evolution can be traced at all has its origin in the infant's spontaneous muscular play. From this point of view the frequency of these movements in idiots is readily explicable, since their intellectual development never gets beyond the stage of childhood. The more confirmed the idiocy and the more rudimentary their mind, the more prone are their tics to be complex and inveterate.

These remarks are pertinent to the case not only of idiots, imbeciles, or backward children, but of all the subjects of tic. In them some degree of mental infantilism is of invariable occurrence. The tic patient has the weak and capricious will of the child; young or old, he does not know how to *will*; if his willing be sometimes excessive, it is never resolute. Were it otherwise, he might control his meaningless gestures, but his efforts are both feeble and ephemeral.

TIC AND HABIT

The view which regards tic as a "pathological muscular habit" provides emphatic illustration of the sinister influence of volitional infirmity.

This aspect of the question is of deep significance. If we define a habit, in the words of Littré, as a "disposition acquired by the repetition of the same acts," we can easily conceive how intimate is the relation between habit and automatism, and how constant rehearsal of the same movement in the same manner will create a mode of motor reaction independent of the function of the will. It has been made clear already that the phenomena of tic, regarded from the motor standpoint, reveal an identical process at work; but the fundamental difference between the habits of normal individuals and those of tic subjects is that the former can be checked or modified by voluntary effort, whereas the latter gradually acquire the pathological features of tenacity and irresistibility.

In a typical case of tic (says Dupré)[14] the establishment of a reflex sensorimotor diastaltic arc, viâ the cortex, between peripheral stimuli of whatever nature and corresponding muscular reaction, is a sign that predisposition has changed the physiological to the pathological, and transformed a habit into a tic.

Guinon argues, however, that tic ought not to be cited in the catalogue of diseases, since it is ultimately a deep-rooted "bad habit" only, not a pathological fact.

We are not prepared to maintain, of course, that all motor "bad habits" are tics, for a whole host of familiar gestures, tricks, and mannerisms do not merit the name, superfluous and even detestable though they may be. It is true they are the product of education, and become, since the will has less and less to do with their appearing, at the last purely automatic; they may thus developmentally bear a close resemblance to tics. As Letulle says:

The infant who is constantly sucking its thumb, the individual who never ceases picking his teeth, or rubbing his eyes, or lips, or chin, or ear, who is for ever scratching his head or his beard – all have no doubt, originally, been driven to the repetition of the trick by some real necessity in the shape of dental caries, or ciliary blepharitis, or pityriasis capitis; but removal of the cause is not followed by cessation of the gesture. A man will learn the habit of perpetually smoothing his hair, and will not desist from his favourite trick though he become absolutely bald.

But such automatic habits and mannerisms are not genuine tics so long as the movement executed conserves in form the characters of a normal gesture. Be it never so inopportune or absurd, it is not a tic. It comes rather under the heading of *stereotyped acts*, whose kinship with, and difference from, the tics, have been well demonstrated by Séglas.

While the stereotyped act has all the appearance of a normal movement, the tic, on the contrary, is a "corrupt" muscular contraction; its subject is irresistibly impelled to its performance, and any attempt at repression is painful, sometimes even agonising. Victory is perhaps not entirely impossible, but any arrest is, as a rule, only temporary, and entails suffering which well deserves to be considered pathological.

On the other hand, the thousand illogical and absurd mannerisms of which we have been speaking betray no irresistible imperiousness in their execution, and require no agonising struggle for their repression. They are not tics. The crucial point in the differential diagnosis is the presence or absence of mental suffering.

The distinction may be further elaborated. Concentration of the attention may diminish the intensity or even inhibit the occurrence of a tic; inversely, a simple bad habit is manifested preferably during this very concentration. In the heat of physical or intellectual labour, we have all our favourite and characteristic tricks: we curl our moustache, we twist our beard, we scratch our forehead, we rub

[14] DUPRÉ, *loc. cit.*

our chin, we nod our head, we fidget with our fingers in reading, speaking, reciting – in any mental or physical exercise requiring our attention we reveal innumerable little oddities of movement; but let our thoughts be directed for an instant to these gestures of distraction, and they disappear forthwith, to reappear afresh when we are absorbed in our work again. Charcot used to twist his hair round his index finger so intricately that to disentangle the finger one day a lock of hair had actually to be cut off. It was a trick of his, not a tic.

In the case of the latter, leisure of mind and body is the signal for the apparition of the inopportune movements. Any form of effort demanding the attention will, as a general rule, lessen their frequency or abolish them altogether.

Trousseau quotes the case of a young girl afflicted with severe tic who could play through any piece on the piano without the slightest interruption. Guinon similarly has known cases, one of whom could juggle accurately with knives, and another whose infirmity did not prevent her from taking a successful part in operatic ballet. Young L. is passionately fond of dancing, but he never tics in the ballroom. O. is an excellent amateur billiard player and never handicapped by his tic when playing, or, for that matter, when fishing or fencing; but if his attention be not thus absorbed, it is only with the utmost difficulty that he can master his tic.

We all have met the young man who cannot strike a ball at tennis without protruding his tongue at the same moment; his partner bites his lips at any difficult stroke. At other times neither betrays the slightest grimace; neither is conscious of any effort in maintaining repose. The occurrence of these movements during active concentration of the attention, and the absence of either difficulty or distress in checking them, justify their classification as stereotyped acts, in subjects psychically normal.

Tic is a pathological habit, to use Brissaud's phrase, and its description as a habit disease is in harmony with the facts. We must expect, of course, to meet every intermediate variety between the bad habit and the true tic, but this need not deter us from drawing the above-noted distinction, the application of which will be found not without value in the great majority of instances.

TIC AND IDEA

As we have already seen, a peripheral stimulus may originate a cortical reflex whose expression is a motor reaction, or the reaction may take place where the stimulus is entirely cortical; in other words, an idea may be the starting-point of a movement which may in its turn degenerate into a tic. All that has been already said of these phenomena is applicable to this movement of ideational origin. It too will be transformed into a tic when it is repeated without exciting cause and for no definite end, when its reiteration becomes imperious and irresistible, its suppression accompanied with malaise and its execution with relief.

Tics of this sort are numerous enough. "To think an act," as Charcot used to say, following Herbert Spencer and Bain, "is already to accomplish it. When we think of the movement, say of extension of the hand, we have already sketched it in our minds; and, should the idea be too strong, we execute it."

In this connection Grasset most appropriately cites the fact that the peoples of mid-France evince a peculiar aptitude for mimicking by suitable gesture the various ideas which occur in the course of conversation. "You will always succeed," he says, "with the following little experiment. In a drawing-room ask ten individuals consecutively to tell you what a rattle (*crécelle*) is. The answer will in every case be accompanied by a gesture expressive of an object that turns. To think an act is already to perform it; the thought and the gesture are wellnigh inseparable."

