

Medicine, University College, Ibadan, for permission to publish these cases. I thank Drs. Hans Neudecker and Willy Bernhard, of the Universities of Innsbruck and Frankfurt respectively, and both of the Catholic Mission Hospital, Abeokuta, for their invaluable help and for the great effort made not only to obtain most of the foreign literature on the subject but to discuss and evaluate these cases with me from time to time. They also took photographic illustrations and cine-films of the cases described for Aro Hospital clinical record section. I acknowledge with thanks the helpful criticism and comments made by Professor D. E. Denny-Brown, Department of Neurology, Harvard University, U.S.A., who read the original draft.

## REFERENCES

- Blandy, M. A. (1920). *J. Neurol. Psychopath.*, **1**, 148.  
 Brain, R. (1955). *Diseases of the Nervous System*. Oxford Univ. Press, London.  
 Campbell, C. M., and Morse, M. E. (1924). *J. Neurol. Psychopath.*, **5**, 28.  
 Denny-Brown, D. E. (1946). *Diseases of the Basal Ganglia and Subthalamic Nuclei*. London.  
 Guttmann, E. (1936). *J. Neurol. Psychopath.*, **17**, 16.  
 Kehr, F. A. (1928). *Erblichkeit und Nervenleiden*. Berlin.  
 Meyer, A., and Cook, L. C. (1936). *J. Neurol. Psychopath.*, **16**, 341.  
 Purves-Stewart, J., and Worster-Drought, C. (1952). *The Diagnosis of Nervous Diseases*, 10th ed. London.  
 Reese, H. H. (1946). *Yearbook of Neurology and Psychiatry*, p. 201. Chicago.  
 Schwalbe, M. W. (1908). *Eine eigentümliche tonische Krampfform mit hysterischen Symptomen*. Berlin.  
 Strümpell, A. (1898). *Dtsch. Z. Nervenheilk.*, **12**, 115.  
 — (1913). *Neurol. Zbl.*, **33**, 1303.  
 Taylor, E. W. (1920). *Arch. Neurol. Psychiat. (Chicago)*, **4**, 417.  
 Thomalla, C. (1918). *Z. ges. Neurol. Psychiat.*, **41**, 311.  
 Wechsler, I. S. (1947). *Textbook of Clinical Neurology*, 6th ed. London and Philadelphia.  
 Wimmer, A. (1921). *Rev. neurol. (Paris)*, **28**, 952.  
 Ziehen (1911). *Neurol. Zbl.*, **31**, 109.

## TREATMENT OF A CASE OF COMPULSIVE SWEARING

BY

**RICHARD P. MICHAEL,\* M.B., B.S., D.P.M.**

*Registrar, the Maudsley Hospital, London*

Coprolalia as a symptom occurs in the major psychoses leading to personality deterioration and disintegration. Compulsive utterances of an obscene nature are, however, an unusual occurrence where the personality remains intact, and generally form part of a wider clinical syndrome originally described by Itard (1825), mentioned by Trousseau (1867), and delineated by Gilles de la Tourette in 1885. The essential features of the syndrome now bearing the latter's name include a childhood onset with multiple motor tics, a vocal tic developing later into vulgar utterances, and sometimes also a compulsion to repeat both the words and the actions of others. Frequently the motor component is impulsive and very bizarre, bearing a relationship to the *latah* which used to be seen in the Malay peninsula (O'Brien, 1883). But it is usually the uncontrolled audible obscenities that force the sufferer into an increasing social isolation, providing, some writers feel, the basis for an eventual psychotic withdrawal.

These uncommon cases are acknowledged to be extremely difficult to treat; the lack of success may be judged from the multiplicity of remedies tried. The physical restraint, isolation, skimmed-milk baths, and static-electricity treatments of an earlier era have given place to modern psychotherapeutic procedures, yet there are few well-authenticated cases in the literature that have lost their tics. None of the patients of Gilles de la Tourette, five of whom were followed over some years, showed any sustained improvement. Itard's old woman, who was seen by Charcot, began ticking as a child of 7 and died at 85, still pouring forth the grossest obscenities. Guinon (1886) and the other older writers

\*Holder of a Medical Research Council Fellowship in Clinical Research.

