

CONTRA-INDICATIONS FOR LEUCOTOMY : WHOM NOT TO LEUCOTOMIZE.

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Now that more than six years have elapsed since the introduction of leucotomy in this country, it is becoming possible to assess more accurately its remoter effects. The increasing use that is being made of the operation bears witness to the beneficial results that have been obtained by it, but the justifiable enthusiasm occasioned by the dramatic improvements it has produced in some cases apparently resistant to all other present-day methods of treatment must be tempered by a sober consideration of all the sequelae of section of the prefrontal fibres. While it is undoubted that after it many cases are sufficiently recovered to resume a full and satisfactory social life, and an even larger number are either freed from intense misery or from hostility and aggressive impulses and enabled to take a more co-operative part in the sheltered life of a hospital community, there are a few whose behaviour following the operation is definitely less satisfactory than it was even at the height of their illness. Furthermore, even in the successful cases, certain undesirable traits have often been noted.

It is not proposed to deal in this paper with all the contra-indications for leucotomy, but to draw attention to a few cases, operated on at the Burden Neurological Institute, in whom the undesirable results are so pronounced that it is felt it would have been better had these patients not been operated on. It is hoped that this preliminary study will be followed by reports from other observers on the patients in whom the results are unsatisfactory.

An attempt is made, however, to discover if possible some common factor or factors in these cases which may be of general validity, and so capable of being used as a yard-stick whereby to judge of the advisability of leucotomy in any given patient. For this reason also these unsatisfactory cases are compared with some that are considered as being most successful, since it is thought that the contrast may help to throw into relief those pre-operative factors which most clearly distinguish the one type from the other.

Owing to the fact that the most outstanding changes which result from the operation are changes in personality, rather than in intellect, the reports on these patients must necessarily take the form of personal histories, but these have been made as brief as possible, and only include those features which are considered relevant to the point at issue.

Although most observers are agreed that the results obtained in the obsessional neuroses and depressive states are generally better than those in schizophrenia, it is noteworthy that the unsatisfactory cases reported here include

two neurotics, an anxiety and an obsessional case, and one schizophrenic. The undesirability of the post-operative personality seems much more definitely allied to the character of the patient prior to his illness than to the form of illness to which he succumbed. In these cases the patients' character undeniably contained unpleasant or anti-social traits, which after operation became even more evident.

It is reported of W. W—, who was leucotomized in September, 1943, aged 27, that she was always asocial, and although a member of a large family, being the second of 6 children, was different from the others. She was dependently attached to her very indulgent mother, but extremely jealous and determined to have her own way, intensely self-centred, and with many neurotic traits, such as fear of sleeping alone and nail-biting. She did not make friends at school, but is said to have enjoyed practical jokes of a mean kind. After she left school at 14 she frequently changed her jobs, and failed to make a success of any of them. She had no ambitions, but her main interest in life seems to have centred round sex. Even here, however, she appears markedly ego-centric, for although she preferred male company and indulged in sex play and masturbation, she evinced no real affection for her boy friends. Women she regards as rivals, and was avowedly jealous of one of her sisters whom she considered prettier than herself. In spite of her sexual libido she was so childishly and egocentrically attached to her mother, who provided her with the protection she desired against the harsh contacts with reality which mature responsibility inevitably brings, and which her timid and egocentric nature feared, that she always declared she would never marry unless her mother could live with her.

Her first severe obsessional symptoms began at the age of 18. At this time ideas came into her head about people committing suicide, gassing themselves, or cutting their throats, and whenever these ideas came she had to do whatever she was doing at the time over and over again. These ideas may have been sado-masochistic manifestations of her sex impulses. The pre-operative Rorschach test seems to give some confirmation to this view; throughout there was an excessive pre-occupation with sex, e.g. she gave a similar response to cards III, IV and VI, viz. "the bottom part of the body, may be female"; and she said of all the cards that they resembled one another, indicating that they all suggested female anatomy. Her response to the emotional effect of card II was very interesting. "I think these are like two animals—cows. The red part looks like blood. I wondered if they were male and female; I don't know why; they both look the same. I think I said when I first saw them (she had seen the first two cards on a previous occasion) they might be being slaughtered, when I thought I saw blood." In the discussion the only reason she could give for thinking them male and female was the fact of there being two.

