

Linguistic and Other Psychological Aspects of Paroxysmal Aphasia

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A case of paroxysmal aphasia is reported. Aphasic spells occurred, in this patient, without modification in consciousness and without involvement of behaviors others than those related to oral and written speech and language. Longer spells successively recapitulated the clinical pictures of global, Wernicke's, conduction, and amnesic aphasia. Besides aphasiological evaluations, neurological, psychometrical, electroencephalographical, and CT-scan documents were obtained. The discussion bears on four main points: the linguistic characteristics of paroxysmal aphasia as compared to those of aphasias of other etiologies; Pierre Marie's oneness doctrine of aphasia; the mutual relationships of language and thought (in aphasia); the affective experience lived by one with severe aphasia, with special reference to the notion of anosognosia.

This is a clinical case report: given the present day philosophy of medical research publication, justification of a sort is therefore desirable. The case is one of paroxysmal aphasia (Insert 1), occurring without modification of consciousness (but for tractable initial drowsiness) and without any other neuropsychological impairment that we could recognize. Although paroxysmal aphasia is only relatively infrequent (Bancaud, 1976), this double dissociation is indeed exceptional and, together with the semeiological wealth and length of some of the patient's dysphasic episodes, it provided the ground for gathering exceptional observations in relation to several major problems of aphasiology:

—Since isolated aphasic manifestations could be observed over periods of several hours in the course of some of the patient's transitory attacks, the case permitted diachronic description of a few strictly linguistic aspects of paroxysmal dysphasia (and their comparison to those in dysphasias of other etiologies), thus complementing known clinical descrip-

Research supported by Grant MA-4210 of the Conseil de la Recherche Médicale du Canada. Send requests for reprints to Dr. André Roch Lecours, Neuropsychology Center, Hôtel-Dieu de Montréal, 3840 rue Saint-Urbain, Montréal, Québec, H2W 1T8, Canada.

tions of this condition [of which the best we know is the one by Alajouanine and Sabouraud (1960) (Insert 2)].

—Furthermore, since the patient's linguistic behavior could recapitulate, in the course of a single epileptic spell, the semeiology of several forms of aphasia to which individual labels are usually attributed (global, Wernicke's with anosognosia, conduction, amnesic), the case was particularly favorable to reassessment of the oneness doctrine of aphasia [of which, in our opinion, the clearest formulation by far remains Pierre Marie's (1906)].

—Finally, since the patient could and did resort to standard thinking-speaking abilities, between aphasic paroxysms, in order to think and speak of a repetitive personal experience of [isolated] aphasia comprising a phase of "anosognosia," the case naturally—indeed ideally—led to reconsidering (a) the problem of the mutual relationships of language and thought in aphasia (Alajouanine, 1965; Lecours, Lhermitte, et al., 1979; Lhermitte, 1976; Lhermitte, 1951) and (b) the problem of the affective experience lived by the aphasic (when aphasia occurs isolately) with special reference to the notion of anosognosia.

After a circumstantiated report of our patient's neurological history, we will discuss each of these four problems in turn.

Insert 1

As a fact of physiopathology, *epilepsy* is a sudden, excessive and rapid electrical discharge generated in the gray matter of some part of the brain (Jackson, reprinted in 1958; Penfield & Jasper, 1954). Clinically, such a neuronal discharge can give rise to a *focal seizure* if it does not spread to the rest of the brain. The resulting behavioral anomalies, in such circumstances, are said to be *elementary* if the discharge arises in and remains confined to an area of *primary cortex*, and they are said to be *complex* if the discharge originates from *associative cortex* (Bancaud, 1976). Paroxysmal arrest of speech, unarticulated vocalizations, palilalia, dysarthria, tinnitus, formless auditory hallucinations are eventual examples of *elementary* focal epileptic semeiology. Dysphasia, on the other hand, is an eventual example of *complex* focal epileptic semeiology: its occurrence presumably indicates that the associative cortex generating the electrical anomaly belongs with the so-called *language areas*, usually their posterior temporal components.

Insert 2

Paroxysmal dysphasia usually follows initial alteration of consciousness and very often coexists with nondysphasic symptoms and signs (sensory, motor, and/or psychological). Isolated or nearly isolated dysphasic disturbances witnessing to a focal epileptic discharge without previous loss of consciousness are most uncommon.

Although all types of expressive and receptive, spoken and written dysphasic disturbances can be observed in paroxysmal dysphasia (whether isolated or not), the commonest and most commonly reported one is a word-finding difficulty actualizing a clinical picture of transient *amnesic aphasia* (Alajouanine & Sabouraud, 1960; Chavany, Lobel, & Hagenmuller, 1956; MacRobert & Hens, 1929; Serafetinides & Falconer, 1963; Solomon, 1957; Winkler, Freiman, &

Lieberman, 1951). Such spells are usually of brief duration, lasting only a few minutes. Nonetheless, paroxysmal dysphasic episodes of longer duration and comprising more complex manifestations of linguistic dysfunction can occur. In such cases, Alajouanine and Sabouraud (1960) describe (a) an initial *critical phase*, lasting 3 to 5 min at the most, massively involving language expression and comprehension the way global aphasia does, and concomitant to maximal electrical discharge as witnessed by the scalp EEG; it is followed by (b) a *postcritical phase*, lasting from minutes to hours, comprising a cluster of regressive dysphasic symptoms and signs usually akin to one form or another of *Wernicke's aphasia* (with anomia being the most common, apparent, and persistent deficit), and resulting in relatively little if any scalp EEG anomalies.