(Prince, 1906; Gilles de la Tourette, 1899) were uniformly gloomy upon the likelihood of recovery. Kinnier Wilson (1955) gives the syndrome a sinister outlook, characteristically "ending in insanity," and though accurate information on prognosis is sparse most authorities describe a progressive worsening of symptoms. One of the three cases collected by Ascher (1949) from the Phipps Clinic developed schizophrenia; while his two personal cases did not improve with psychotherapy. Of Heuscher's (1953) three cases one also became schizophrenic. Mahler and Rangell (1943) had a boy of 11 under continuous psychotherapy for 30 months, and agreed with the previous authorities that the prognosis was unfavourable.

The following case is described because of the satisfactory response to therapy.

### Case Report

A salesman aged 28 was admitted to hospital on June 11, 1954, and discharged on November 26, 1954.

His father, aged 61, was healthy, a printer in charge of a composing department. He was a quiet man, even-tempered, and somewhat ineffectual, who made few demands on the family. The mother, aged 56, was also healthy, but house-proud, hot-tempered, strong-willed, and close to the patient. There was one healthy married sister aged 24. There were no familial illnesses and no history of chorea or tics.

### Personal History

The patient's birth on August 2, 1926, was normal, but he was over one month premature and under weight. There were initial feeding difficulties, and the frenulum of the tongue required freeing at 2 weeks. He was concussed at 2, had measles and chicken-pox at 2½, and pneumonia at 4. (These incidents are mentioned because of the possible aetiological importance of brain damage.) Though his speech was retarded the other milestones were normal. A timid shy child with temper tantrums, night terrors, and many minor compulsive rituals, he attended elementary school at 5, secondary school at 12, leaving at 14½ to work in the father's print-shop for two years before becoming a hat salesman. At 18 he was called up for the Army (B1) and served for two years in Egypt before being discharged with the rank of sergeant at the age of 22. He then joined his present firm and has since risen progressively to the position of a senior salesman who covers an important territory.

Play with his sister and other children continued normally until the age of 9, but from that time on he made attachments with boys only. Masturbation began before 15 and continues. At 18, when in the Army, he became the active partner in anal intercourse, and his relationships have remained exclusively homosexual. There is a well-marked madonna-prostitute split in his love objects. There are those men whom he admires and feels love for and also, as he says, the casual pick-ups with whom he has intercourse. Always a good worker, he is money-conscious, ambitious, and successful, yet anxious and tied to the home. Both selfish and sensitive, his manner is ingratiating with superiors, for he is afraid of "the big man in business."

### Present Illness

At the age of 7 he developed tics originally thought to be St. Vitus's dance but later diagnosed at Great Ormond Street as habit spasms. The wriggling of his body, facial contortions, and sensitivity to noise subsided gradually over the next two years. But at 9 he began making noises, and these soon developed into the swearing which persisted with such distress to his family until he was 13. Reading *Tom Sawyer* made a deep impression on him and he began to say "huckleberry fuckleberry fuck fuck." He was reported to his teacher for using "dirty words" and scolded severely at home, but the pronouncements had developed an

involuntary, repetitive, explosive quality and, despite everything, persisted. He was symptom-free while in the Army, but at 22 some noises reappeared in the form of a vocal tic, resembling a hiccup, which he found difficult to suppress. At 23 he felt a compelling urge to swear along with the noise, and six months later began to do so. A short crow was made by a sharp Valsalva manoeuvre with first the sound "uck" and later the word "fuck" superimposed. Simultaneously there would be a violent jerk of the head, arms, and eyes, almost seizure-like, resembling rather a Moro reflex and giving him a strikingly infantile appearance. Though slowly increasing in severity his symptoms had been present four and a half years.

In the few months prior to admission the exclamation "shit" had been added to the original one. The frequency of utterance was by then from 10 to 40 an hour. He was usually free for half an hour on awakening, and at his best when alone and occupied by some task. He was regularly worse at home in the evenings, in the time before his father's return from work, when the family learned to anticipate a regular barrage. Attempts at suppression led to tremendously increased tension and subsequently an increased discharge. These exclamations occur whether he is silent or speaking, but he is free from them during sleep and they have never invaded his writing. It eventually became quite impossible for him to suppress or disguise the convulsion and noise even when conversing with clients. He was obliged to stop working, and for the first occasion sought help. By this time both his mother and his sister were refusing to accompany him out of the house, and it had become impossible for him to ride upon a bus or visit a restaurant or a cinema because of the volume and frequency of his utterances. He was becoming a recluse, professionally disabled and virtually unable to leave the home.