These sado-masochistic phantasies probably gave the patient considerable sensual pleasure; when interviewed prior to the operation she volunteered that she always liked to hear about other people's downfall. At the same time she was troubled by a sense of guilt, and it was this that led to her excessive worrying. "I worry because I've got a guilty conscience." "I think of all the wicked things I have thought about." The obsessional habits and the later obsessional rumination were probably defence mechanisms against and an expiation of these criminal phantasies.

The neurosis was so severe that she had entirely given up work at the age of 22 and was wholly dependent on her family, whom she burdened excessively with her miseries and her scruples. She was under medical attention for many years, and had received various forms of treatment before leucotomy in 1943.

After the more immediate post-operative effects of anergia and foolish euphoria had worn off, she seemed for a while slightly but definitely better. She ceased to talk about her worries, read more than she had done for years, slept better, and seemed more genuinely fond of her young man. She married in 1944, but unfortunately her husband, though intelligent, is also neurotic, and the marriage has not been a success. As her husband was conscripted in the Pioneer Corps, she continued to live with her parents. She openly despises him and thinks him lacking in "male

assertiveness," and has only a profound contempt for his interest in music and poetry and his "feelings for humanity." The patient herself now likes reading "romances," i.e. erotic love stories, and explicitly states that she has no interest whatsoever in humanity. It is worth noting here that in a recent Rorschach test, performed elsewhere, there were reported to be 11 animal movement responses, FM, and no human movement, M, indicating the existence of very strong sexual libido. Sexual relations with her husband are unsatisfactory, and she states that she is much more passionate than he. There is constant quarrelling and bickering, and she now openly enjoys saying cruel things and inflicting suffering on others.

She is extremely idle and does little in the house, and is still excessively meticulous and very slow. She takes no interest in anything outside her own needs and frustrations, is irritable, resents noise, intolerant of her young brother, jealous of her married sisters, and inconsiderate.

Recently she was admitted to a psychiatric hospital for further investigation. Here she was disliked by most of the patients and the staff, and though she complained of "being terrified" of everything and of "suffering agonies," there was no evidence of any depth of emotion. She admitted taking no interest in the other patients' progress, and appeared amazed that they should show sympathy with her. She was idle, and exhibited a few obsessional symptoms. During her stay there was, however, some slight improvement noted as the result of hospital routine and discipline.

In this case leucotomy has undoubtedly relieved the patient of her conflicts and of the emotional distress which these caused her, but appears to have done so by removing the "conscience" which was one of the elements in the conflict, leaving the field open to the aggressive sadistic impulses associated with her overwhelming erotic interests. She is entirely egoistic, and completely lacking in feelings for other people. The behavioural habits which she acquired during the years prior to the operation are now persisting relatively unaltered, though one of the motive forces, namely her conscience or a sense of guilt, is no longer operative. Her conduct is little changed and she is definitely more unpleasant and a more amoral person than she was formerly.

The second case, which it is also thought advisable to report fairly fully, is that of V. B—, a man now aged 48, who was one of the earliest patients treated by leucotomy at the B.N.I. in 1941.

He also gave a long history of nervous trouble, and was inclined to date it all from the first world war, during which period he was in the Army for 3 years and received two small gunshot wounds. He married soon after his discharge from the Army and has a family of 4 children. He was a self-absorbed, irritable, quick-tempered person, intolerant of noise, and with no real interest or hobbies. He never made friends, and was a hard, unsympathetic man who is said to have led his son a dog's life, and was occasionally violent to his wife. He had many jobs of the semi-skilled or labouring type, but was frequently off work with nervous upsets and was unemployed for 5 years. Nevertheless he was always clean and neat, did not use bad language, and was strict with his family, insisting that they observe the conventional proprieties.