CASE REPORT

Brother John is a right-handed 50-year-old who has completed 10 years of formal schooling. Being intellectually inquisitive, he has kept learning since then in the manner of an autodidact. Reading and writing have been part of his daily adult life. For the past decade or so, he has worked on the editorial staff of his order's pious periodical, his main job being to read and answer letters to the editor (up to 55 a day). He considers himself utterly untalented with regard to apprenticeship of foreign languages: indeed, he remains very much of a French unilingual although he has been intensively exposed to both Italian and English for long periods. Brother John has now presented epileptic spells for more than 25 years. He reports no past history of head trauma and, but for his epilepsy, has always been clinically healthy. As several other members of his family, he has long been known to have hypercholesterolemia; his family history is not otherwise pertinent.

In the course of the past 5 years, we have often had the occasion to question and listen to Brother John, to observe and examine him between and during spells.

In the course of longer dysphasic paroxysms. It has been ascertained that he remains conscious throughout the spell provided he or an observer fights initial drowsiness; it has been observed that, although anosognosic for particular linguistic deviations (cf. below), he remains aware of severe language perturbation, is sad about it, and, on occasion, uses tricks deliberately aimed at hiding the fact of a spell actually taking place from those who need not know; the longitudinal evolution of his isolated linguistic impairment has been closely watched and described; he has proven capable of adequate manipulation of relatively complex tools, and of adequate recognition of things and events on the basis of nonlinguistic auditory, visual, or tactile informations; he has also proven capable of carrying on with previously given instructions.¹

¹ Previously given, sometimes several weeks before.

Between dysphasic paroxysms. Free of his linguistic handicap, the patient has often precisely remembered, reported, and discussed events, linguistic and otherwise, that had occurred in the course of a particular spell; having given much thought to his epilepsy and its transient effects on his language and mind, he has volunteered, although he is not a particularly loquacious person, a few introspective comments and opinions which, we believe, are of some interest.

Brother John perhaps presented a first episode of *grand'mal* at age 15, a few hours after receiving local anesthesia for dental extraction. He certainly presented two or three such episodes, at age 20, while on a trip. He was then seen by a physician and told he was epileptic. He has taken different drugs ever since, including phenobarbital, diphenylhydantoin (*Dilantin*), carbamazepine (*Tegretol*), and primidone (*Mysoline*). From then till now, *grand'mal* has recurred only once or twice, but he has regularly presented focal spells the clinical manifestation of which has always been isolated dysphasia. These spells have been of two types: short and long.² Neither includes loss of consciousness; long spells, however, can be accompanied by a desire to sleep which the patient can and often does deliberately fight (an eventual observer will easily awake him should it be necessary).

Short Spells

Short spells last from less than 1 to approximately 5 min and they can occur up to five times a day, without prodroma or aftereffects. Should this frequency increase, Brother John will suspect that a long spell (cf. below) is "on its way." When a short spell takes place, the patient feels bizarre and keeps very quiet; he does not understand spoken language, and he cannot or at least he does not talk; a great many such spells having occurred while he was at his desk, answering the journal's mail, Brother John knows for sure that his reading-writing abilities are then suppressed or hampered. The dysphasic semeiology of short spells, in this patient, is therefore similar to that described in the well-documented case of Boudouresques, Roger, and Gastaut (1962).

Long Spells

Long spells have lasted from 1 to 11 hr, averaging 3 to 4 hr; they occur about 12 to 15 times a year, at unpredictable intervals, *i.e.*, without obvious relations to astral and other meteoric cycles (Brother John has checked this out on various *ad hoc* calendars). The patient believes that most deflections from a sedate and virtuous life are potential triggers of a long spell. A typical long spell will follow one of two schedules: (a) Either

² As is the case of policemen: "*Il y a deux sortes de gendarmes: les courts et les longs*" (Perceau, 1934).

it begins with word-finding difficulties and gradually progresses to a phase of suppression or near suppression with maximal impairment of language comprehension. The latter takes place at about midspell and the intensity of dysphasia thereafter gradually decreases, with word-finding difficulties being the last immediately apparent anomaly to taper off. Or else (b), soon upon waking time as a rule, paroxysmal dysphasia opens on suppression or near suppression with maximal impairment of comprehension, and the evolution thereafter takes place as above. One thus recognizes, at least in the latter pattern, the ictal-postictal dissociation described by Alajouanine and Sabouraud (1960).

Consciousness and awareness. When having reasons not to sleep his spell away, Brother John remains conscious throughout. In the case of a protracted episode, this usually means feeling more and more dejected after a while, sometimes bitterly weeping over mental isolation. It also means, whatever the duration of the episode, being aware of specific perturbation in spoken and written language comprehension and production (although the patient does not know right off if a given attempted utterance or written production of his is adequate or not).³ And, fortunately, it means knowing in advance that linguistic incapacitation shall progressively come to an end. The latter becomes dramatically obvious when the patient syntonizes a tiny transistor radio, carefully kept within hand reach, in deliberate assessment of his oral comprehension capacities; or else, when he goes to his office and looks at the mail to find out if he "can work."