The truth of this observation is not a question of geography. Examples are met with on every hand. It is a law, abundant evidence for which is furnished by all who tic. But however exuberant be accompanying movements of explanation, they must present the additional features of inappositeness and irresistibility to be denominated tics.

A case that has come under our own notice is worth mentioning because of its peculiarity and instructiveness. The patient was an artistic, well-educated, and well-travelled man, gifted to a remarkable degree with the faculty of assimilation. Apart from genuine tics in the shape of sudden jerks of face, arm, or leg, he had acquired the trick of accompanying his conversation with a peculiar mimicry of its content. Not satisfied with providing a gesture for nearly every word, he divided the words themselves into syllables for each of which he had an appropriate action, whence arose a series of mimicry puns of most unexpected effect.

For instance, during the enunciation of the following sentence, "We were on a paddle steamer, with captain, commissaire, and doctor," he first of all imitated the movement of paddles; he then put his hand, with three fingers apart, to his forehead (the captain's cap has three lace bands); to mimic the word commissaire he shook hands with himself (*commissaire—comme il serre*); to express the word doctor he pretended to touch imaginary breasts on his body (*médecin—mes deux seins*); and so on throughout all his conversation.

Voluntary execution of these puns had been succeeded by complete automatism, yet they were not tics, because, however singular the mimicry, it was appropriate; whereas his facial grimaces, the shrugging of his shoulders, the tapping of his heels, repeated every minute for no reason or purpose, were real tics.

If, when asked what a rattle is, we make a turning movement with our hand, or if when asked to explain the word *brandebourg* we indicate an imaginary arrangement of braid on our coat – these two experiments always succeed – we are attempting to express an idea by mimicry at the actual moment of its arising in the mind; but the subject of a tic – which may primarily have been the representation by mimicry of an idea – continues the gesture long after the idea which provoked it has vanished.

A woman speaking with animation at a telephone will make with face or hand a thousand useless gestures, useless since her friend cannot see them, but they are not tics, even though they may be justly described as functional, automatic, superfluous, and inopportune. If we are normally

constituted, we betray a pleasant idea by a smile, we express our conviction by an appropriate gesture of affirmation; if we smile or gesticulate with no motive for doing either, we have begun to tic. It is not sufficient that the act be untimely at the moment of execution; we must be persuaded that it no longer stands in any relation to the idea which called it forth at the first, and that its repetition is excessive, its inappositeness constant, its performance urgent, and its inhibition transient, before we can say it is a tic.

Should the cortex be functioning harmoniously, afferent impulse and efferent reaction stand in due proportion one to the other; but any disturbance of psychical equilibrium —*e. g.* the fixity of some idea combined with inhibitory weakness – will effect a corresponding disturbance on the motor side. Charcot used to speak of tics of the mind revealing themselves by tics of the body. Fear may elicit a movement of defence, to persist as a tic after the exciting cause has vanished.

It is of course quite incorrect to say that each and every motor reaction to a pathological idea is a tic. The psychasthenic who in his fear of draughts shakes the door-knob a hundred times a day to make sure the door is shut, is not a martyr to tic; in spite of the absurdity of his action, it is logically connected with the idea that originated it, and it is the idea which is absurd. To make an involuntary movement of defence against some purely imaginary ill, on the other hand, and to continue when all fear is past, is to tic.

In practice it may not always be a simple matter to uphold the distinction, but some such demarcation of the tic's limits is called for if we are to avoid its being applied to any act performed under the compulsion of a pathological mental state.

In its mildest form the mental trouble may consist of an ordinary psychomotor hallucination, but if it be not projected as an objective phenomenon it does not deserve to be called a tic. One of Séglas's patients met a choreic woman undergoing electrical treatment in the same room as herself; on leaving she felt as though her own right arm were the seat of spasmodic movements similar to those of the choreic patient, but as they did not betray themselves by any external sign they cannot be considered tics.

The exteriorisation of the hallucinatory phenomenon suffices at once to bring it within the scope of our definition. Innumerable tics arise in this way, provoked, mayhap, by some or other insignificant psychomotor hallucination. The attitude adopted by certain patients, as remarked by Séglas, is an index to the nature and seat of their hallucinations. Some keep their tongue firmly bitten between the teeth; others cram their mouth with pebbles, or compress their epigastrium tightly, under the impression that it is the source of their voice. Should such gestures persist while the hallucination does not, they may give rise to what we are in the habit of calling "tonic tics," or "tics of attitude," but we must repeat that the presence of a convulsive element is essential; however out of place or absurd the contractions are, if otherwise they are normal we are dealing with what Séglas designates stereotyped acts. To this question we shall return later.

TIC AND CONSCIOUSNESS

According to Guinon, proof that "convulsive" tic is conscious is furnished by the accurate description and rational explanation patients supply of their affliction. Similarly Letulle's "co-ordinated" tic is a conscious act, at least in its commencement; it is a "bad habit" which finally passes beyond the limit of consciousness.

Now, while no doubt most subjects show a keen appreciation of their tic when their attention is directed to it, they are none the less unconscious of it at the moment of its manifestation. This is the ground on which Letulle bases his statement that all tics, of whatsoever variety, are habitually outside the domain of consciousness. To this fact so much importance has been attached that the attempt has been made, more especially by Blocq and Onanoff,[15] to differentiate the conscious from the unconscious tic.

In our opinion, the distinction is ambiguous and tends needlessly to complicate our ideas on the subject. The patient with "convulsive" tic is conscious of it in the sense that he is well aware of its existence, yet how can the gesture be a conscious one if it is synchronous with mental preoccupation? On the other hand, the patient with "co-ordinated" tic may bite his lips unconsciously, but he is by no means ignorant of his little failing.

This divergence of opinion depends entirely on the possibility of regarding the phenomena at different moments during their production. The subject is in a position to appreciate his state both before and after the tic, not during it. In a sense it may be said that tic is alternately conscious and unconscious, in which respect it is comparable to the obsession; the close analogy between the two conditions we shall indicate more fully later. As a matter of fact, the same holds true for every variety of spasm.

We are not disposed to introduce here a term sacred to the psychologist and to speak of the tic as subconscious. Pierre Janet does not admit the absolute unconsciousness of habit; even when the latter has degenerated into a tic, it is not outwith the realm of consciousness. We prefer not to venture, however, into the perilous region of the subconscious, in spite of our appreciation of the happy results attributable to its careful and discerning exploration by observers such as Janet himself.

