

RE-EDUCATION IN APHASIA : A REVIEW OF 70 CASES

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THE problem of re-education in aphasia and kindred disorders has attracted the interest and challenged the skill of both neurologists and psychologists for the past fifty years. Among the earlier discussions of the subject, those of Mills (1904) and Froeschels (1914) are worthy of special mention. But it was only with the war of 1914-18 that the problem took on real practical urgency and large-scale explorations of the possibilities for re-education in aphasia were undertaken. This work was developed above all in Germany and is especially associated with the names of Poppelreuter, Isserlin, and Goldstein. Poppelreuter's work (1917) is, unfortunately, not available, but Isserlin (1941) has reported briefly on the work undertaken by Feuchtwanger at the Brain Injuries Institute in Munich. Of 178 cases of aphasia given re-educational treatment at this centre, complete recovery was reported in 10.1 per cent., marked improvement in 25.3 per cent., some improvement (partial recovery) in 55.6 per cent., and no significant change in 9 per cent. The great majority of the cases were traumatic, and these gave consistently better results than the few cases in which the aphasia was due to cerebral disease. Thus, all the cases who recovered completely or showed marked improvement were traumatic, and the group of cases who recovered partially included only 8 cases whose aphasia was due to disease. On the other hand, 50 per cent. of the patients who showed no improvement were cases of aphasia due to cerebral disease. The outcome of the re-educational work undertaken by Goldstein and his colleagues has not been presented in quantitative form, but valuable records of the technique, course, and outcome of re-education in individual cases are available (Goldstein, 1919). Goldstein (1942) has more recently summed up his experience of the problems and methods of re-education in a useful review. Other contributions to the German literature of this period worthy of mention are those of Froeschels (1915), Gutzmann (1916), and Reichmann and Reichau (1919). Re-training work with cases of aphasia in civil life has been described by a number of authors, but all this work has been on a very limited scale (Franz, 1924; Singer and Low, 1933; Weisenburg and McBride, 1935). Weisenburg and McBride, who

stress the need for more extensive studies, have presented a useful review and discussion of the whole field in their book on *Aphasia* (1935, pp. 92-100; 385-412).

An objective appraisal of the outcome and value of re-education in aphasia is far from easy in view of the lack of controlled studies. We are seldom able to compare in a controlled manner the course and outcome of the disorder in two equated groups of patients of which only one group has been given formal re-education. In consequence, we possess no definite standards whereby to assess spontaneous recovery of cerebral function as opposed to the effects of re-education. This is a particular disadvantage in the study of traumatic cases in which, as is well-known, spontaneous recovery is to be expected much more frequently than in cases of cerebral disease. Nevertheless, there is a certain amount of indirect evidence in favour of re-education of the traumatic case. Thus Frazier and Ingham (1920), in a review of the effects of gunshot wounds of the head, mention 16 cases of residual aphasia in which re-educational treatment had been given. They conclude that "although we have seen no evidence of the development of new language centres on the normal side of the brain, improvement has been marked in every patient of this group, the aphasic symptoms of some of which had previously remained stationary for several months" (1920, pp. 31-2). We may also mention that one of Goldstein's war cases made little progress for 3½ months after his injury, but considerable progress in the first two weeks of training which was then begun. In addition, there is evidence that re-education may appreciably hasten the natural course of recovery. Thus Weisenburg and McBride, in reviewing the outcome of re-training in their own cases, conclude that "re-education increases the rate of improvement and aids in overcoming specific disabilities and also in helping the patient to find new ways of achieving the results he is unable to achieve in a normal manner" (1935, p. 412). Lastly, all workers with practical experience agree as to the value of re-educational work for the aphasic patient's adjustment and morale.

We shall present in this paper the principal

results in 70 cases of dysphasia * and kindred disorders of language referred to us for investigation and re-education in this unit. This figure represents roughly 75 per cent. of the total cases of dysphasia referred for investigation. In the remaining cases, formal re-education was deemed inexpedient on account of unfavourable prognosis, gross defects of comprehension, or complicating psychiatric symptoms. The bulk of the concrete re-training work was undertaken in 28 cases by Mrs. H. Mitchell-tree, sometime speech-therapist to this unit, and in 42 cases by one of the present writers (E. B.).

Cases.—The cases comprised 66 organic acquired dysphasic syndromes and 4 developmental dysphasic conditions. Service patients numbered 37, and civilians 33. Thirteen of the patients were women.