In the second world war he was considerably upset by the air-raids, and broke down completely after he had been detailed to clean up a shelter in which many people had been killed by a daylight raid. He became unable to eat and sleep, and just wandered about the streets hardly knowing what he was doing; later became unable to concentrate and was always listening for sirens. His distress was mainly egocentric, and was caused by the apprehension of danger to himself, but it was accompanied by a sense of shame concerning his own cowardice, and he was upset by the relatively nonchalant attitude of his wife and children: "I felt ashamed because they were all so much better about the raids than I was."

After the operation he became relatively indifferent to the air-raids, but some time afterwards when working on an aerodrome near where bombing practice was being carried out, he found it upset him and had to give up the job; but he ceased to worry the moment he was away from the immediate threat of danger. He has

had several jobs, but seems to have been very casual about his attendance and probably also about the standard of his work, and it is probably for this reason that he is unemployed and has been for some time.

He has now become so difficult that the family are finding it impossible to live with him. He seems to have no feeling for anyone and is intensely selfish and intolerant. He is very lazy and rarely goes out, except for an occasional visit to a "pub" and his weekly attendance at the Labour Exchange. Flies into rages over trivialities and is sometimes violent. He wants everything for himself, and will not tolerate the slightest disturbance of his own comfort. Mimics and bullies the children, is very argumentative and uses filthy language. He tends to behave better in the presence of outsiders. His wife writes: "If any of the girls are ill, they are afraid to stay at home as he says they are shamming, and if I say I have an ache or pain he says he is sick of hearing about them, and when I fall or cut myself he simply laughs about it; in fact, it is the only time he laughs, when anyone is in distress or hurt."

He attends to his own toilet and is fairly particular about his external appearance, but he is by no means as clean as he was, and his daughter thinks he has not had a bath since the operation.

The patient himself tells quite a different story, and is perfectly self-satisfied; says he gets along very comfortably with the family, feels fairly well, and is not in the least disturbed by having no job.

The description of the "man" in the Raven projection test gives his "self-portrait," and is therefore quoted in full as it is felt to be a very revealing document. The test was done on August 14, 1946.

"The Man."

"Is he definitely drawing? He might be writing—if so he will say 'Dear Sir' to start his letter with.

"He doesn't know exactly what the man might be interested in—he thinks he might be a workman of some sort and that he's definitely not a clerk or a business man. He's interested in football or cricket—a sporting man, not very old, not more than about 30 I should think. When he stops what he is doing he will think, 'I hope that will be the last of that—I hope that will settle things definitely.'

"His real work is as an ordinary factory worker. (V. B— found it hard to imagine what he likes about his work.) He is on the tidy side and might be in an engineering works.

"(What does he dislike?). Well, of course no one actually likes work—to tell the truth, no one actually likes their work—it's hypocrisy to say the ordinary workman likes being cooped up in a factory for 8–8½ hours a day. I certainly think he's no different to the ordinary workman.

"If he's under supervision the foreman or 'passer' of some description will see his work, and if it wasn't right, well, he'd be told. The foreman will think whether he's done anything wrong before, and if he has, then he will give him the sack—dismiss his services; but if he hasn't done anything wrong before, they may overlook it—quite possibly it was a slip on his part.

"He would say, if it was a first slip on the part of a very good workman, 'Well, it's wrong—don't let it occur again.' But if it had happened before, would say, 'We've warned you before, and we can't warn you again.'

"He will think, 'Well, I suppose if it's the first occasion I shall have to be more careful, but if it's the second or third occasion then I shall have to get another job, and what I shall tell them I don't know. I shall have to pull myself together and not make so many mistakes in life.'

"He likes the sort of people—well, I should imagine the common-or-garden workman such as myself; interested in sport, and perhaps the sort who go to pictures—I don't go myself—football, cricket, boxing—what the majority of men go in for.

"He prefers a man's company—male company he would prefer.

"He dislikes—well, it's hard to say. From the look of him I think he would dislike religious people—not the sort of people who just go every week to church, but those who have religious mania—duty bound to go once a week. He's not a girl's man—of course we know most men get married, and many certainly not before it's time for them to.

"What annoys him or makes him angry? Well, I should say he's a man who doesn't like being interrupted. Many like being interrupted as a chance of stopping work, but I think he is a man who likes to get on with his work.