According to Cruchet, certain so-called psychical tics are always subliminal – for instance, the imitation tics common in children and in idiots.

But if the consciousness of the normal adult be, as it admittedly is, a most elusive conception to define, how infinitely more precarious is the task in the case of idiots or infants! Cruchet says it is impossible to be sure whether at any given moment a tic has been above the threshold of consciousness or not; and we do not think the question will be elucidated by the introduction of data so difficult to comprehend as the consciousness, unconsciousness, or subconsciousness of the tic patient. In any case, these conceptions are quite inadequate for the establishment of useful distinctions. All that we can say is that the participation of consciousness in the phenomena of tic varies in time and degree. To hazard farther would be to invite disaster.

[15] BLOCQ and ONANOFF, *Maladies nerveuses*, 1892.

TIC AND POLYGON

The proposal has been made by Grasset to apply his attractive hypothesis of the cortical polygon to the interpretation of the pathogenesis of tic. It is desirable, first of all, to recall briefly the significance of the word polygon in the sense adopted by that neurologist.[16]

At the central end of the physiological ladder is the superior or cortical system of perception neurons whose cells form the grey matter of the convolutions. Physiological and clinical research necessitates the subdivision of this system into two groups – the neurons of psychical automatism, and the neurons of superior (*i. e.* voluntary or free) cerebration. The former function is not of the same level as the ordinary reflex arc, since it is in relation to co-ordinated, intelligent, and in a sense conscious acts; at the same time it is to be distinguished assiduously from the latter, in which we include our personality, moral consciousness, free will, and responsibility.

Activity on the part of the inferior psychical neurons is seen:

1. In normal individuals – during sleep, dreams, and acts of distraction.

2. In the nervous – in nightmares, oniric states, table turning, thought reading, the use of the divining rod, automatic writing, cumberlandism, spiritualism.

3. In the diseased – in somnambulism, catalepsy, hysteria, certain phenomena of epilepsy, hypnotism, double personality; also in some cases of aphasia, and in such conditions as astasia-abasia. Every manifestation of this inferior psychism is characterised by spontaneity, herein differing from mere reflex acts, but not by freedom, which is the *propre* of superior psychism.

The various neurons subserving the former or inferior function are cortical, and form the cortical polygon. Situated at a higher physiological level are those for the latter function, united in what I designate the centre O.

Grasset's general conception of tic is accordingly as follows:

In contradistinction to a pure reflex, a tic is a complex or associated act. There is, however, more than one centre for the elaboration of these complex or associated acts, notably the bulbo-medullary axis, and the cerebral polygon, as we call it. The former serves as centre not merely for simple reflexes, but for true associated acts also, such as conjugate deviation of the head and eyes, walking movements in the decerebrate animal, etc.

We can conceive, then, a first group of non-mental tics corresponding to and reproducing these movements of bulbo-medullary origin.[17]

Let us turn now to our polygon formed by the various centres of psychic automatism. Polygonal reactions, such as writing or speaking, exceed both simple reflexes and bulbo-medullary associated acts in complexity; they are to all appearance spontaneous and in a certain measure intellectual, but they are neither free nor conscious – attributes that distinguish the functions of the centre O, the seat of the personal, conscious, voluntary, responsible ego. The polygon consists of receptive sensory centres for hearing, vision, and general sensibility, and of transmitting motor centres for speaking, writing, and various body movements. They all communicate with each other, with O, and with the periphery, so rendering possible voluntary modification of automatic action. In some cases, on the contrary, there may be a sort of dissociation between O. and the polygon, when the activity of the latter becomes supreme, as during sleep – we dream with our polygon – or in distraction.

In states intermediate between the physiological and the pathological, pure independent polygonal action may reveal itself in the remarkable phenomena of nightmare, the divining rod, table turning, automatic writing, etc., while certain aphasias and agraphias, somnambulism, catalepsy, and various hysterical conditions constitute the pathology of the polygon.

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[16] GRASSET, *Anatomie clinique des centres nerveux*, Paris, 1900, p. 5.

[17] GRASSET, *Leçons de clinique médicale*, 3rd series, fasc. i. 1896, pp. 5, 38.

The fact that all mental attributes and functions are situate in O definitely negatives, in my opinion, any classification in the category of mental diseases of such conditions as hysteria, so many of whose manifestations are polygonal alone.

Our second group of tics – polygonal tics, we may style them – are correspondingly associated, co-ordinated, and psychical, but not mental; they have nought to do with the superior psychism of O.

Finally, in direct and strict dependence on an actual idea is a third group of tics, the psychical tics properly so called.

We have reproduced Grasset's theory in some detail since it is one of the two most recent contributions to the study of the tic's pathogenesis. The other is that of Brissaud.

An apparent lack of harmony between the rival hypotheses is, we shall see, due rather to a difference in the interpretation of certain terms than to a real opposition of ideas.

Brissaud's view that the tic is a co-ordinated automatic act and consequently cortical is objected to by Grasset. Every automatic co-ordinated act is not of necessity cortical. Conjugate deviation of the head and eyes may be of bulbar origin; certain spinal movements even may be no less co-ordinated and automatic. The decerebrate animal's walk may be perfect in its co-ordination.

Careful analysis shows the divergence of opinion to arise merely from a differing significance attached to the word origin. Brissaud is considering the origin of the tic in time, at the moment of its appearance; Grasset its origin in space, at the seat of its production. Once the tic is constituted, its repetition each moment is a manifestation of polygonal activity, but it is none the less true that the movement which has degenerated into a tic had its source in cortical, *i. e.* psychical, activity.

Any one who appreciates the import of Grasset's ideas will readily understand his terminology; it is at the same time expedient that the possibility of ambiguity in the use of words etymologically synonymous should be avoided. Now, however judicious be the distinction he draws between psychical and mental, it is to be feared it is not always adequately grasped: we do not intend, therefore, to employ either mental or psychical tic in our vocabulary, still less "psycho-mental" tic (Cruchet). As for bulbo-medullary tic, it appears to us to be identical with spasm as we have defined it, unless indeed it is to be taken as signifying a tic begotten of a spasm, in which interpretation Grasset and Brissaud both acquiesce.

TIC AND FUNCTION

We must now pass on to elaborate our conception of tic as a disordered functional act.

The term function is employed to denote various biological phenomena differing widely in manifestation and design. Vegetative functions such as digestion, circulation, urination, etc., are regulated by a special unstriped muscle system, the mechanism of which cannot be suspended by cortical interposition; hence under no circumstances can its derangement bring a tic into being.