Language. From onset or peak of spell to remission, and for each of the conventional four axes of aphasiological examination, the archetype of diachronic evolution is the following (Fig. 1):

□ With regard to oral expression, a gradually improving reduction (Alajouanine & Lhermitte, 1960, 1963; Lecours, 1975), both quantitative and qualitative, soon follows suppression. In this early phase, the clinical picture sometimes includes a properly arthric disorder (a fact of which the patient remains unaware): either this can only be characterized as undifferentiated mumbling (*marmonnement*), or else it resembles, at least at certain moments, the paretic phase of phonetic disintegration, with slowed and insufficient articulation, production of deviant affricates and pseudodiphthongs, etc. (Alajouanine, Ombredane, & Durand, 1939). Whatever the case, the arthric perturbation tapers back to normal over a relatively brief period (about half an hour), somewhat ahead of reduction

³ The patient's own analysis [in free translation]: "I know that certain words I say are not correct, but I do not know which ones and I do not know how I pronounce them. Sometimes, instead of talking nonsense, I prefer not to talk at all." It occasionally occurs, in the course of a long spell, that Brother John utters a short hackneyed segment in English, a language of which he has very rudimentary knowledge at best: he remains unaware of this and does not remember about it once the spell is over.

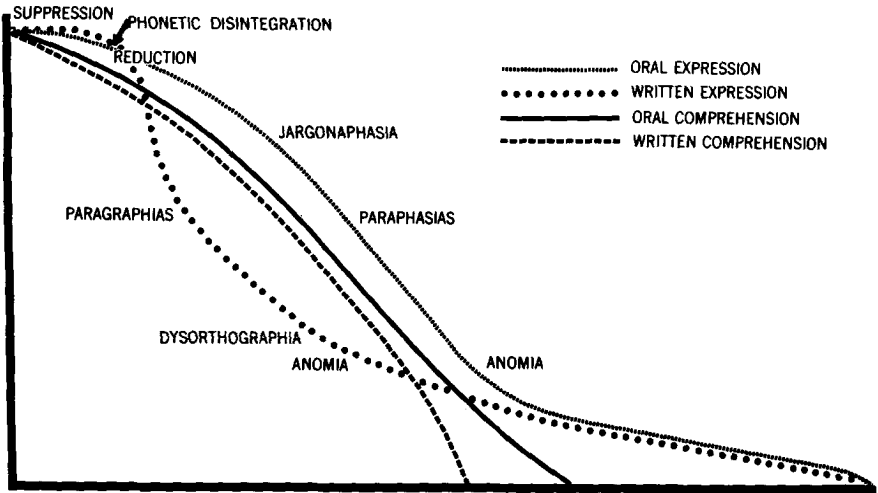


FIG. 1. Archetypical chronology of a long spell.

itself. Aborted sentences [but never agrammatism (Tissot, Mounin, & Lhermitte, 1973)], neologisms, and paraphasias of all types thereafter become progressively more apparent; there comes a point when one is tempted to qualify Brother John's discourse as logorrheic jargon (Lecours & Rouillon, 1975; Lecours & Vanier-Clément, 1976). The following is an example:

- (1) "[gli gliari ari ari ari gliari tylary ary glafy] . . . Là, c'est ↓ c'est ↓ c'est pour faire ça, tu sais, des affaires comme ça. . . . Ah! Je sais pas. Le [f] ↓ euh [glej glijœ glœj glœf lœf larijari] ↓ Tu ↓ tu ↓ du ↓ du ↓ tu ↓ [dijaji dijay dijay djay di tijay tijary]. J'ai euh ↓ j'ai euh mon [lœf lœfy lœfy] ↓ ma euh ↓ c'est pour euh ↓ c'est [lœf] ↓ le [fl] ↓ oui."

It is noteworthy that the jargon period, whether it is logorrheic or not, comprises frequent production of a predilection neologism—[tuware], [tware], [fware], and variants—always the same from one observed spell to another: the patient remains unaware of this particular fact (indeed, he will show surprise when it is later mentioned to him) just as he remains unaware of the anomalous nature of a majority of his deviant productions. The following exemplify the production of the predilection neologism in attempts at naming during the jargon phase:

- (2) The patient is shown a picture of a telephone. He points immediately at the telephone in his room and says: "C'est ça, là. La [furi twar]. Non. [glarity tuware tuwa tuware ari tuware tuware tuwarere tu tuware tu]."
- (3) The patient is shown a picture of a cow and says: "[laf] euh [œf]. Non, [elf tuware tu tylari] ↓ euh [gla elf ulej sœ sœkylytry tuwari te] ↓ euh . . . [tu turuari]. Non, [tu:URU] ↓ Pas capable."