#### Investigations

He was of somewhat boyish appearance with prominent eyes, but general physical and neurological examination revealed no abnormality, though the symptom was very much in evidence. He was co-operative and friendly, admitting to several minor compulsive rituals and showing a tendency to both echolalia and pallialia. Orientation was perfect, he was not depressed, and there were no delusions or hallucinations. Memory and attention were normal, there was good superficial insight, and he was observed to be symptom-free during sleep.

The blood count, W.R., B.M.R., and chest film were all normal. The E.E.G. was within normal limits, there was no change with overbreathing, and the responses to photic stimulation were regular and symmetrical. There were no paroxysmal features and no evidence of a focal lesion. The record was repeated with bilateral sphenoidal electrodes and intravenous thiopentone without revealing any abnormality. Psychological testing failed to reveal any dysfunction in the verbal sphere, his vocabulary was average, and the Wechsler gave a full-scale I.Q. of 114. An attempt was made to observe and count his tics, using cinephotography and an electromyograph and then time-sampling the film. He was then interviewed and the tics were counted while supposedly stressful and neutral material was discussed with him. No detectable change in the rate, intensity, or form of his tics and respiratory grunts was observed.

#### Treatment and Outcome

On June 25 psycho-analytically orientated psychotherapy, in 50-minute sessions four times a week, was begun under the supervision of Dr. Kräupl-Taylor. It had been decided that the immediate aim of our treatment was to attempt to alter the form of the compulsive utterance and restore the patient as rapidly as possible to social life, despite a residual respiratory tic which in itself might perhaps not have been crippling and for which there was possibly an organic basis. No attempt was made to treat his inversion. He was unable to give up any defences and could never free-associate. Little progress was made and no alteration in the frequency or content of the vocal tic had been observed after 40 inter-

views. Carbon dioxide treatment (70% CO<sub>2</sub>) was then begun and carried out four times a week. While apparently still inaccessible he quite frequently made the most striking and violent sucking movements, and those dreams that he was able to recall afterwards were full of obvious phallic imagery.

In the following weeks a gradual decrease in tension ensued, and a lessening in the frequency of the utterances was both reported subjectively by the patient and noted in the record maintained by the nursing staff. He received 30 treatments, increasingly spaced out, over a period of two months and was discharged from hospital, having been shown before a hospital conference, on November 26. The coprolalia had disappeared, so had the muscular tic. He retained an inconspicuous vocal tic, resembling a soft hiccup, occurring three or four times a day, but this could be controlled and cleverly concealed. He became apprehensive when due to leave hospital, and received chlorpromazine, 25 mg. twice daily, in the 10 days before and after discharge.

He has now been working for 15 months with no further treatment and is leading the life of a busy and successful sales representative. He is relaxed and at ease in interviews, in itself a striking change, and only an observer familiar with this case could detect the vocal tic. "It is better than it has ever been, but I am not without the desire or the occasional noise." Some sort of sound is made three or four times a day, concealed in a stutter or slight hesitation in his speech. He has just completed, as he himself says, "a successful and profitable 4,000-mile trip for the company."

#### Discussion

This case appears to be a good example of the Gilles de la Tourette syndrome, showing the childhood onset with multiple tics and coprolalia, a latent period, and the return in adult life of a convulsive muscular tic, a vocal tic with at first "mental" and later again actual coprolalia. Though never showing echopraxia, there were pallialic and echolalic features; he developed, for example, the compulsion to shout repeatedly the name of another patient in the ward who had at one time made fun of his disability. The psychotherapeutic approach was fruitless. Heuser (1953) suggested that the difficulty and danger of this approach rests in the role of the tic as the last "desperate defence against psychosis." Mahler and Luke's (1946) view and that of Mahler, Luke, and Daltroff (1945) were somewhat similar: of nine children followed up by them, though mostly still in their teens, two had already become psychotic. They viewed the adolescent condition as an organ neurosis only indirectly accessible to psychotherapy, and concluded that there was no direct correlation between recovery and the length of treatment or psychotherapeutic method tried. Weisman (1952) has dealt along psycho-analytic lines with respiratory tics in adults, which he also regarded as a defence against something worse. Unfortunately, he gave no clear indication of the outcome.