Other functions, subserved by striped muscles, come within the range of voluntary activity. Some —*e. g.* respiration – are essential to the maintenance of life, and scarcely to be differentiated from those we have called vegetative. Others, such as nictitation, mastication, locomotion, are no whit less important, since their cessation, in the absence of extraneous aid, would speedily have a detrimental effect on the organism. They too are in a sense vital.

Others, again, such as expectoration, are useful, though not indispensable. Some people labour under the disadvantage of being unable to expectorate, but it is not a fatal defect. The function is not universal.

Finally, let us take once more the case of the child.

As he grows up he passes by easy transitions from the voluntary to the automatic stage. He is taught to swim, and swimming soon rivals walking in the unconcern with which the movements are executed; he learns to write, and no less rapidly does the act become one of unconscious familiarity; his games, his exercises, the labour of his hands – be it digging or typewriting – all reach the level of regular automatism; in short, they are functional acts as truly as locomotion or even respiration, with the qualification of being neither essential nor general.

Such examples serve to illustrate the comprehensiveness of the term functional, and embody all the intermediate forms between what is inherently vital and what is purely acquired. When we have to deal in practice with a case of functional disease, discrimination is obligatory from the standpoint of prognosis. We are alarmed at our patient's respiratory embarrassment, not at his impaired caligraphy.

A distinction has also been drawn between *functional* and *professional* affections, profession being conceived as a function of the individual in relation to society. But the latter term has the drawback of being too exclusive. As a matter of fact, scriveners' palsy is met with in people who, so far from being professional writers, do not use the pen much at all. Nor is it necessary to be a professional pianist to develop pianists' cramp. It would be more accurate to speak of disturbances in "occupation acts," it being understood that these have by dint of repetition acquired the automatic characters of true functional acts.

Let us consider for a moment the salient features and component elements in our conception of function.

First and foremost is repetition. It is an absolute law, this of the periodicity of function, and strikingly exemplified in the case of the circulation, digestion, urination, etc. Regularity of rhythm is no less obvious in the muscular activity of mastication, locomotion, and respiration, and its degree seems to be in direct proportion to the duration and vital importance of the particular function.

The characters of this rhythm may be influenced by various extraneous causes. A painful stimulus makes us blink or quickens our respiration. The will may intervene, to accelerate or retard. The personal factor accounts for individual differences, but for each individual a certain rhythm and amplitude of movement, suited exactly to the end in view and conforming to the natural law of least effort, may be regarded as normal. It is only in pathological cases that this law admits of exceptions, and these we shall now proceed to investigate.

Disobedience to the law in the shape of exaggeration or redundance of purposive movement indicates functional excess. For instance, the object of the function of nictitation is to moisten

the conjunctiva. In its evolution the child's unmethodical reaction gives place to the rhythmical automatism of the adult. Perfection is the fruit of education.

But the person whose impetuous and uninterrupted blinking far exceeds the demand of the eye for lubrication is plainly troubled with excess, with "hypertrophy" of function. Herein may consist a tic, and, in fact, a large number of tics are nothing more than functional derangements of this kind.

The execution of a functional act at an inopportune moment constitutes another variety of functional disorder. A smile with no pleasant thought to correspond; a cry, a word, that betoken no precise idea; a gesture to relieve an irritation that does not exist; a chewing movement when the mouth is empty – all are examples of untimely, inappropriate functional acts, which merit the name of tics if in addition they are anomalous as regards rhythm, amplitude, and intensity.

Again, the performance of function is accompanied by antecedent desire and subsequent satisfaction. Authoritative proof of this law is furnished by the case of micturition and of defæcation, although momentary suspension of the function of nictitation or of respiration is also a sufficiently convincing mode of demonstrating its truth. In the case of locomotion and other motor functions a preliminary feeling of need may not be so imperative, but it is none the less constant.

Now, it has been observed already that these are equally conspicuous features in our conception of tic. In so far, then, as the latter is preceded by irresistible impulsion and followed by inordinate content, it may be considered a functional affection.

We cannot, however, dispose of each and every tic as an anomaly of some normal universal function. We have already had occasion to notice a large number of functional acts that are not of general distribution, so-called professional movements, which of course are liable to derangement. Such functional disturbances may be styled professional cramps, spasms, or neuroses; but are they identical with tics?

To attach the majority of them to the tics is, in our opinion, justifiable. They are the clinical expression of abnormalities supervening in a function that has by repetition acquired the automatism of genuine functional acts: they are germane to the tics. In certain points, however, the analogy is not absolute.

Professional cramps are motor phenomena distinguished by arrest of intended movement. Spasm signifies excess of motor reaction, cramp denotes its inhibition. It cannot, then, be said that they present the characteristic features of spasm as we have defined it: they are akin rather to a form of tonic tic of which we shall give instances later.

With this premise, we can identify the professional cramp as a functional anomaly recognisable by defective amplitude and force on the part of the motor reaction. Its most special character is its appearance exclusively during the exercise of the function of which it forms the anomaly. Writers' cramp manifests itself in the act of writing, dancers' cramp during dancing, and so on. We are ready to admit the close affinity of professional cramp to tic, with which it has an additional element in common in its occurrence among the psychically unstable. But, regarded as a tic, it is unique in its dependence on the casual exhibition of the professional act; as long as the telegraphist has no occasion to transmit messages, his occupation cramp will not incommode him in the least.

The great majority of genuine tics, on the other hand, are roused into activity by anything or nothing, and this distinction is fundamental.

With all due recognition, therefore, of the marked resemblances between the two, we shall be well advised in not confounding them under one designation. For want of a better word, we shall use the phrase professional cramp to specify functional disturbances taking place solely during the discharge of professional acts.

One other class remains to be dealt with, consisting of functional acts not merely superfluous but actually prejudicial to him who is at once their creator and their slave. The idea that induced them and the object they have in view are alike irrational.

An individual as he moves his arm one day becomes aware of a cracking feeling in his shoulder-joint, and from the unwonted nature of the sensation emanates the notion that he must have some form of arthritic lesion. Renewal of the gesture is attended with reproduction of the sound. The thought of a possible injury develops and extends until it is an object of constant preoccupation and becomes a fixed idea. Under its malign influence the movement is repeated a hundredfold and with growing violence until it passes into the field of automatic action. It is typically functional in its repetition, in the association of desire and satisfaction; but it originates in an absurd idea, and is actuated by a meaningless motive: its range is exaggerated, its performance irresistible, and its reiteration pernicious. In fact, it is a tic.

We may thus regard tic as an obsolete, anomalous function – a *parasite function*– engendered by some abnormal mental phenomenon, but obeying the immutable law of action and reaction between organ and function, and therefore just as prone to establish itself as any motor act of the physiological order.