It is also interesting that, throughout the paraphasia-jargon period, Brother John remains capable of fluent nearly nondeviant recitation of long prayers (a fact we have also observed in other nonepileptic jargonaphasic subjects). The jargon will recede in turn, after 1 hr or so. In the process, there can occur a phase during which manifestations of word-finding difficulties and production of phonemic deviations, sometimes with attempted corrections, dominate spontaneous oral production. This is the case in the following utterance where the target segment is "She was coming this way":

- (4) "Elle s'en venait par ici": [elsävneparisi] → "Elle [sävne] ↓ [ävselvã] ↓ [esœlvã] ↓ [esœlvã] ↓ elle [ibytwa] ↓ Elle se ↓ Elle s'en venait par ↓ Elle se *vanait* ↓ Voyons! Elle s'en venait [mar] ↓ S'en venir ici: là!"

From the paraphasia-jargon phases until the end of the episode, observers can evidence the existence of a gradually improving difficulty in word finding: in naming tasks, it is often manifested by neologistic productions in earlier stages [see examples (2) and (3)] and, later, by absences of answers or by production of circumlocutions as well as semantic paraphasias (Lecours, Dordain, & Lhermitte, 1970). The following are examples of the latter:

- (5) The patient is shown a picture of a chair. He first says that he is sitting on one: "Une ↓ Je suis assis dessus, là. (*He laughs.*) (*The examiner utters the initial phoneme: "une [ʃ]."*) Euh [ʃɔnte]. Non. C'est pour s'asseoir . . . sur une euh ↓ sur un ↓ sur un ↓ C'est pas sur une échelle, bien sûr. (*The examiner provides contextual facilitation: "Je m'asseois sur une. . ."*) Je m'asseois sur une chaise! Bon! Le voilà, hein?"
- (6) The patient is shown a picture of a shoe. His answer comprises a compounded semantic and phonemic deviation: "shoe" becomes "sole" and the latter, [sœmel] in French, is transformed into [symel]: "Ca, c'est euh [ɔfäsœjywa] euh ↓ J'ai ↓ J'ai le: [s sy symel symel]; [symel]? Non, la *semelle*, c'est rien que la *chose*, là. C'est ça, ici (*he points at the sole of one of his shoes*). La *semelle* d'un . . . *soulier*! *Soulier*: j'ai de la misère à dire ça: un [rœ] ↓ un [rœ] ↓ un *soulier*: deux *souliers*: il y en a deux."

During the same period, a decreasing production of neologisms, then of phonemic deviations, is observed in the course of repetition tests and, to a lesser degree, in the course of reading (aloud) tests. For instance:

- (7) REPETITION: (*valley*): "vallée": [vale] → [vali].
- (8) REPETITION: (*hideous*): "affreux": [afRø] → [atø].
- (9) REPETITION: (*constitution*): "constitution": [kɔ̃stitysjɔ̃] → [kɔ̃titywɔ̃].
- (10) READING ALOUD: (*yelling*): "criant": [kriã] → [ritã].

□ Written expression semeiology runs a grossly parallel course but there are a few noteworthy differences (Fig. 1): (a) The suppression-reduction phase is longer although perturbations of graphism itself are very discrete if there are any; (b) There occurs no period of fluent deviant written production (spontaneous written production remains scarce throughout); (c) Nonetheless, there comes a phase, corresponding more or less to the jargon phase in oral expression, in which the patient's written output is clearly more communication effective than his (quantitatively greater) spoken output. Somehow, Brother John is aware of the latter since he then spontaneously resorts to paper and pencil rather than talk. We have noted, on a few occasions, that the patient tends to write (and copy) in block letters during earlier phases of his spells and later switches back to his familiar graphic mode, that is, cursives (Fig. 2), a fact that Dejerine and Pierre Marie would no doubt have been delighted to discuss at length (Klippel, 1908). In early phases, Brother John is likely to make errors even in attempts at writing his own name. All types of written output are then involved, copy included, e.g., (11) "POT" → "PET," although to a much lesser degree. As shown in examples already quoted (Fig. 2), e.g., (12) "SUITE" → "SEUITE," writing on dictation leads to production of numerous literal paraphasias. In the following sample, dictated 4.5 hours after the beginning of one of the patient's long spells, a formal verbal paraphasia [(13) "to find" : "RETROUVER" → "to turn over" : "RETOURNER"] occurs together with numerous literal paraphasias (Lecours, Dordain, & Lhermitte, 1970):

- (13) "Plusieurs mineurs sont morts à la suite d'une explosion survenue hier dans une mine de charbon aux Etats-Unis. La cause de l'explosion n'a pas été déterminée. Les équipes de secours ont perdu

1:45 pm PLUSIEURS ~~VERS~~ MINEURES
 SONT ~~ENFEE~~ MORT ~~BIENT~~
 A LA SUITE
 DUNE EXPRETE

2:15 pm PLUSIEUS * MINEURS
 SONT ~~MEEIE~~ MORT
 A LA SUITE ~~DIERI~~
 D'UNE ~~MOEMES~~
 EXPLOSION

2:45 pm Plusieurs mineurs
 sont morts à la suite
 d'une ~~explosion~~ explosion
 survenue hier
 dans une mine

FIG. 2. Writing on dictation in the course of a long spell.

tout espoir de retrouver des survivants.” → “*Plusieur mineurs sont morts à la suite d’une expls exposibl explosions sevenont servenue hier dans une mine de charbon aux Etats-Unis. La cous cause de l’explosion n’a pas été déterminée. Les équipes de so secour ont perdu toutes “exlorce” de retourm retourner retrouver des servivants.*”

On the whole, written production is slow and laborious: for instance, the patient took 8.25 min to write example (13). Oral spelling is proportionally impaired throughout, *e.g.*:

(14) “ARMOIRE” → “A-R-M-O-I-E-T-E-N-E.”

