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PSYCHOSURGERY IN MIDCENTURY

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EVERY new procedure is subject to four stages of appraisal by the medical profession before its final place in the therapeutic armamentarium is established. First, the period of doubt. A few proponents of the discovery must work hard to be heard. This is followed in the second stage by extensive application and variation. The third period is again one of doubt. Results of the second stage are evaluated. Finally the true worth of the procedure becomes apparent and its limited and specific use is accepted.

Psychosurgery is now in the second stage. Lobotomy is performed for mental disturbances ranging from suffering due to organically-caused intractable pain, through affective disorders, to schizophrenia. In most clinics and state hospitals the only indications for lobotomy are severity and duration of illness and failure to respond to other forms of therapy. Improvement is often measured in terms of the patient's tractability. There is no question that psychosurgery is being extensively applied throughout the United States and Atlantic community.

Variations of the original procedure are also in abundance. The original closed method sponsored by Freeman and Watts¹ has now been almost completely superseded by the open technique developed by Lyerly^{2,3} and adapted by Poppen. Mettler and Rowland's⁴ finding that the lateral site of entry

used in the original procedure almost invariably damaged the so called motor speech area (Broca) of the cerebral hemispheres should serve to discourage those who continue to use this approach.

Frontal lobectomies by Peyton⁵, frontal gyrectomies by Penfield⁶ and topectomies (areal removals) by the Columbia-Greystone associates⁷ have been attempted. Only the topectomy has promise of survival among these. Cortical undercutting (Scoville⁸) is a similar modification designed to restrict the psychosurgical procedure. Transorbital leucotomy currently used by Freeman⁹ is a technical simplification which has shown great promise but also potential hazards in unskilled hands which may outweigh its advantages. Other variations of psychosurgical approach include variations in plane, percentage and location of frontothalamic tracts cut; attempts specifically to interrupt frontocaudate fibers¹⁰ and novocainization of frontal fibers as a diagnostic procedure (Van Wagenen).^{10a} Finally, there are ventures into cortical areas other than the frontal lobes and destruction of subcortical nuclei. Penfield,¹¹

¹ Freeman, W., and Watts, J. W. *Psychosurgery. Intelligence, Emotion and Social Behavior following Prefrontal Lobotomy for Mental Disorders*. Vol. 12. Springfield, Ill.: Charles C. Thomas, 1952.

² Lyerly, J. G. Prefrontal lobotomy in involuntional melancholia. *J. Florida M. Ass.*, 1938, 25: 225.

³ Idem. Prefrontal lobotomy with reference to involuntional melancholia. *South. Med. & Surg.*, 1944, 196: 124.

⁴ Mettler, F. A., and Rowland, L. P. Relation between the coronal suture and cerebrum. *J. Comp. Neur.*, 1948, 89: 21-40.

⁵ Peyton, W. T., Moran, H. H., and Miller, E. W. Prefrontal lobotomy—excision of the anterior areas of the cerebrum. *Am. J. Psych.*, 1948, 102: 513-23.

⁶ Penfield, W. Symposium on gyrectomy. Part I. Bilateral frontal gyrectomy and postoperative intelligence. *Res. Publ. Ass. Nerv. Ment. Dis.*, 1948, 27: 519-34.

⁷ Columbia-Greystone Assoc. Edited by F. A. Mettler. *Selective partial ablation of the frontal cortex*. New York: Paul B. Hoeber Inc., Medical Book Dept. Harper & Brothers, 1950.

⁸ Scoville, W. B. Selective cortical undercutting as a means of modifying and studying frontal lobe function in man, preliminary report of 43 operative cases. *J. Neurosurg.*, 1949, 6: 65.

⁹ Freeman, W. Transorbital lobotomy. *Dis. Nerv. System*, 1929, 10: No. 12.

¹⁰ Van Wagenen, W. P. Observations on changes in states of mental depression and tension following surgical section of certain frontal lobe pathways. *Surgery*, 1946, 20: 656.

^{10a} Idem. Presented at the Harvey Cushing Society Meetings, April, 1950.

¹¹ Penfield, W., and Steelman, H. Treatment of focal epilepsy by cortical excision. *Ann. Surg.*, 1947, 126: 740-62.

Bailey and Green,¹² and Walker¹³ have carefully and tentatively attempted surgery in the temporal region for psychomotor seizures and reported effects in psychiatric syndromes. Occasional reports from Europe and South America tell of parietal and occipital ablations which have thus far been insufficiently documented to analyze. The studies of Spiegel and Wycis,¹⁴ on the other hand, of the destruction of thalamic and mesencephalic nuclei with a Horsley-Clarke apparatus designed for humans, should in a few years give abundant information as to the value of such a procedure.