CHAPTER IV
THE MENTAL CONDITION OF TIC SUBJECTS

THE existence of psychical abnormalities in the subjects of tics is no new observation. Charcot[18] used to say that tic was a psychical disease in a physical guise, the direct offspring of mental imperfection – an aspect of the question which has been emphasised by Brissaud and by ourselves on more than one occasion.[19]

How is the involuntary and irrational repetition of a voluntary and rational act to be explained? Why is inhibition of a confirmed tic so laborious? It is precisely because its victim cannot obviate the results of his own mental insufficiency. Exercise of the will can check the convulsive movement, but it is unfortunately in will power that the patient is lacking. He shows a peculiar turn of mind and a certain eccentricity of behaviour, indicative of a greater or less degree of instability (Brissaud). Noir writes in much the same strain, that careful examination will readily demonstrate the secondary nature of the motor trouble; behind it a mental defect lurks, which may pass for singularity of character merely, or childish caprice, but which none the less may be the earliest manifestation of fixed ideas and of mania.

It is a matter of some difficulty to describe adequately the features of this mental condition; their extreme variability has its counterpart in the diversity of the motor phenomena. In this polymorphism of psychical defect is justification for the numbering of the tic patient with the vast crowd of degenerates, and indeed Magnan[20] is content to consider tic one of the multitudinous signs of mental degeneration. As a matter of fact, one does find numerous physical and mental stigmata in those who tic, just as one finds them in those who do not.

It therefore becomes desirable to specify in greater detail the mental peculiarities of patients who, by reason of their motor anomalies, form a distinct clinical group both from the neuropathological and from the psychiatrical point of view. The pathogeny of these motor troubles will thus be elucidated and valuable indications for treatment obtained.

Whatever be our theory of tic, whatever be the shape the individual tic assumes, it is in essence always a perturbation of motility, corresponding to a psychical defect. No doubt appearances are deceptive, and the brilliance of the subject's natural gifts may mask his failings. His intelligence may be high, his imagination fertile, his mind apt, alert, and original, and it may require painstaking investigation to reveal shortcomings none the less real. This practice we have scrupulously observed in all the cases that have come under our notice, and we believe that the information gleaned in this way, coupled with the results of previous workers, warrants the attempt at a systematic description of the mental state common to all who tic.

Charcot[21] had already remarked the presence of certain signs or psychical stigmata indicative of degeneration, or of instability, as he preferred to say, inasmuch as the mental anomalies of these so-called degenerates were not only frequently unobtrusive, but in a great many cases associated with intellectual faculties of the first order. His contention has been amplified by Ballet:[22]

The striking feature of these "superior degenerates" or "unstables" it not the insufficiency, but the inequality, of their mental development. Their aptitude for art, literature, poetry, less often for science, is sometimes remarkable; they may fill a prominent place in society; many are men of talent,

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[18] CHARCOT, *Leçons du mardi*, 1887-8, p. 124.

[19] *Communication faite au Congrès de Limoges*, August, 1901; *Soc. de neur. de Paris*, April 18, 1901; *Gazette des hôpitaux*, June 20, 1901, p. 673; *Progrès médical*, Sept. 7, 1901, p. 146.

[20] MAGNAN, *Recherches sur les centres nerveux*, 2nd series, p. 116.

[21] CHARCOT, *Leçons du mardi*, October 23, 1888.

[22] BALLET, *Traité de médecine*, vol. vi. p. 1158.

some even of genius; yet what surprises is the embryonic condition of one or other of their faculties. Brilliance of memory or of conversational gifts may be counteracted by absolute lack of judgment; solidity of intellect may be neutralised by more or less complete absence of moral sense.

In the category of "superior degenerates" – to use Ballet's terminology – will be found the vast majority of sufferers from tic, of whom O. may serve for the model. A no less instructive example is that of J.:

Of superior intelligence, lively disposition, and ingenious turn of mind, J. is dowered with unusual capabilities for assimilation. Everything comes easy to him. At school he was one of the foremost pupils, and his work elicited only expressions of praise. He is both musical and poetical; his quickness and neatness of hand find outlet in his passion for electricity and photography; for mathematics alone he has little inclination.

In a word, as with physical imperfection, so with mental – it may consist either in absence, arrest, or delay, or in overgrowth, increase, exaggeration, and these contrary processes may co-exist in the same individual. Sufficient stress, however, has not been laid on a practically constant feature in the character of the *tiqueur*– viz. his *mental infantilism*, evidenced, as was noted by Itard in 1825, by inconsequence of ideas and fickleness of mind, reminiscent of early youth and unaltered with the attainment of years of discretion. We must remember that imperfection of mental equilibrium is normal in the child, and that perfection comes with adolescence. In the infant cortico-spinal anastomoses are awanting, and volitional power is dependent on their establishment and development. At first, cortical intervention is inharmonious and unequal: the child is vacillating and volatile; he is a creature of sudden desire and transient caprice; he turns lightly from one interest to another, and is incapable of sustained effort; at once timid and rash, artless and obstinate, he laughs or cries on the least provocation; his loves and his hates are alike unbounded.

These traits in the child's character pertain equally to the patient with tic, in whom retarded or arrested development of volition, physical and mental evolution otherwise being normal, is the principal cause of faulty mental balance. That this view is correct may be inferred from a comparison of the individual patient with healthy subjects of his own age. The chief element in mental infantilism is maldevelopment of the will. While in the child deficiency of what one might call mental ballast is usually atoned for by well-conceived discipline and education, it is accentuated by misdirected teaching. Now, it not infrequently happens that the upbringing of the predisposed to tic is not all that might be desired, seeing that mental defect on the part of the parents renders them unsuitable as instructors of youth. Parental indulgence or injustice is the fertile source of ill-bred or spoiled children, in whom, spite of years, persist the mental peculiarities proper to childhood. From the ranks of these spoiled children is recruited the company of those who tic, for tics, generally speaking, are nothing more than bad habits, which, in the absence of all restraining influence, negligence and weakness on the side of the parents have allowed to degenerate into veritable infirmities. These the patients themselves are incapable of inhibiting, for whatever be their age, they remain "big children," badly bred and capricious, and ignorant of any self-control. Hence one of the first indications in their treatment is to submit them to a firm psychical discipline, calculated specially to strengthen their hold over their voluntary acts. Take the following case:

J. is nineteen years old, intelligent, educated, ready to graduate were it not for the interruptions his studies have undergone, and to all appearance arrived at manhood's estate. None the less he presents to-day the mental condition of nine years ago: he is fickle, pusillanimous, naïve, emotional; he laughs at trifles and is provoked to tears at the first harsh word; his nature is restless, his mind inconsequential; he is by turns elated or depressed for the most trivial of reasons. Notwithstanding his seventy-one inches, he must still be fed, dressed, and put to bed by his mother!