(15) “FÉMININ” → “A-C-R-I-N-O-N-E.”

With regard to written expression, a gradually receding dysorthographia will be the last anomaly to taper away. Indeed, dysorthographia and word-finding difficulties are, and by far, the last evidences of dysphasia to clear: their complete cessation indicates, in other words, the end of Brother John’s long spells.

□ Comprehension of both spoken and written language are massively impaired at peak of spell (in earlier phases, the patient cannot even tell spoken or written French from a foreign language⁴). This perturbation remains obvious until and through the jargon period. It progressively decreases thereafter, usually with a detectable gradient in favor of written comprehension. In oral pointing tasks, we have once noted errors to be somewhat more frequent in the case of morphologically related (linguistic) stimuli than in that of semantically related ones. For instance, (images corresponding to) “APPLE,” “ORANGE,” and “STRAWBERRY” were normally found among “PEAR,” “GRAPES,” “APPLE,” “LEMON,” “ORANGE,” and “STRAWBERRY,” whereas {“RAKE” : [rato]} was mistaken for {“RAFT” : [rado]}, and {“ROBOT” : [robo]} for {“RAKE” : [rato]}, among {“RAKE” : [rato]}, {“CURTAINS” : [rido]}, {“PLANE” : [rabo]}, {“BOUGH” : [ramo]}, {“ROBOT” : [robo]}, and {“RAFT” : [rado]}.⁵ It is therefore noteworthy that repetition is regularly back to normal before oral comprehension. Finally, comprehension of both oral and written language are grossly normal at a time when dysorthographia and dysnomia (word-finding difficulties) are still manifest (Fig. 1).⁶

⁴ Familiar voices, on the other hand, are individually recognized throughout, *i.e.*, the patient then knows who speaks although he usually remains utterly incapable of evoking the speaker’s name.

⁵ No such dissociation was observed in pairing written words to images.

⁶ Brother John’s comments on his difficulty in auditory comprehension (free translation): “I hear noise. I hear people talking. I know it means something but I do not understand. I try hard to understand in my inner self but I cannot. Sometimes, I am able to repeat a word to myself: it can help me to understand.”

Internal language. Although our clinical opinion concerning Brother John's *internal language* during spells obviously resorts to introspection, *i.e.*, to anamnesis, to conversations we had with him at times when his language behavior was normal, the following belongs with the neurolinguistic description of his episodic dysphasia.

Given a restrictive definition of *internal language* as the capacity of any normal speaker to talk to oneself—silently and privately—in words and sentences formally akin to those used in public expression (Sokolov, 1972), Brother John reacts with two main comments: on the one hand, inner and overt expression are proportionally affected throughout his dysphasic spells; on the other hand, coherent thought remains possible in the presence of dysphasia affecting inner as well as overt expression, *i.e.*, in spite of partial or complete incapacity to evoke particular lexical words specifically embodying this thought. He provides examples of the latter. (a) In relation to the day when one of us had driven him to the hospital in the course of a long spell (free translation): "I could not tell you more than I could tell myself but I somehow knew that someone should have informed the janitor that I was leaving the convent; I could think clearly within my inner self but, when it came to [silently] talking to myself, I experienced difficulty finding my words." Or again, (b) in relation to a naming task he had done during a spell and referring to a picture of a TV set (free translation): "I knew what it was—this is why I could point at the TV set in the room—but I could not tell you the word since I could not tell it to myself." We will come back to this problem (inner and overt expression *vs.* thought) after further description of the patient's capacities and incapacities during his spells (*cf.* below). As to his first comment above, it requires further qualification: when Brother John claims adequation between inner and overt dysphasia, he essentially speaks of word-finding difficulties (disponibility or lack of disponibility for public use is in a one to one relationship to disponibility or lack of disponibility for private use, whatever the type of production, *e.g.*, preserved capacity for overt recitation of prayers testifies to equal capacity for silent praying); it is not clear to Brother John, however, if the deviant segments he utters—and of which he remains unaware at least until and through the paraphasia-jargon phases—have or do not have inner equivalents [given examples of his phonemic or verbal deviations, such as (5) and (6), he can conceive of them as events that could also occur in silent speech,⁷ but he has no opinion whatsoever concerning his neologisms, especially the recurrent one].

Calculation. About 3 hr after the beginning of a long spell, as dysphasia was receding but still manifest in both oral and written expression, Brother John was able to write, within 3 to 4 min, the answers to the

⁷ Think of the last lapsus you censored on time.

following written operations (conventionally presented): $(9 + 5)$, $(12 + 14)$, $(17 + 25)$, $(9 - 5)$, $(13 - 12)$, (3×2) , (15×3) , (13×21) , $(6 \div 2)$, $(18 \div 3)$, and $(144 \div 12)$; his written answer to $(35-17)$ was "28." It should be noted that this patient does not do better with repeating and reading numbers aloud than he does with words.