In order to provide some measure of control for the influence of spontaneous recovery, we have divided the 66 cases of acquired dysphasia into two groups. In Group 1, re-education in all cases was begun less than six months after the onset of the disorder. In Group 2, on the other hand, re-education was begun more than six months after the onset of the disorder. In 4 cases in this group the interval was over a year. In view of the fact that spontaneous improvement is in general liable to be both limited and slow after six months, it is permissible to ascribe the greater part at least of any improvement made by the patients in Group 2 to re-education. It has unfortunately been possible to include only 14 cases in this group, and the available material is thus too limited to allow any determinations to be made of the statistical significance of the results. We nevertheless believe that a broad comparison of the outcome in the two groups will prove instructive.

The great majority of the patients in both groups were young adults between 20 and 45 years of age. Only 3 were under 14, and all but 11 under 45. The aetiology of the dysphasic condition was traumatic in 37 cases, vascular in 19, and neoplastic in 10. In Group 2, 5 of the 14 cases were traumatic and the remainder vascular. The average age of the vascular cases was slightly higher than that of the traumatic, 53 per cent. of the former falling within the 30-44 year age range as compared with 27 per cent. of the latter. In the cases of cerebral tumour, the time-interval elapsing before re-education was begun has been computed as from the date of operation.

The distribution and severity of symptoms in speech, reading, writing, and calculation are shown in Table I. The figures represent totals of cases in each group with impairment in the corresponding language field. In each case the degree of disability has been rated as severe, moderate, or mild.

* We propose henceforward to use the term "dysphasia" to cover all varieties of central language disorder apart from dysarthria and total aphasia.

A classification of the disorders of speech proper is given in Table II. Three of the 66 cases have been excluded in view of the fact that these patients showed no disturbance of oral speech at the time re-education in other fields was begun. The remaining cases have

TABLE II

	Mixed	Expressive	Receptive	Amnesic
Group 1	6	22	14	8
Group 2	2	8	2	1
Total ..	8	30	16	9

been classified in terms of the four-fold scheme advocated by Weisenburg and McBride (1935). This distinguishes (1) mixed expressive-receptive conditions; (2) predominantly expressive conditions; (3) predominantly receptive conditions; and (4) amnesic conditions. The second group includes, in addition to cases of the classical motor-aphasic type, a number of milder defects defined by Head (1926) as verbal aphasias. The third group is largely made up of cases of the type defined by Head as syntactical aphasias, but includes a few with defects of the semantic type. The fourth group corresponds to Head's class of nominal aphasias.

Methods and Procedure.—The programme of re-education was formulated in every case on the basis of careful individual examination and testing. Examination methods cannot be described in detail here, but were based on the procedures developed by earlier investigators (cf. Zangwill, 1945). It is sufficient to state that special attention was given to the nature, severity, and distribution of defects in the various language fields, to the patient's learning capacities, and to his psychiatric condition generally. The methods of re-training were adapted in large part from those recommended by earlier workers, in particular Goldstein (1919, 1942). Direct methods of re-education were found of principal value in the predominantly expressive speech disorders and it was often found necessary in these cases to begin with preliminary training in the use of the appropriate muscles (lip and tongue exercises). Thus the patient was shown first how to imitate, and then how to make, a number of positions and movements of the lips, tongue, palate, and larynx. After the necessary facility and control of these movements had been established,

TABLE I

	Speech		Reading		Writing		Calculation	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Severe	28	6	20	6	32	8	20	6
Moderate	13	1	15	3	11	1	13	4
Mild	9	6	10	4	5	4	9	2
Total ..	50	13	45	13	48	13	42	12

speech training proper was begun. This consisted in teaching the patient to imitate simple speech movements of the therapist, using visual and tactual aids where necessary. Thus the use of a mirror, whereby the patient could scrutinize his own mouth movements, was often helpful; and allowing the patient to touch first the therapist's mouth and then his own whilst pronouncing a particular sound was sometimes of value in correcting persistent errors of articulation. In cases where the patient could repeat, though not spontaneously produce, the necessary speech sounds, systematic repetition of these sounds was used as a method for re-establishing voluntary control. The proper association between every speech sound and the movements necessary to produce it was always stressed. This was made possible in certain cases by associating the required movements with some purposive act already within the patient's control. Thus the patient might be taught to pronounce the *p* sound by puffing out smoke. As the patient's speech improved, every effort was made to develop it within a more natural setting, and exercises in reading, naming, describing pictures, and simple conversation formed part of the speech-therapist's routine. The less formal atmosphere of the occupational therapy department was also very favourable for flexible exercises of this type.