An identical mental state obtains in infantilism, properly so called, where to arrest of mental development physical imperfection is superadded. In cases of infantilism the psychical level corresponds more or less intimately to the somatic level, an observation borne out in the case of J.:

From the morphological point of view he shows one or two stigmata of infantilism: his great height need not be held to disprove this, for gigantism and retardation of sexual development are often in association. In spite of his nineteen years, J. has still a eunuch's voice and a minimum of axillary and pubic hair – in fact, one might say that physically he is thirteen years old, and mentally ten.

Or take Mademoiselle R., aged twenty-six:

Her intellectual attainments are those of a child of twelve, her age when her first tics made their appearance. Her artlessness and timidity are simply childish, and at the same time she lacks womanly charm and feminine ways.

Or again:

Young thirteen-year-old M. has been afflicted with tics of face, head, and shoulders for the last three years. Though small, he is well enough built, and has no obvious physical anomaly except an odd admixture of blonde and brown in his hair and eyebrows. His teeth are bad and misplaced, and several of the first dentition persist. There is no sign of pubic or axillary growth. As a general rule he is mild-mannered and docile; sometimes, however, he is irritable, impatient, emotional beyond his years. His degree of intelligence is very fair, but idleness and inconstancy are prominent traits in his character. The ease with which he apprehends is counterbalanced by the readiness with which he forgets, while his reason and judgment are those of a child of seven. The discordance between his actual age and his mental standard is therefore striking enough.

Another of our patients is L.:

Her intellect is quite up to the average, but the exaggerated importance attached by her parents to her "nervous movements" has only served to intensify her whims. Her eighteen years do not prevent her from revealing signs of mental infantilism in every action of her daily life, but, thanks to suitable treatment, she has been astonishing her father by unheard-of audacities – has she not recently ventured to cross the street alone, and alone to go an errand to a neighbouring shop?

X. has a tic of the eyes and has reached the age of forty-eight, yet he told us he was not so much his children's father as their playmate. At the age of fifty-four O. could still remark on his youthfulness of character. The same is true of S., who has attained his thirty-eighth year.

It is as arduous a task to define the term "stability of the will," as it is to explain what is meant by physical or mental health. But as it is not essential to preface descriptions of disease with a disquisition on the signs of good health, so anomalies of voluntary activity may surely be noted without a preliminary excursus on normal volition.

Will power may deviate from the normal in either of two directions – in the direction of excess or of insufficiency. To both of these two forms of volitional disturbance the subjects of tic have become slaves. Weakness of will is seen in irresoluteness of mind, flight of ideas, want of perseverance; exuberance of will in sudden vagary or imperious caprice. The man who tics has both the debility and the impulsiveness of the child; to his impatience his incapacity for sustained effort acts as a set-off; he is impressionable, wavering, thoughtless, even as he is mettlesome and irascible. He does not know how to will; he wills too much or too little, too quickly, too restrictedly.

As a single example of volitional activity, let us take the attention. Diminution of attention on the part of tic patients has been judiciously commented on by Guinon:

It is impossible for them to address themselves to any subject: they skip unceasingly from one idea to another, and apply themselves with zest to some occupation only to forget it immediately. No further proof of this need be sought than the inability of the patient, if he be at all severely affected, to read, a proceeding at once intellectual and mechanical, and absolutely familiar to most. Read the patient cannot, and though the attempt to concentrate the attention diminishes or inhibits the tic at once, there is no sequence in his effort; his eye jumps erratically from one line to another, and his many unavailing trials end in his throwing the book away.

Excess of voluntary activity is disclosed in the whole series of impulsions.

The germ of homicidal or suicidal tendencies, which we have indicated in the case of O., is discoverable also in one of Charcot's patients.[23]

M. Charcot (to the patient) – Tell us what you said the other day about razors.

The Patient– Whenever I see a razor or a knife, I begin to thrill and feel afraid. I imagine I am going to kill some one, or that some one is going to kill me. I have the same sensation when I see a gun, or even if the notion of a gun comes to my mind. The mere thought of it agonises me. The fancy of murdering some one strikes me, and up to a certain point I am envious of fulfilling the desire. Often I am conscious of an irresistible longing to fight somebody, and I am frequently impelled to it by the sight of a cabman. Why a cabman more than any one else, I have not the remotest idea.

We have already touched on the close affinity between an act and the idea of the act, and we have emphasised the absence of any appreciable interval between the idea and its execution, unless the brake of volitional interference be put on at the proper moment. It is in these circumstances that the feeble of will betray their debility; the inadequateness or inopportuneness of their will's activity allows the performance of the act they would fain repress.

A no less characteristic feature of the subject of tic is his impatience.

J. bolts his food without waiting to masticate it, and the instant his plate is empty jumps up from the table to walk about the house. He returns for the next course, which he swallows as precipitately; delay makes him impatient, and all are forced to rush as he does. Meal time for the whole family has become a perfect punishment. Alarmed enough already at his tics, the parents are terror-stricken by the tyrannical caprices of this big baby, who outvies the worst of spoilt children in his behaviour.

Mental instability is not uncommonly associated with a general restlessness and fidgetiness during intervals of respite from the actual tics. The patient experiences a singular difficulty in maintaining repose. Every minute he is moving his finger, his foot, his arm, his head. He passes his hand over his forehead, runs his fingers through his hair, rubs his eyes or his lips, ruffles his clothes, plays with his handkerchief or with anything within reach, crosses and uncrosses his legs, etc. None of these gestures can properly be considered a tic, for, however frequent be its repetition, it is neither inevitable nor invariable. If they are superfluous and out of place, the absence of exaggeration or absurdity negatives their classification as choreic. They are a sign not so much of motor hyperactivity as of volitional inactivity. They are tics in embryo.

The patient's emotions are similarly ill balanced. Any rearrangement in his habits he finds disconcerting; he is upset by an unexpected word, a deed, a look; his timidity and sensitiveness are extreme – fertile soil for the development of tics.

So, too, with his affections, his likes and dislikes, his friendships and enmities – there is commonly a disproportion about them that betokens mental deficiency. At one time it is fear or repulsion that actuates him; at another it is an unnatural tenderness, a sort of *philia*, if the term may be allowed.

Anomalies such as these, however, are met with in all the mentally unstable, and do not present any special feature when they occur in those who tic.