The aetiology of the syndrome is probably multiple and is imperfectly understood. There is a prevalent feeling that a substratum of organic brain damage exists upon which psychodynamic factors can operate, determining the form that the tics and utterances take. Though it remains difficult to separate tics from motor compulsions (Abraham, 1921), and whatever the symbolic meaning of the former, whether regarded as a pre-genital conversion or not, there is no problem here. In this case the patient largely abandons symbols and informs us quite overtly what he means by his choice of hostile and "dirty" words.

The coincidence in time between the CO<sub>2</sub> treatments and the amelioration of symptoms of 4½ years' standing was dramatic. But it is quite impossible to exclude the possibility of spontaneous improvement, particularly in a condition where the intensity of symptoms is known to fluctuate. It was seen that, during a period of relatively successful sexual adjustment (when in the Army), he had been symptom-free. If we assume that the change was not merely a chance one, for CO<sub>2</sub> inhalations to precipitate a 15-months

remission is interesting. This improvement appears to have continued of its own accord, and the occasional out-patient "maintenance" treatment which had been envisaged has been unnecessary. This simple decrease and disappearance of symptoms, as Meduna (1953) has indicated, is seen quite as often as a cathartic emotional release, which did not occur in this case.

Suppose there did exist in the genesis of these tics and this repetitive speech disturbance a self-perpetuating process by which the muscular and vocal discharges themselves provide the stimulus for a further discharge. In these circumstances a manœuvre designed to interrupt this process, by lowering the excitability of the system, then seems less empirical than it first appears. After inhalation of CO<sub>2</sub> the disturbance in the plasma hydrogen-ion concentration is very considerable (pH 7.2→6.7—A. Bartholomew, personal communication). Adrian (1930) noted that the hyperexcitability and spontaneous firing in peripheral nerve preparations was prevented by transfer to an atmosphere of 5% CO<sub>2</sub>, and Lorente de Nó (1947) has shown that a similar concentration of CO<sub>2</sub> raises the demarcation potential (4 millivolts, approximately 60%) and also the threshold for stimulation in peripheral nerve.

It is, of course, not possible to argue directly from results obtained in isolated amphibian core conductors when attempting to understand phenomena in the multisynaptic systems which must be concerned in the reverberating neuronal networks that are postulated in higher mammals (Ashby, 1952): though there is evidence that the synapse is the more sensitive to changes in hydrogen-ion concentration (Eccles, 1953). Speculation on the mode of action of any apparently successful but empirical therapy is especially tempting in a condition whose outlook has been regarded as so grave. Whatever this mode of action and in whatever terms, whether neurological or psychological, it is stated, the fact remains that the CO<sub>2</sub> inhalations appear to have initiated in this case a return towards normality.

### Summary

A classical case of Gilles de la Tourette's disease is described in which coprolalia, gradually increasing in severity over a period of four and a half years, had forced the patient into becoming a recluse, confined to the home in a state of almost complete social isolation. Though psycho-analytically orientated psychotherapy produced no change in the frequency or form of the patient's utterances, carbon dioxide treatment initiated an almost immediate improvement in symptoms which made discharge from hospital and rapid return to work possible. This improvement has been maintained over the 18-months period of follow-up. The difficulties encountered by the author and others in the psychotherapy of this condition are discussed, and some speculations are made upon the possible neurophysiological basis for the interruption of these repetitive and apparently self-perpetuating speech disturbances.