Re-training in the cases of predominantly receptive dysphasia was in most cases along a more round-about route. Although little could be done directly in cases with any degree of word-deafness, disorders of reading could be profitably approached along indirect lines (compensation and substitution). In several cases of dyslexia, for example, it was found that the patient could recognize letters if allowed to trace their outlines with his finger-tip. This served as a basis for systematic re-education. The patient was first requested to trace the outline of large block-letters and to spell out simple words in this manner. When this method of recognition had become relatively automatic, the patient was given normal reading material and instructed to carry out cursive writing movements in reaction to it. These writing movements eventually became extremely rapid and abbreviated and finally dropped out, but were prone to re-appear with unfamiliar or difficult words. In favourable cases this technique led to the restitution of accurate, if slow, reading. Some patients, on the other hand, made little progress along these lines, and the use of non-symbolic visual cues, such as the picture series suggested by Goldstein (1942), in which letter outlines are derived progressively from pictures of concrete objects, was found of greater help. In general, we have no hesitation in stating that our methods were often purely empirical and adapted by trial-and-error to the individual case. Patients with less severe dyslexic defects were re-trained by a method of progressive practice. Reading material of graded difficulty was provided, and systematic exercises in reading both silently and aloud undertaken daily. Special instruction and help was given

with words or phrases found to present special difficulty, and complementary exercises in writing were generally undertaken. Thus the patients were often asked to write down from memory the gist of the material which they had read. The patients were also encouraged to study illustrated magazines and the like in their own time.

In the case of writing, re-educational work was indicated, especially in patients who had not lost the capacity to form and copy letters, but who presented dysgraphic symptoms in the context of a more generalized dysphasic syndrome. These patients were given systematic exercises in copying, spelling, and dictation, and occasionally instruction in grammar. In patients who had lost the capacity to form letters as such (whether as a primary agraphia or as part of a constructional apraxia), no satisfactory method of re-education was discovered. Re-training in cases of gross acalculia was achieved to a limited extent by the use of highly-concrete procedures comparable to those used in teaching young children. In milder cases, progressive practice in mechanical arithmetic (e.g. Kraepelin's adding tests) and simple exercises in arithmetic of the ordinary scholastic type were regularly given. The patients were also given practice in handling money in simple concrete situations. The duration of re-education varied considerably from case to case. As a rule, every patient undertook two sessions daily with the speech-therapist, each lasting half an hour. But many of our patients engaged in supplementary work of a re-educative character in the occupational therapy department or in their own time. This work was carefully co-ordinated with the formal sessions. The total number of such sessions was 25 or under in 22 cases, 26 to 50 in 22 cases, 51 to 75 in 12 cases, and over 75 in the remainder. The smallest number of sessions in any one case was 5, and the largest 290.

Formal re-education was terminated when the patient had improved to a point at which little or no practical disability remained, or, in the less responsive cases, when the language condition appeared to have become more or less stationary despite prolonged re-education. At this point, careful psychological re-examination was undertaken. The various language functions in regard to which re-education had been attempted were rated on a three-point scale as much improved, improved, or unchanged. These ratings were based on the following criteria: (1) the opinion of the senior member of the clinical staff of the unit in charge of the case; (2) the results of repeated psychometric testing; and (3) the patient's work record in the speech-therapy department. It must be borne in mind in assessing the results that progress ratings are based on the original degree of impairment of the affected language functions. They do not therefore necessarily reflect the degree of residual disability in comparison with the normal. Thus a severely dysphasic patient might improve very considerably with speech therapy yet remain

grossly disabled for practical purposes. A mild case, on the other hand, might improve relatively little yet prove to be very little handicapped in ordinary life. Our ratings therefore give no guide to absolute residual disability, and this may best be assessed from the figures for resettlement given at the end of this paper.

Outcome of Re-Education

The results for the two groups are given in Table III. This table shows the total cases in each group with defects of speech, reading, writing, and calculation classified in terms of initial severity and condition on final examination. The patients were graded separately in every field as *much improved* (M), *improved* (I), or *unchanged* (U).

