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A modern approach
to the
basic forms of aphasic
disorders

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Approach to
A Modern Concepts of The Basic Forms of Aphasia Disorders

The subject of this ^{CHAPTER} [paper] is ^A the revision of the basic concepts of the basic forms of aphasia. That revision will be done in the light of modern Neuropsychology. It means we shall try not only to describe ~~basic~~ ^{principal} forms of aphasia but to single out some basic factors underlying each kind of aphasic disorder and to come as ^{CLOSE} ~~near~~ as possible to ^{AN} ~~the~~ understanding of their mechanisms.

Contemporary approaches to aphasia, well known in ~~the~~ ^{THOSE} modern Neurological [Clinic] do not differ significantly from ~~the~~ ^{THOSE} formerly derived by classical Neurologists; Their basic views ~~was~~ ^{BEGAN} ~~started~~ ^{WITH} by P. Broca and L. Wernicke and ~~they~~ ^{these} ~~two~~ views remained unchanged up to our time.

It was supposed that the posterior part of the first temporal convolution of the left hemisphere is responsible for the understanding of speech, and that its lesions result in a sensory aphasia. It was supposed as well that the posterior part of the ~~two~~ first frontal convolution of the left hemisphere is responsible for motor speech and that ~~its~~ ^{ITS} lesions result in motor aphasia. It was supposed that these two basic forms of aphasia are only ~~a~~ ^{part} of aphasic disorders and that more complex forms of aphasia exist. Among them, a Neurologist described "amnesic aphasia" (where word ~~finding~~ ^{was} ~~difficult~~ ^{DIFFICULTY} supposed to be the basic symptom), ~~and which is~~ associated with lesions of the left ^{motor} infra-parietal zone of the cortex. They described "transcortical aphasia," with inability of spontaneous speech as a basic symptom, and "conduction aphasia," where inability to repeat speech was supposed to be the principal symptom. In both cases Neurologists supposed that some association fibre paths ~~from~~ (inter-cortical connections between higher and motor centra of speech in the first case and sensori-motor connections in the second case) ~~were~~ ^{SUFFERED} ~~affected~~ ^{NO ONE} ~~by~~ ^{NO ONE} ~~these~~ ^{NO ONE} ~~basic~~ ^{NO ONE} ~~concepts~~ ^{NO ONE} remained without significant changes in the modern Neurological [Clinic], and although ~~no~~ ^{NO ONE} ~~body~~ ^{NO ONE} new ~~cases~~ ^{NO ONE} seriously the ideas of separate "centra" and their "inter

A lot of people think seriously

connections, - no significant attempts ^{HAVE BEEN} made to revise these concepts of classical Neurology.

It is our principal goal to revisit this field and to try to single out basic factors underlying different forms of aphasia, providing by ~~the~~ such an analysis a ^{MORE} adequate concept of basic forms of aphasia.

1. Sensory and motor aphasia.

Let us start with a revision of our concepts of ^{the} two basic forms of aphasia - ~~the~~ sensory and ~~the~~ motor.

As it was shown by classical Neurology, the basic symptom of the sensory aphasia is the patient's inability to understand speech, although his hearing is supposed to be preserved. Wernicke hypothesized ~~that~~ a disturbance of the "sensory concept of speech" (Wortbegriff) to be the essential cause of this synd defect; he postulated that the posterior part of the upper temporal convolution of the left hemisphere is "the center of sensory images of words" and if this zone is ^{BREAKS} broken down, an inability to comprehend the significance of words is a result.

We have seen a large ^{NUMBER} of such patients, and the clinical reality of this syndrome is ^{Beyond} ~~out of~~ doubt. The question we have to answer is why this syndrome takes place and why the patient is unable to understand words although his hearing remains undisturbed.

Two hypotheses were formulated, in the time of Wernicke, to answer this question. One of them was ^{THAT} ~~the~~ the speech center of the acoustic scale (Sprachsekte) was responsible for this defect and that a sensory aphasia has to be considered as a partial breakdown of hearing. This hypothesis ^{WAS NOT} ~~did not~~ proved: ^{THAT} it was shown ^{THAT} all parts of the tonescale perception remained unchanged in ~~for~~ patients with sensory aphasia. That is why another hypothesis - that of P. Marie - was proposed: ~~and~~ it was supposed that sensory aphasia is ^{THE} a result of a partial intellectual defect and that this group of patients ~~is~~ ^{has} become unable to understand speech because of their partial mental deficiency.

Further investigations showed ^{TOO} that this assumption does not hold ~~is~~ ^{to}: patients with sensory aphasia were able to complete complex intellectual tasks (where special inner

Reference?

Verbal links were not needed), they preserved ~~their~~ ^{THE} abstract attitudes, - and the cause of their lack of understanding of words remained unclear.

An Adequate answer to this question became possible only some 50-60 years after ~~the~~ Wernicke; it was connected with some basic advances in modern linguistics.

~~It was~~ In the thirties, ~~when~~ two outstanding linguists, N.S. Troubetzkoi and R. Jakobson, found that ~~to~~ ~~by~~ ~~well~~ preserved hearing is insufficient to understand spoken language, and that ^{such} ~~the~~ language is based on a phonological code - a system of phonological oppositions, different in different languages, and that ^{to} understand speech means to single out basic features of this code, ^{IN OTHER WORDS} ~~or - to~~ ~~the~~ ~~word~~ - to quality the sounds of ~~the~~ speech according ^{to} the phonemic system used.

Phonemes were understood as ~~such~~ ^A complex of sound features which provide the discrimination of meaning and changes of which result in the changing of the word's meaning.