Praxis. Routine apraxia testing was never carried out at peak of spell. From then until the end of the episode, imitations of gestures of the examiner, and later their execution following linguistic command, were found normal whether these gestures were simple or relatively complex, appendicular or axial (mouth and face included), unilateral or bilateral, arbitrary or semantically loaded. Moreover, he remains capable, throughout his spells, of spontaneous actions such as operating an elevator, tuning a radio, using a tape recorder (*i.e.*, inserting a cassette, plugging the microphone, pressing buttons, and rotating knobs in order to listen or record, etc.⁸). Although his copy of a cube was not perfect, he is also capable of—indeed, prone to—tool manipulation, even at times when his comprehension difficulties are very severe: for instance, as a pastime during long spells, he fabricates elaborate montages with elastic bands and cigarette boxes he (carefully and with great precision) cuts up with scissors (Fig. 3).

Gnosis. Routine agnosia testing was never carried out at peak of spell. From then until the end of the episode, such tests (none pertaining to verbal deafness or blindness) did not evidence agnosia in the tactual and visual spheres: nonlinguistic tactile and visual stimuli were properly recognized whenever they could be paired with images or associated to gestures, and some were simply named; although a few nonlinguistic auditory stimuli apparently puzzled Brother John (including the noise of a typewriter, with which he is familiar, the neighing of a horse, and the grunting of pigs), most auditory stimuli were also unambiguously recognized. Furthermore, the patient recognizes—but as a rule cannot name—known people he sees when dysphasic, as well as he recognizes, as witnessed by proper use, daily life objects such as comb and shaver, soap and towels, clothes, utensils and crockery, and so forth. He has been reported to listen to (instrumental) music during his long spells and says the latter do not diminish his (uneducated) capacity to appreciate music and recognize—but for their names as a rule—known melodies. He rightfully states himself capable of recognizing unseen familiar persons by listening to their voices (a nurse talking in the corridor, for instance) or even steps (a colleague who walks with a cane, for instance), although he can be utterly incapable of evoking their names, either for private or for public expression.

⁸ The patient once forgot to depress the "record" button of his taping device.

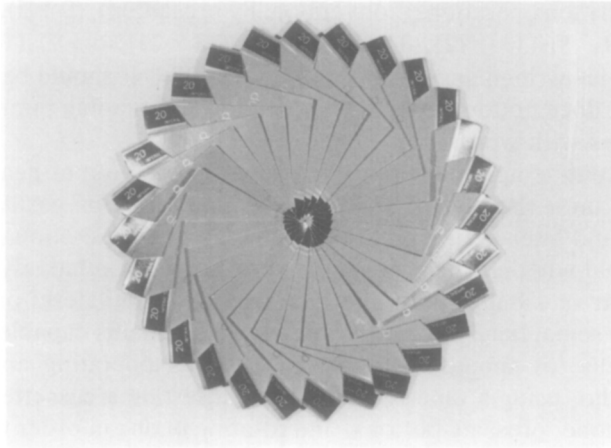


FIG. 3. Example of montage (cut cigarette boxes and elastic band) fabricated in the course of a long spell.

Spatial orientation. In the course of a long spell, Brother John experiences no difficulty with spatial orientation in a familiar building, town, city. In places he has never been before, he will behave normally as long as he does not have to rely on linguistic information, spoken or written. He once had difficulty finding his way in Montréal and later explained: "I knew where to look for the names of the streets, I could see them but I could not read them" (free translation).

Memory. Brother John remains capable, throughout long spells, to remember events—linguistic or otherwise—that have occurred previously. He will therefore carry out, in the course of a dysphasic episode, verbal instructions given days or weeks before: without being capable of any linguistic recapitulation, inner or overt, he has thus carried on with instructions such as sampling his own deviant speech on magnetic tapes, attempting to write a few words at peak of spell, alerting a third party in order to have one of us informed of the occurrence of a severe dysphasic episode. He did the latter a few times by presenting the third party with a previously written note comprising explanations and phone numbers. On the other hand, and although he is anosognosic for particular linguistic deviations (cf. above), the patient will remember and precisely report on events that have occurred in the course of a spell, including those immediately resulting—and this is a causality relationship of which he remains thoroughly aware—from his linguistic handicap: it was for instance the case of the expected visit of friends and the frustration he felt at being unable, because of his dysphasia, to carry on with preestablished plans; or again, it was the case of a phone call he had to answer during a dysphasic episode and of the subterfuge he invented to manage the situation (cf. below).