"What does he do when he's angry? Oh well, it's hard to say. I've met some very queer people—I've met some very violent people and had to deal with them—but he might forget it by the next day.

"He is frightened by any sudden noise—like a motor-cycle back-firing, or something like that.

"When he is tired anything might worry him. I consider that anything would disturb him when he should be resting—he would consider that it wasn't right for that to happen when he wanted to rest. He would brood for a little while, and then go off on his own for some little while—possibly for a long walk—and then come home and sleep it off.

"He saw something funny—what? Well, I don't know what you would consider funny, but, er, . . . some funny things can happen, such as a . . . you might be going along the street and you might see a cat nearly run over. Well, if the cat was only nearly run over, and scrambled out of the way in time, I should consider that very funny, and I should imagine that he would consider it very funny.

"He enjoys seeing a good football match more than anything else, or alternatively a good cricket match.

"*Dreams.* Oh well, practically all of us want more in life than what we've actually got in these worldly goods, in other words, money. I should imagine that he would naturally dream that he wanted more money, and if he got what he dreamt I should imagine it was more money.

"Well, I should think myself, I should imagine that he would put that £1,000 in the Bank or invest it in some business or other and carry on with his own work normally, and let the interest accrue.

"When a man of his description has been dreaming, he usually wakes—er—in a very torpid condition. I know by my own experience, and usually I know that when I wake I am very sluggish, when I wake from a dream of any description, whether it's good or bad—and I should think he was the same.

"Well, yes, I should think that he was satisfied to a certain extent in that he's got a good job, and I think he is satisfied in doing his job, but I certainly think he has got ambitions to get a bit higher in life if he can.

"Well, I don't think he has got any particular aim in life, only just doing his own work, and it's quite possible he does things, such as—er, investment on a football pool, or horse racing, or anything like that. That's his one ambition in life, I think—is to make money that way.

"Well, I certainly admire him by what I think of him, because I think he's rather inclined to be broad-minded, and addicted to sport generally.

"Well, I don't know that there is anything I dislike about him. I can't see that there is anything the matter with him that I could dislike. Well, I think I've given as good a description of him as anyone could.

"Well, I should imagine he was like myself—I should think we're near enough the same person as regards likes and dislikes.

"Well, I certainly think I like the same things generally. I live the same sort of life that he would live as regards sport and work, and I think it's—er, well, we're near enough the same person."

The portrait is undoubtedly that of a materialistic egoist; there is no mention of nor consideration for any other person. His description of something funny confirms his wife's statement, since the only example he gives is that of a cat being nearly run over.

The other case, A. C—, now aged 37, was an unmarried woman who, having been fairly strictly brought up by her grandmother, had for many years earned her living as a barmaid and prostitute. She then lived for 7 years with a man, having one illegitimate son by him. Her illness was precipitated by this man's desertion of her. After admission to hospital she was difficult, hostile, sullen, and negativistic, but she continued to evince some affection for and interest in her son, and

would respond slightly to kindness, and it was obvious that at least some of her behaviour was motivated by feelings of shame and self-reproach. She imagined people said abusive things about her, which made her lose her temper and caused her to shout back at them.

After the operation she became much more hostile, and refused to co-operate at all, saying that she hated women, and that all she wanted was a man and that she had always wanted men. She bitterly resented the enforced abstinence of hospital life and was truculent and aggressive, and finally relapsed into mutism. She no longer evinced any interest in her son.

In a recent paper, detailed histories were given of 10 other patients treated by leucotomy at the B.N.I., and while all these can be said to have benefited from the operation, nevertheless in some of them the accentuation of certain undesirable traits of character can be seen, though the character considered as a whole shows many improvements which offset and counterbalance these.