Great variability and extensive application are the characteristics of the second stage. There are signs, however, of the approach of the period of critical evaluation. Careful research, both animal and clinical, has been underway for a number of years in an attempt to evaluate the effects of cerebral surgery on the physiological, psychological, and psychiatric equilibrium of the organism. Outstanding is the program of the Columbia group under the direction of Fred Mettler.⁷ Equally promising are the studies underway in various Veterans Administration Hospitals^{15, 16, 17} where a unique opportunity exists for close and continuous contact of variously trained investigators with the patient and for adequate control studies. Psychophysiological studies on animals are being carried out principally in three laboratories: the Yerkes Laboratories of Primate Biology (Yale and

Harvard Universities) under the direction of Karl S. Lashley; the psychological laboratory of the University of Wisconsin under the direction of Harry Harlowe; and the laboratory of physiology of Yale University under the direction of John Fulton. These studies have not yet proceeded to the point where generalizations can be easily made. However, they suggest that those who expect a permanent alteration in the physiology of the organism as a result of psychosurgery may be disappointed. Hence, easy "cures" with the stroke of the leucotome are not to be sought. On the other hand, these studies suggest that a temporary lability in psychophysiological adjustment does take place following psychosurgery and that the postoperative level of adjustment is determined to a large extent by the training program instituted during the period of lability. These studies are so designed that answers to specificity of the effect of locus of lesion on various types of behavior should be forthcoming and to give insights into the basic nature of the physiological and psychological alterations which underlie the alterations in behavior observed.

When the results of these studies become available and the results of statistical analysis of the follow-ups of the mass of data now accumulating (e.g. Connecticut Co-operative Lobotomy Project¹⁸) there will undoubtedly be a restriction of the now indiscriminate use of psychosurgery. It is hoped, however, that these studies may yield specific procedures for specific syndromes. It is this hope which spurs the efforts of those laboriously unraveling the results of the research which has been described.

In order that this hope be not in vain the results of the present extensive application of psychosurgery should be recorded. Careful

¹² Bailey, P., and Green, J. Meeting of the American League against Epilepsy, Cincinnati, Ohio, 1950.

¹³ Walker, A. E. Discussion at Harvey Cushing Society Meetings, April, 1950.

¹⁴ Spiegel, E. A., Wycis, H. T., and Freed, H. Thalamotomy; neuropsychiatric aspects. *New York State J. M.*, 1949, 49: No. 19.

¹⁵ Bernstein, L. Winter V. A. Hosp., Topeka, Kansas. Personal communication.

¹⁶ Sewall, L. G. (V. A. Hosp. at Roanoke, Va.) Presented at meeting of Chiefs of Professional Services, Coatsville, Pa., April, 1950.

¹⁷ Tatum, J. C. (V. A. Hosp. at Tuscaloosa, Ala.) Presented at meeting of Chiefs of Professional Services, Coatsville, Pa., April, 1950.

¹⁸ Connecticut Lobotomy Committee (Friedman, S., Moore, B. E., Simon, B., and Farmer, J.) A co-operative clinical study of lobotomy. *Res. Publ. Ass. Nerv. Ment. Dis.*, 1948, 27: 769-94.

description of the procedure; careful description of the illness; careful and long term follow-ups of the postoperative course are essential. This should be done in language common to all observers and should be filed in a common pool. The brains of all patients on whom adequate behavioral data are available, i.e. who die of causes other than the procedure, should be serially reconstructed

and the behavioral alterations correlated with anatomical changes. This type of co-ordinated study is underway in England^{19, 20, 21, 22} and the Scandinavian^{23, 24} countries. It would prove even more fruitful in the United States where a greater variety of lesions and a more extensive application of psychosurgery is the practice²⁵. Such a step would certainly hasten the day when psychosurgery will take its place in the practice of medicine as a mature procedure specifically applied to specific syndromes.

¹⁹ Dax, E. C., and Radley-Smith, E. J. Early effects of prefrontal leucotomy on disturbed patients with mental illness of long duration. *J. Ment. Sc., Lond.*, 1943, 89: 182-185.

²⁰ Dax, E. C., and Radley-Smith, E. J. Discussion: Prefrontal leucotomy with reference to indications and results. *Proc. R. Soc. Med., Lond.*, 1946, 39: 448-9.

²¹ Meyer, A., Beck, E., and McLardy, T. Prefrontal leucotomy, a neuroanatomical report. *Brain*, 1947, 70: 18-49.

²² Report of Board of Control, England and Wales. Prefrontal leucotomy in 1000 cases. London: H. M. Stationery Office, 1947.

²³ Rylander, G. Personality Changes after Operations on the Frontal Lobes, A Clinical Study of 32 Cases. Copenhagen: E. Munksgaard, 1939.

²⁴ Rylander, G. Personality analysis before and after frontal lobotomy. *Res. Publ. Ass. Nerv. Ment. Dis.*, 1948, 27: 691-705.

²⁵ Kolb, L. C. An evaluation of lobotomy and its potentialities for future research in psychiatry and the basic sciences. *J. Nerv. Ment. Dis.*, 1949, 110: 112-48.