An acquaintance with the mental state of our patients enables us to understand the mode their tic adopts. As one thinks, so does one tic. To the transiency and mutability of the child's ideas correspond what are known as variable tics, which rarely have a definite localisation, and become fixed only when certain ideas become preponderant. The existence of a solitary tic, however, is not at variance with that disposition we have qualified as infantile, for mental infantilism is the original stock; on it, as a matter of fact, may be grafted further mental disorders in the shape of fixed ideas, phobias, or obsessions.

Should a fixed idea entail a motor reaction, it may give rise to a tic as ineradicable as the idea itself, and a series of fixed ideas may be accompanied by a succession of corresponding tics.

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[23] CHARCOT, *Leçons du mardi*, October 23, 1889.

The frequency with which obsessions, or at least a proclivity for them, and tics are associated, cannot be a simple coincidence. Without defining the word obsession, let us be content to recall the excellent classification given by Régis, according to whom they mark a flaw in voluntary power, either of inhibition or of action. On the one hand we have *impulsive obsessions*, subdivided into obsessions of indecision, such as ordinary *folie du doute*; of fear, such as agoraphobia; of propensity, such as those of suicide or homicide. On the other we find the *aboulic obsessions*, such as inability to stand up (ananastasia), or to climb up (ananabasia), or the astasia-abasia of Séglas, or the akathisia of Haskowec. Perhaps we ought also to place here sensory obsessions in the shape of topoalgia, and even hallucinatory affections.

In all these varieties of obsession increase or diminution of volitional activity is undeniable. But this alteration in the function of the will is no less distinctive of tic, and if we compare the psychical stigmata of obsessional patients – the asymmetry of their mental development, their intellectual inequalities and lack of harmony, their alternating excitability and depression, their unconventionalities, eccentricities, and imaginativeness, their timidity, whimsicalness, sensitiveness, and all the other indications of a psychopathic constitution – if these are compared with the mental equipment of the sufferer from tic, we cannot but notice intimate analogies between the two, analogies corroborated by a glance at their symptomatology.

An obsession may be of idiopathic origin, or it may be causally connected with some particular incident, sensation, or emotion. A conflagration may determine fear of fire, or a carriage accident amaxophobia. Further, the obsession is irresistible, as is the tic: opposition endures but for a moment, and is therefore vain. Nor is the inhibitory value of attention or distraction any less ephemeral. This feature of tic was noted as long ago as 1850 by Roth, who held its motor manifestations to be phenomena of "irresistible musculation."

Consciousness is maintained in its integrity both before and after, but not during, an obsessional attack, and this is equally true of tic, as are the preliminary discomfort and subsequent satisfaction that attend the obsession. Noir makes the appropriate remark that idiots affected with krouomania, in whom sensory disturbance is awanting, so far from suffering pain through sundry self-inflicted blows and mutilations, seem, on the contrary, to be thus afforded a certain feeling of relief, if not of actual relish.

Whenever Lam., who exhibits incessant balancing and rotatory movements of the head, is seated in proximity to a wall, he knocks his head sideways against it until a bruise results, and appears to find therein a source of genuine satisfaction.[24]

If, then, an obsession provokes a motor reaction at all, it may originate a tic, and, in the case of tonic tics, this is a very common mode of derivation, as one may well understand how an obsession may occasion an attitude.

Grasset cites the example of a young girl who would never lean backwards in a railway carriage or on any chair or bench, preferring to sit bolt upright on the edge. In this instance the adoption of a stereotyped attitude was directly attributable to an obsession.

Another example of an attitude tic is furnished by the case of young J.:

Standing or seated, he always has his half-flexed left arm firmly pressed against the body in the position assumed by hemiplegics. Its pose and inertia and the awkwardness of its movements unite to suggest some real affection, the existence of which the constant use of the right arm and the elaboration by the patient of intricate devices to obviate disturbing the other tend to substantiate. Nevertheless, the impotence is entirely imaginary. To order he can execute any movement of the left arm with energy and accuracy; his left hand will button or unbutton his clothes, lace his boot, handle a knife, and even hold a pen and write.

[24] NOIR, *Thèse de Paris*, obs. xviii. p. 40.

It seems that the position of the arm was chosen deliberately to alleviate a supposed pain in the shoulder, and unceasing resort to this subterfuge of his own inventing, which he considered a sovereign remedy, ended in its voluntary adoption being succeeded by its automatic reproduction.

The assumption of this position for his arm was at first attended with satisfactory results, but, as might have been foreseen, its inhibitory value decreased gradually, so he had recourse to other means. It was then that the right hand was made to grip the left and press it more energetically than ever against the epigastrium. In this complex attitude both arms simultaneously participated, but again its efficacy was purely transitory. Evidently dissatisfied with his methods of immobilisation, and convinced that experimentation would end in the discovery of the desired arrangement, J. proceeded to employ the right hand in impressing every variety of passive movement on the left hand, wrist, forearm, and upper arm, and soon there was no checking these gymnastic exercises. He would suddenly grasp the wrist and pull and screw it, while the left shoulder and elbow resisted nobly; or he would bend, or unbend, or twist his fingers, or seize the arm below the axilla and knead it or rub it, forcing it against or away from the thorax; he would pound the muscles and pinch the tendons, sometimes in a brutal fashion; in short, the situation degenerated into nothing more nor less than a pitched battle between the left arm and the right hand, in which the latter endeavoured by a thousand tricks to bring the former into subjection. Victory rested always with the affected arm.

Each time that this absurd combat recommenced, the patient experienced a sensation of relief; resignation to the imperious motor obsession was even followed by a sense of well-being. On the other hand, resistance was accompanied by actual anguish – he would fidget desperately in his chair, cross and uncross his legs, sigh, grimace, rub his eyes, bite his lips and nails, twist his mouth about, pull at his hair or his moustache, he would look anxious or alarmed, would become by turns red or pale, and beads of perspiration would gather on his face. At length he would be compelled to yield, and the bloodless battle of his upper limbs would close more furiously than ever.

In this case the typical features of obsession are excellently illustrated – its irresistibility, as well as the concomitant distress and succeeding content.

Conversely, however, a tic may be said to develop into an obsession if the exciting cause of the latter be the motor reaction.

In various psychopathic conditions (says Dupré[25]), especially where the genito-urinary apparatus is concerned, this pathogenic mechanism is encountered. Some source of peripheral irritation in bladder, urethra, prostate, etc., provokes cortical reaction, and a reflex arc is established with centrifugal manifestations in the guise of motor phenomena, which in their turn originate all sorts of fixed ideas, impulsions, and obsessions, forming an integral part of the syndrome.