Thought. When Brother John managed to inform us through a third party, he knew about the meaning of his previously written note, he knew that we would thereafter learn by telephone that he was being sick, and he knew that one of us might come to visit, examine, and test him. When he had to answer the telephone during a spell, he kept repeating "Allo! Allo! Allo!" louder and louder, and the deliberate intention to deceive whoever was calling, that is, to lead him to believe that his interlocutor could not hear because of technical failure in the voice transmission apparatus. When he had visitors during a dysphasic episode, he saw to it that one of his colleagues, already informed of the expected visit, understood he was to replace him beside his friends, guide them to the convent's cafeteria, and entertain them through dinner time. In other words, the occurrence of a dysphasic episode does not prevent Brother John from thinking clearly in relation to co-occurring concrete situations, neither does it prevent him from confronting present to past events, planning accordingly, and acting at best. In this respect, the following anecdote is strikingly demonstrative and, in our opinion, it compels assent as to the language specificity or near specificity of our patient's paroxysmal episodes as well as to his state of mind and mental capacities in the course of such episodes:

While he was traveling by train from Italy to Switzerland, Brother John once found himself at the height of paroxysmal dysphasia soon upon reaching the small town of his destination. He had never been in this town before but he probably had considered in his mind, before the spell began (or became severe), the fact he was to disembark at the next stop of the train. At all events, he recognized the fact he had arrived when the time came. He consequently gathered his suitcases and got off the train and out of the railway station, the latter after properly presenting his transportation titles to an attending agent. He then looked for and identified a hotel, mostly or entirely on nonlinguistic clues since alexia was still severe, entered and recognized the registration desk, showed the attendant his *medic-alert* bracelet only to be dismayed and dismissed by a gesture meaning "no-room" and a facial mimic that perhaps meant "I-do-not-want-trouble-in-my-establishment." Brother John repeated the operation in search of a second hotel, found one and its registration desk, showed his bracelet again, and, relieved at recognizing through nods and gestures that there were both room and sympathy this time, he gave the receptionist (a "fat lady") his passport, indicating the page where she was to find the information necessary for completing his entry file. He then reacted affirmatively to her "do-you-want-to-rest-in-bed-now" mimical question. He was led to his room and given his key; he probably tipped as expected and went to bed. He did not rest long, however: feeling miserable ["It helps to sleep but sometimes I cannot because I am too nervous and jittery" (free translation)], then hungry, he went down to the hotel's

lobby and found the restaurant by himself. He sat at a table and, when presented with the menu, he pointed at a line he could not read but expected to be out of the hors-d'oeuvres and desserts sections. He hoped he had chosen something he liked and felt sorry when the waiter came back with a dish of fish, that is, something he particularly dislikes. He nonetheless ate a bit ("potatoes and other vegetables"), drank a bottle of "mineral water," then went back by himself to his room, properly used his key to unlock his bedroom door, lay down, and slept his aphasia away. He woke up hours later, o-kay speechwise but feeling "foolish" and apologetic. He went to see the fat lady and explained in detail; apparently, she was compassionate.

Between Spells

General medical examinations have never yielded significant information as to Brother John's epilepsy. Neurological examinations have remained normal between full blown spells.

Aphasia tests. Exhaustive aphasia testing has been carried out on several occasions between full blown spells. As compared to that of standard speakers of comparable age and sociocultural background (Hubert & Laramée-Essiambre, in press), the behavior of Brother John has then always been found to be within normal limits. The results of these tests, nonetheless, compared to one another, have twice shown a minimal deficit in naming (mostly latencies) and a mild degree of dysorthographia, leading mostly to production of literal paraphasias by regressive or progressive assimilation of a letter [e.g., (16) "CHEVAL" → "CHAVAL", (17) "DESCEND" → "DECCEND", (18) "PENDANT" → "PENDAND"], less often to production of graphemic paraphasias with replacement by one another of graphemes potentially representative of a same phoneme [e.g., (19) "CAFETIÈRE" → "CAFETIAIRE"] (Lecours et al., 1970). Brother John was aware of this on both occasions and he spontaneously attributed his difficulties to weariness. Indeed, he has a name (!) for this, which he considers to be different from both his short and his long spells: he talks of his "fatigues" (*mes fatigues*), states that they can last for "quite a while" (several hours, that is), and has observed that they occur when he is tired or "uneasy in [his] mind." He comments that the latter might be an effect rather than a cause. Brother John's "fatigues" obviously correspond to attenuated long spells (Fig. 1), limited to mild anomia and dysorthographia, *i.e.*, to those two semeiological elements that are the very last to clear at the end of full blown long spells [and the very first to appear in episodes with progressive onset (cf. above)].

Psychometrics. Brother John has undergone extensive psychometric testing (between spells). A certain discrepancy was found between Wechsler's verbal and performance intelligence scales, somewhat unex-

pectedly in favor of the former (VIQ: 114; PIQ: 102), and also between Wechsler's intelligence and memory scales (IQ: 113; MQ: 99). Raven's progressive matrices (PM-38; ensembles A, B, C, D, and E) were twice passed at the 75th percentile. The copy of Rey's complex figure was normal (90th percentile); reproduction from memory was poor (<10th percentile). Several other tests yielded abnormal results including, from Reitan's battery (Reitan & Davison, 1974), the manual finger tapping test (right: 33; left: 35), the trail-making test (part A: 8; part B: 2), Halstead's category test (64 errors), Kohs' cubes (67), and the tactual performance test (total time: 7 min, 12 sec; memory: 6; localization: 2). Obtained at times when aphasiological and routine neurological examinations were normal, these results were considered to be consistent with organic brain damage.