If we now turn to the study of the most successful cases, it is also evident that the character of the person prior to his illness is of more outstanding importance than the clinical type of illness. I shall only briefly quote two cases to illustrate this :

M. W—, now aged 56, was operated on in August, 1941. He was the son of a railway official, who later became a miner in order to earn bigger money for his wife and five children. The patient himself rose to a position of considerable responsibility as a departmental manager in a large industrial concern. He was energetic, conscientious, capable, and actively interested in religion of the verbose emotional type. He was nervous, self-conscious, self-critical, and inclined to worry. His nervousness increased after the outbreak of war in 1939 and he began to suffer from abnormal physical sensations, particularly in his groin. He expected the Germans to begin large-scale bombing immediately, and whether or no this led him to consider his own preparedness for death and judgment, it is certain that he became preoccupied with certain minor sexual misdemeanours of his youth, and unjustifiably attributed his new and disturbing physical sensations to syphilis. He began to suffer from severe insomnia and loss of appetite, and became profoundly depressed and actively suicidal.

His recovery after the operation was slow, and several months elapsed before he was fit to be discharged and again before he was fit to resume work, in 1943. With his consent we subsequently contacted his employers, who are perfectly satisfied with him, and whose only criticism is that he seemed to show a little jealousy of the man who deputized for him during his illness.

His wife is very pleased, and finds him better than he has ever been—calmer, less excitable, less worrying, less self-conscious, but still active, alert and quite as considerate and affectionate as formerly.

L. H. W—, now aged 40, was the son of poor parents who rose by his own ability to be a bank clerk. He had one brother and one sister. He was brought up in a very religious atmosphere, with very strict views about sex. Although he discarded the religious beliefs of his parents, he remained very scrupulous and conscientious, self-conscious, reserved, anxious to be friendly but not always succeeding, undemonstrative, and with considerable sex-repression. He lived with his parents and contributed largely to the family budget, and his humble origin and rather unusual appearance gave rise to feelings of inferiority. Finally he began to suffer from severe insomnia and became increasingly preoccupied with and depressed by his anxieties, and on one occasion attempted suicide by taking 28 medicinal tablets.

Since his operation in 1943 he has returned to the bank, and he married, in the summer of 1945, a girl who had known him for 11 or 12 years. She seems perfectly satisfied with him ; says he has more confidence, is on a more even keel, and is more sociable though needs a little pushing from her. He is kind, but perhaps a little more selfish than he used to be and not quite so tactful, and doesn't care so much about the effect on people. Whereas before, owing to the poverty of his childhood he was unduly careful with money, he is now more generous. He wants to keep his marriage as happy as possible, and has many interests ; likes pottering

about the house, enjoys cigarettes and his "pint," reads his literary "favourites" regularly, enjoys swimming, and is interested in nature, birds, astronomy and photography. Still likes to study and do things properly. Has no interest in religion, is quite content with the earth as it is and doesn't bother with the hereafter; thinks that when we die it is the end.

His wife feels that the results of the operation have been entirely good, and has not noticed any defects which she can attribute to it.

It is apparent that in spite of difficulties due to environment and temperament these two men had both achieved considerable success, and were playing a useful and responsible part in the social community and were liked and respected by those who knew them. In both there was also considerable conscientiousness and anxiety about their ability to live up to their self-imposed standards, and they were unduly self-conscious and troubled by unnecessary scruples. The removal of this scrupulous conscientiousness relieved them of the disabling symptoms produced by it, and so effected considerable improvement. The total personality, however, was basically well adjusted both to the environment and the social community, as evidenced by their earlier success; they had no outstanding anti-social or immoral impulses, and their post-operative behaviour therefore accords well with the conventional demands of the society in which they live.

DISCUSSION.

If the three failures are studied together, certain features emerge. All showed egoism and lack of social adjustment. They had a poor work record, and had none of them achieved any real success, nor had they given much evidence of any real altruistic affection. It is true that W. W— was very attached to her mother, but in a childish, dependent way; that V. B— was married and had three children, but he seems to have shown them little affection, and his remark in the post-operative Raven projection tests seems very self-revealing—"He's not a girl's man; of course most men get married, and many certainly not before it's time for them to." A. C—, although socially the least respectable, nevertheless does seem to have had some real affection for her son, and probably also for the man with whom she cohabited for 7 years.