In Russian ~~the~~ voicedness vs. unvoicedness are used as such features (docka having ^{THE} significance of "daughter" and tocka - that of "point"); hardness vs softness has a similar phonemic value (pye = le drink, pye° = dust); whereas the ^{LENGTH} ~~length~~ of a vowel ~~has~~ ^{NO} ~~not~~ such a phonemic property (more or ^{M-O-O-RE} ~~more~~ has the same meaning, whereas in German it is a ~~phon~~ decisive, phonemic feature, Stadt meaning ~~a~~ "town" and Staat - "country"). In ~~of~~ a group of other languages (such as Chinese or Vietnamese) tonal components are included in ^{THE} phonemic code, and the word "ma" can mean "to buy" in one tonality and ~~to~~ "to sell" in another, whereas these changes in tonality remain undistinguished for a Russian or English speaking person.

~~THIS~~ ~~fact~~ means that to understand a word, one has to single out decisive phonemic features and to include the sounds of the word in a phonemic system, otherwise to quality the sounds of the word.

~~From~~ The mechanisms needed for such ^A ~~an~~ ^{PHONEMIC} ~~acoustic~~ qualification of ~~the~~ sounds are intimately associated with the cortex of ~~the~~ "Wernicke's zone", which ~~is~~ belongs to the "secondary parts" of the cortical structures and which has close relation with other ~~parts~~ ^{lower parts} of regions of the "speech areas" (zone of Broca, ^{OF} ~~of~~ the operculum ^{OF} ~~of~~ Rolandus et.)

COULD A

1 Scientific revision of the classical concepts of the motor aphasia ~~could~~ be provided, and a new look ^{AT} the classical clinical picture of the motor aphasia ~~could~~ be found.

Modern physiology of ~~the brain~~ shows very clearly that voluntary movement is not at all a result of only efferent excitation which begins with ~~at~~ ^{AT} the level of the big pyramidal cells of the fifth layer of the motor zone of the brain cortex and the fibres of which ^{TRAVEL} go towards the ~~the~~ ^{cells of the} anterior horn of the spinal cord and then to the muscles. N.A. Bernstein showed clearly that, ~~the~~ ^{it} because of the high plasticity of the motor ~~a~~ system, the infinity number of ~~the~~ ^{its} levels of freedom provided by the joints and complexes of the limbs, and because of the permanently ~~changing~~ ^{CHANGING} tensions of the muscles, - it is impossible to find a mathematical formula which could explain the flow of ~~the~~ movement ~~only~~ ^{ON THE BASIS OF} ~~from~~ efferent impulses only. In every movement a system of efferent impulses ^{MUST} be active, and these ^{AFFERENTATIONS} ~~afferent~~ (kinesthetic, visuo-spatial) ~~afferentations~~ are responsible for ^{THE} permanent corrections of the movements, linked ^{WITH} ~~towards~~ a ^{SPECIFIC} ~~correct~~ goal. It is easy to understand that even a slight deterioration of these afferent influences inevitably results in a disorganization of co-ordination of movements and makes a well organized motor act impossible.

That is why a deterioration of every ~~new~~ ~~the~~ movement (including the motor organization of speech) includes at least two factors: one, of the afferent* (kinesthetic, visuo-spatial) organization of the motor field, i.e. the organization of ^A simultaneous ~~sequence~~ ^{effluent and the} of the movement, and the second - that of the ^{sequential} (or serial) organization of the motor act, ~~pro~~ ~~which~~ ~~provides~~ a kinetic shift from one link of the movement to another, which ~~pro~~ is necessary for the organization of every skilled movement.

A long series of observations showed that whereas the first group of factors is associated with the posterior parts of the cortex (post-central or sensory and

AND POSSIBLY ALSO EFFERENT? (REMEMBER LASHLEY'S PAPER?)

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PERHAPS EFFERENTS OF MOVEMENT ARE ORGANIZED & SERIALY PERFORMED.

parieto-occipital or visuo-spatial cortex), - the second group of factors - that of the serial organization of motor skills is closely associated with premotor zone of the cortex and their interrelations with the subcortical motor ganglia (cf. A.R. Lurija, 1966, 1970, 1973).

The same principle can be applied for a better understanding of the ~~org~~ cerebral organization of motor speech.

Motor speech requires at least a participation of two factors - the first providing a kinesthetic (articulatory) scheme of the articulation, the second being a cortical basis of fluent speech. It ~~was~~ ^{HAS BEEN} shown quite clearly that the first factor is associated with the kinesthetic parts of the sensory-motor area of the brain (predominantly with the lower parts of the postcentral zone) whereas the second factor requires the activity of the lower parts of the premotor area of the left hemisphere - otherwise ^{known as} the zone of Broca.

That is why not one, but at least two forms of motor aphasia (or the breakdown of the motor speech) can be described: the first being the afferent (or kinesthetic) motor aphasia following ~~the~~ lesions of the Operculum Rolandicus (up to now described only by Nissl von Meyendorff and a few of French Neurologists) and the second being the efferent (or kinetic) motor aphasia, or the Aphasia of Broca, sensu stricto.

The physiological mechanisms as well as the clinical picture of each of this form is very different.

~~The~~ ^{the} afferent (or kinesthetic) motor aphasia can be ^{accurately characterized, described, understood, or} ~~understood~~ ^{omitted, or} ~~as~~ ^{as} a special form of verbal apraxia. ~~It's~~ ^{THE} ITS ^{system} ~~of~~ ^{of} articules (units of motor speech). In slight cases the patient loses the opposition of ~~the~~ related articules, becoming unable to discriminate related articules as to select the proper articule ~~to~~ from a complex of [palato-lingual] ~~to~~ ^{to} d - l - t or labial b - m - p, although its acoustic discrimination ~~is~~ ^{MAY} of the same sounds ~~could~~ ^{be} preserved or only secondarily deranged.