It will be seen from Table III that speech in over one-half of the patients in Group 1, and in nearly one-third of those in Group 2, was judged to be much improved after re-education. The outcome in the case of reading, writing, and calculation is less satisfactory—the last in particular—but it will be noted that a minority of patients in both groups were considered to be unchanged from the point of view of these abilities.

Table IV shows the outcome in percentage form for both groups combined in relation to the initial severity of the disabilities. It will be seen that speech in 40 per cent. of severe cases, 56 per cent. of moderate cases, and 58 per cent. of mild cases underwent a marked improvement. On the other hand, the speech condition was unchanged in 34 per cent. of the severely disabled patients.

The outcome in relation to the type of dysphasic syndrome is indicated in Table V. The figures suggest (but do not establish statistically) that the most favourable results are given by the cases of predominantly expressive dysphasia. Thus nearly three-quarters of the cases of this type underwent a marked improvement.

Table VI shows the outcome as related to the ætiology of the dysphasic condition when oral speech alone is considered. It will be seen that 21 of the 35 traumatic cases were much improved in this respect and the speech condition unchanged in only two. In the vascular and neoplastic groups, on the other hand, speech was unimproved in roughly a third of the cases.

A word is in place regarding the disposal from hospital of these patients. Of the 55 adults in our

TABLE III

	Speech			Reading			Writing			Calculation				
	M	I	U	M	I	U	M	I	U	M	I	U		
Severe ..	Group 1		12	7	9	7	5	8	11	7	14	5	4	11
	Group 2		0	3	3	1	2	3	2	4	2	0	3	3
Moderate	Group 1		8	5	0	5	9	1	4	7	0	4	7	2
	Group 2		1	0	0	1	2	0	0	1	0	1	3	0
Mild ..	Group 1		6	3	0	5	5	0	4	1	0	3	6	0
	Group 2		3	3	0	2	1	1	2	1	1	0	1	1
Total ..			30	21	12	21	24	13	23	21	17	13	24	17

TABLE IV

	Speech			Reading			Writing			Calculation		
	M	I	U	M	I	U	M	I	U	M	I	U
Severe	40	26	34	31	31	38	33	26	41	21	29	50
Moderate	56	38	6	62	38	0	33	67	0	33	54	13
Mild	58	42	0	57	36	7	63	25	12	27	64	9

TABLE V

	Mixed			Expressive			Receptive			Amnesic		
	M	I	U	M	I	U	M	I	U	M	I	U
Group 1	2	1	3	16	4	2	5	4	5	2	5	1
Group 2	0	0	2	3	4	1	0	2	0	1	0	0
Total	2	1	5	19	8	3	5	6	5	3	5	1

TABLE VI

	Traumatic		Vascular		Neoplastic	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Much improved ..	18	3	4	2	3	0
Improved ..	10	2	2	4	3	0
Unchanged	2	0	4	3	3	0
Total ..	30	5	10	9	9	0

series who had been formerly in economic employment, 37 were resettled in gainful occupations. Of these, one was returned to military duty, 11 to clerical work, 12 to skilled manual jobs, and 13 to unskilled work. Ten patients were totally incapacitated. Of the patients who had been formerly in skilled employment, over half were returned to skilled work, and most of the remainder to unskilled work. In a number of cases, however, the job to which the patient was returned was lighter or less exacting than his former (civilian) occupation.

It was not found possible to record any significant change in the four cases of developmental dysphasic syndrome included in our series, but in none was it possible to continue training for more than a few weeks. We were, however, in the position to offer some suggestions as to the scholastic management of three of these cases and to arrange for further special training in one.

Summary

(1) The problem of re-education in aphasia is briefly considered and some practical methods of retraining described.

(2) The outcome of re-education in a group of 70 dysphasic cases is reviewed and evaluated. Treatment in 14 of these cases was begun six months

or more after the onset of the disorder, when relatively little further spontaneous improvement was to be expected.

(3) The results are considered in relation to the various aspects of language affected (speech, reading, writing, and calculation), and to the type, severity, and aetiology of the dysphasic condition. Although the number of cases is too small to permit a determination of the statistical significance of the results, it is suggested that the most favourable outcome is obtained in traumatic cases and in those whose symptoms are relatively mild and predominantly on the executive side.

(4) Two-thirds of the patients given re-educational treatment were resettled in economic employment.

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