All three had evolved their own pattern of behaviour. This was least satisfactory in the case of W. W—, who had gradually become completely dependent on her family, whom she burdened excessively with her interminable talk about her misery and her worries, and with her obsessive rites. V. B— and A. C—, on the other hand, were coping rather more successfully with life until they were overwhelmed by a relatively major catastrophe—air-raids in the one case and desertion in the other. In each case the catastrophe completely disrupted their habitual mode of life, and both became more or less psychotic. V. B— became confused, unable to concentrate, sleepless and depressed, while A. C— became hostile, negativistic and aurally hallucinated. During their illness new ways of reacting, i.e. new habits were formed, which had little in common with their former habits.

After the operation W. W— and V. B— were soon able to return to their former environment, and resume their former way of living. In many respects,

therefore, their behaviour is unchanged, the only outstanding feature being the marked increase in their egoism and lack of consideration for others.

A. C— never became sufficiently well adjusted to be considered suitable for discharge from hospital, and her present environment therefore is the same as it was during her illness, and tends to perpetuate the same kind of behaviour, a similar stimulus evoking a similar response, and she has had no opportunity to resume the habits of her pre-psychotic phase. Furthermore, the enforced sexual abstinence due to her detention in hospital aroused considerable emotion which motivated her post-operative behaviour, making her seem more hostile and unco-operative than before. It is interesting to speculate what might have happened had it been possible to allow this patient to satisfy her erotic cravings, and return to her former life of prostitution. It is arguable that under these circumstances she might have resumed many of her pre-psychotic habits, and become, if not a desirable member of society, at least able to maintain and readjust herself in the community as a prostitute.

In making a final assessment of the effects of leucotomy the problem of re-education is of paramount importance. Clinical observation and animal experiment have shown that the old topographical idea of the cerebral cortex is erroneous, and must be replaced by a more holistic view, since it has been found that if one cortical area is damaged, some of its functions may subsequently be more or less efficiently performed by some other area.

Thus the increasing utilization of vision and touch may eliminate many of the disabilities due to loss of hearing, or of vision, touch, and temperature those due to loss of sight. There is also evidence, at any rate with efferent nerves and fibres, that the function which is lost may even be recovered, and not merely compensated for by substitution.

It is therefore probable that the functions which are disturbed by section of the prefrontal fibres may later be restored to some extent by developing the latent potentialities of the rest of the cortex.

It is undoubtedly true that we are all creatures of habit, and that we become increasingly so with age. It is, of course, possible for a well-established habit to be broken, and be replaced by a new type of response, and this breaking of a habit may be brought about by the presence of external circumstances, or by an inner conviction or desire. The substitution of good habits for bad ones demands the recognition of purpose and values, and is felt as a moral obligation. It requires so much effort to break a well-established habit that it cannot be done unless the motivation for so doing is adequate.

Much of the abnormal behaviour in neurosis and psychosis is conditioned by autistic thinking and is self-determined. There is some evidence that after leucotomy the patients become more extraverted, are more susceptible to external influences, and more objective and materialistic in their outlook. If this be true, then any desired change in the patients' behaviour must to an increasing extent be conditioned from without, and opportunities must be provided for the re-establishment of previous good habits, and strenuous effort made to replace bad habits by some satisfactory ones. Furthermore, the question of adequate motivation must be seriously considered, and where there is evidence of an increased egoism, it may be necessary to base one's

re-educational programme almost entirely on motives of self-interest, relying on the judicious use of rewards. If many good habits had previously been formed, the sooner the patient can be returned to his normal surroundings the better, for the objects and events of his environment will tend to re-awaken his previous mode of behaviour. It is bad, however, to allow any patient to drift along in an environment in which he has formed unsatisfactory habits, for these will simply be perpetuated ; this may apply equally to his own home, or to a hospital ward. As far as possible, old interests should be revived and new ones introduced, and a regular disciplined routine adopted in order that stable habits of a satisfactory kind may be formed.

SUMMARY.

The occasional occurrence of undesirable traits has been recorded in the post-operative characters of certain patients treated by prefrontal leucotomy.

In this paper are given reports on three cases in whom the personality after the operation is on the whole less satisfactory than it was before, and these are compared with successful cases.

The conclusion is reached that the basic character and outstanding traits of the total personality are of greater importance for assessing the probable results of the operation than the particular type of mental disorder from which the patient is suffering.