I thank Dr. Kräupl-Taylor for his advice and for kind permission to publish this case

### REFERENCES

- Abraham, K. (1921). In *Selected Papers on Psychoanalysis*. London.  
 Adrian, E. D. (1930). *Proc. roy. Soc. B*, 106, 596.  
 Ascher, E. (1949). *Amer. J. Psychiat.*, 105, 267.  
 Ashby, W. R. (1952). *Design for a Brain*. London.  
 Eccles, J. C. (1953). *The Neurophysiological Basis of Mind*. New York.  
 Gilles de la Tourette, G. (1885). *Arch. Neurol. (Paris)*, 9, 19.  
 — (1899). *Sem. méd. (Paris)*, 19, 153.  
 Guinon, G. (1886). *Rev. Médecine*, 6, 50.  
 Heuscher, J. E. (1953). *J. nerv. ment. Dis.*, 117, 29.  
 Itard, J. M. G. (1825). *Arch. gén. Méd.*, 8, 403.  
 Lorente de Nó (1947). *Stud. Rockefeller Inst. med. Res.*, 131, 132.  
 Mahler, M. S., and Luke, J. A. (1946). *J. nerv. ment. Dis.*, 103, 433.  
 — and Daltroff, W. (1945). *Amer. J. Orthopsychiat.*, 15, 631.  
 — and Rangell, L. (1943). *Psychiat. Quart.*, 17, 579.  
 Meduna, L. J. (1953). *J. nerv. ment. Dis.*, 117, 39.  
 O'Brien (1883). *J. Straits Br. Assat. Soc.*, p. 143.  
 Prince, M. (1906). *J. nerv. ment. Dis.*, 33, 29.  
 Trousseau, A. (1867). *Clin. méd. Hôtel-Dieu*, Paris.  
 Weisman, A. D. (1952). *A.M.A. Arch. Neurol. Psychiat.*, 68, 444.  
 Wilson, S. A. K. (1955). *Neurology*. Butterworth, London.

## AGE AT WHICH THE DECIDUOUS TEETH ARE SHED

BY

E. M. B. CLEMENTS, M.B., B.S.

E. DAVIES-THOMAS, M.R.C.S., L.R.C.P.  
L.D.S. R.C.S.

AND

KATHLEEN G. PICKETT, B.Sc.

(From the Department of Anatomy, University of Birmingham)

The age at which the milk teeth of children are shed is a subject which has been relatively little studied. In 1923 Hellman gave figures based on a survey of American boys and girls from poor and wealthy homes. In this country, a survey of children at an institution was made by Stones, Lawton, Bransby, and Hartley in 1951. This gap in our knowledge is surprising, for there is good reason to believe that the age at which the deciduous teeth are shed may influence the age at which the succeeding permanent teeth erupt (Leslie, 1951).

The statistics presented in this report have been obtained by new methods which allow a more accurate assessment of mean shedding times to be made than has hitherto been possible.

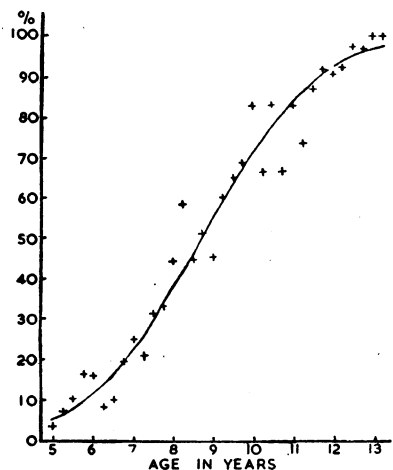
### Method

The analysis has been made from data relating to a sample of 1,427 boys and 1,365 girls aged 5 to 13 years, attending infant, junior, and secondary modern schools in Birmingham. The children were examined during the course of the Birmingham Anthropometric Survey, and are fully representative of the elementary-school population of the city.

At the examination a series of anthropometric measurements and dental observations were made on each child, the latter by the same observer throughout (E. D.-T.). An account of the information recorded and the way in which it was prepared for analysis was given in a previous paper (Clements, Davies-Thomas, and Pickett, 1953).

For the purpose of this analysis, all deciduous teeth seen in the jaw were coded as "present" and missing teeth as "shed," the latter category including teeth either shed or extracted. The space might be empty or be filled by a permanent tooth.

The coded records in the form of punched cards were sorted into order of ascending age and then formed into groups with an age range of three months. Within each of these age groups the proportion of children with a particular deciduous tooth present was calculated. This was done for each deciduous tooth in turn. The proportion gradually decreases with age until all the children have shed the tooth.



The observed and expected shedding frequencies of boys' upper first deciduous molar tooth.