There is frequently no direct or obvious connection between a patient's obsession or obsessions and his tics. The former may consist, both in children and in adults, in extraordinary scrupulousness, perpetual fear of doing wrong, absolute lack of self-confidence, sometimes simply in excessive timidity, exaggerated daintiness, or interminable hesitation. We have often seen youthful subjects betray in their disposition weak elements such as the above, which at a later stage have proved the starting-point for more definite obsessions. Their intelligence and capacity for work earn the approbation of their teacher, yet they are for ever dissatisfied, haunted by the dread of having overlooked some iota in their task; they dare not affirm that they know their lessons, they stammer over their answers, mistrust their memory, make no promises and take no pledges, and thus bear witness to an absence of confidence in themselves which affects them profoundly, for they are well enough aware of its consequences.

An admirable instance of this is furnished by the case of young F., or by little G., ten years old, who suffers from a facial tic, and constantly hesitates when asked to give a measurement, an hour, a date, a figure, solely by reason of a conscientious fear of not being absolutely accurate in his reply.

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[25] DUPRÉ, *Soc. de neur. de Paris*, April 18, 1901.

In children the emotional excitement of their first Communion often favours the development of religious scruples. By a sort of metastasis, diminution of the convulsive movements goes *pari passu* with aggravation of the mental phenomena, until such a time as the devotional exercises are done with, when there is a return to the previous state.

Arithmomania betokens an analogous turn of mind. Certain patients are compelled to count up to some number before performing any act. One cannot rise from his seat without counting one, two, three, four, five, seven, leaving out six since it is disagreeable to him. Another must repeat the same movement two, three, ten times, must turn the door-handle ten times ere opening it, must take five steps in a circle before beginning to walk (Guinon). A patient of Charcot's used insanely to count one, two, three, four, used to look under his bed three or four times, and could not lie down until assured that his door was bolted. A further example is reported by Dubois:

A young woman twenty years of age first began to suffer from convulsive tics five years ago. Without any warning she used to bend down as if with the intention of picking up something, but she had to touch the ground with the back of her hand, else the performance was repeated. Twenty or thirty times a day this act was gone through; in the intervals she kept turning her head to the right, looking up at the curtains in a corner of the window, and at the same time making a low clucking sound that attracted the attention of those in the room. For nine or ten years these two tics have prevailed, and have been accompanied with certain obsessions, such as the impulse to count up to three, to regard any person or object three times, etc. With the generalisation of the convulsive movements various phobias have made their appearance – viz. fear of horned animals, of earthworms, of cats, of blight, etc.

Onomatomania is another form of obsession which may be mentioned, exemplified by the dread of uttering some forbidden word, or by the impulse to intercalate some other. The term *folie du pourquoi* has been applied to the irresistible habit of some to unearth an explanation for the most commonplace of facts: "Why has this coat six buttons?" "Why is so-and-so blonde?" "Why is Paris on the Seine?" etc. This mode of obsession is frequent among those who tic, and is curiously reminiscent of a familiar trait in the character of children, thereby supporting our contention of the mental infantilism of all affected with tics.

Prominent among the mental anomalies of the subjects of tic are found different sorts of phobia: fear of death or of sickness, of water, knives, firearms – topophobia, agoraphobia, claustrophobia, etc.

The following most instructive case has been observed by one of us over a period of several months:

S.'s earliest attack of torticollis, of two or three days' duration merely, occurred when he was fifteen years old, and was attributed by his mother – whose mental peculiarities, in especial her fear of draughts, are no less salient than those of her son – to a chill occasioned by a flake of snow falling on his neck. S. is so blindly submissive that he accepts this pathogeny without reserve. Five years ago a second torticollis supervened, which still persists to-day, and of which his explanation is that he was obliged, when standing at a desk, to turn his head constantly to the left for two hours at a time in order to see the figures that he had to copy, and was forced, after the elapse of some months, to relinquish his work owing to pain in the occipital region and neck. From that moment dates the rotation of his head to the left.

At the present time his head is turned to the left to the maximum extent, the homolateral shoulder is elevated somewhat, and the trunk itself inclines a little in the same direction. The permanent nature of this attitude necessitates his rotating through a quarter of a circle on his own axis if he wishes to look to the right. On the latter side the sternomastoid stands out very prominently, and effectually prevents his bringing the head round; nevertheless he is greatly apprehensive of this happening, and as he walks along a pavement with houses on his right he keeps edging away from them, since he is afraid of knocking himself against them. By a curious inversion, common enough

in this class of phobia, he feels himself impelled to approach, with the result that he cannons against the wall on his right as he proceeds.

Contrary to the habit some patients with mental torticollis have of endeavouring to ameliorate the vicious position by the aid of high starched collars, S. has progressively reduced the height of his until he has finished by discarding them altogether. As a matter of fact, it is the "swelling" in the neck caused by the right sternomastoid that is at the root of his nervousness, for he is convinced that it preceded the onset of the torticollis, and he has a mortal dread of aggravating it by compression.

Hence one may perhaps understand what line of erroneous reasoning has led to the establishment of the wryneck. The fear of draughts, instilled in his youthful mind by his mother, had the effect of driving him to half-strangle himself with a tightly drawn neckerchief, to hinder the inlet of air and minimise the risk of catching cold, and when he commenced to turn his head to the left at his work, the pressure of the band round his neck was felt most of all on the contracted right sternomastoid. A glance at a mirror convinced him that the unusual sensation was due to an abnormal muscular "swelling," whereat he was vastly alarmed; he hastened to change his collar, but all to no purpose. By dint of feverish examination and palpation of the muscle, he soon acquired the habit of contracting it in season and out of season, till at length an unmistakable mental torticollis supervened.

It sufficed to explain to S. the role played by the sternomastoid in head rotation, and to demonstrate the absurdity of his interpretation of the so-called "swelling": the gradual relaxation of the muscle and consequent diminution in the "tumour's" size not only satisfied him of its benign nature, but afforded such a sense of relief as was quickly made obvious by a notable improvement in his condition.

A singular tic of genuflexion occurred in a case reported by Oddo, of Marseilles:

The dominant note in the young girl's character is her cowardice; she is afraid of everything. Every evening before the return of her father she repeatedly looks into the corridor to see that no one is there; as soon as her parent arrives, she locks the door behind him hurriedly to prevent any one else appearing; every now and then in her fear of a footstep she listens at the door, and it is this gesture, this attitude of listening, that has degenerated into a tic which no amount of remonstrance or derision seems to affect.

Phobias such as these are associated with an evident tendency to melancholia and hypochondriasis. The majority of our patients are ridiculously preoccupied with the state of their health; the extraordinarily introspective nature of their minds is manifest in their meticulous observation, their laborious analysis of their most trifling sensations, the zeal with which they devise the most complex explanation for their simplest symptom, usually for the sake of making the prognosis seem more grave.

Конец ознакомительного фрагмента.