Paraclinical data. But for confirming the existence of hypercholesterolemia (triglycerides: 157 mg%), routine biochemical tests were not contributive. Simple skull X rays and γ -encephalograms were normal. CT scans showed the left lateral ventricle to be slightly larger than the right one, with both sylvian fissures visualized, symmetrical and normal; these images were interpreted as being within normal limits, showing in particular no evidence of a space-occupying lesion. Electroencephalograms were recorded on several occasions since 1974: (a) Standard recordings were always normal between spells; (b) sleep recordings between spells evidenced focal epileptic activity of the spike-and-wave type, maximal over F7-T3 (standard electrode placement); (c) recordings in early postictal phase, while the patient was awake and still severely dysphasic, showed slow waves and a few spikes over the left hemisphere, with maximal anomalies over the anterior and midtemporal regions, and spreading to posterior temporal, frontal and, to a lesser degree, centroparietal regions.

COMMENT

Linguistic Aspects of Paroxysmal Dysphasia—Typology of Deviant Segments

Qualitatively, the deviant segments we have recorded during Brother John's epileptic spells do not differ from those observed in dysphasias of other etiologies (Lecours, et al., 1970). They include phonetic distortions that are sometimes akin to those linked to the paretic phase of the phonetic disintegration syndrome (Alajouanine et al., 1939), phonemic paraphasias [(4)–(10)], and dysorthographic deviations {literal paraphasias [(12), (13), and (16)–(18)], graphemic paraphasias (19), complex errors in oral spelling [(14) and (15)]}, formal verbal paraphasias [(4) and (5)] and paraphasias [(11) and (13)], semantic paraphasias (6), use of *passe-partout* words such as "*affaires*" [things] (1) and "*chose*" [thing] (6), production of neologisms {oral [(1)–(3)] and written (Fig. 2)}, of

circumlocutions (5) and of aborted sentences (1) testifying to the existence of severe word-finding difficulties. Considered quantitatively and within the diachrony of the patient's full blown long spells (Fig. 1), these deviant outputs successively recapitulate, as it were, the linguistic profiles of several clinical forms of aphasia (Lecours & Rouillon, 1975; Lecours & Vanier-Clément, 1976). Thus, in the course of spells beginning right off with maximal deficit:

—severe *global aphasia* (suppression → severe reduction, phonetic distortions); then improving *global* or *mixed aphasia* (reduction, production of neologisms and paraphasias in the absence of phonetic distortions);

—then *Wernicke's aphasia proper* {neologistic jargon with logorrhea (1), use of a predilection neologism [(2) and (3)], production of paraphasias and paragraphias of all types in naming, repeating, reading, writing [(6) and (14)]; (Fig. 2)}; then *Wernicke's aphasia* with relatively lesser involvement of written than of oral language, a clinical status to which Dejerine (1926) gave the name of *Wernicke's word deafness* (as opposed to *pure word deafness*);

—then *conduction aphasia* {predominance of phonemic deviations—phonemic paraphasias and formal verbal paraphasias—in oral expression [(4), (5), (7)–(10)], and of dysorthographic deviations and formal verbal paragraphias in writing (13)};

—then and finally *amnesic aphasia* {word-finding difficulties and dysorthographia [(16)–(19)]}.

In clinical aphasiology, it is not uncommon to observe patients with *global aphasia*, usually the result of CVA or trauma, whose evolution is such, as to improvement of oral comprehension, that the original label can be changed to that of *Broca's aphasia* after a few weeks or months (if one does not insist on having the patient submitted to comprehension tests above the elementary level): after all, this was almost certainly the case of Paul Broca's famous *Monsieur Tan* (Leborgne) (Broca, 1865). But unless one considers cases of *Wernicke's aphasia proper* following initial suppression of very short or short duration (Marie & Foix, 1917), which by the way is not at all a rare occurrence, it is very uncommon for a clinical aphasiologist to say of the same patient that he has had *global aphasia* first and *Wernicke's aphasia proper* a little later: as compared to the above on *global* and *Broca's aphasias*, this might of course be entirely due to timing of events, for instance, suppression having been replaced by florid jargon by the time one comes to writing the conclusions of one's consultation (if not spectacular or supervening upon a background of platitude, things have to last a while in order to be given names). Be that as it may, and whether one does or does not have the habit of reconsidering labels with time passing and behaviors changing, the succession of events observed in the course of Brother John's long spells, from the

jargon phase until the end of the episode (*Wernicke's* → *conduction* → *amnesic*), is comparable to that observed in many a patient displaying favorable evolution after a CVA or trauma responsible for left temporal damage. Indeed, the only important difference, from an aphasiological point of view, is that the paroxystic diachrony is very much briefer (as could also be the case, we presume, in certain instances of transient ischemic attacks) (Lecours et al., 1979). Favorable evolution of *conduction to amnesic aphasia*, usually after an embolism to the left supramarginal region, is also well known.

If the above considerations apply to aphasias of abrupt onset and favorable evolution, *i.e.*, in most cases, to aphasias resulting from CVAs or head traumas, one might add that the diachrony observed in linguistic perturbations during those of Brother John's long episodes which begin insidiously, does recapitulate, following an accelerated tempo from onset to peak of disturbance, language events one sometimes manages to distinguish within the proteiform neuropsychological disorders often linked to degenerative diseases or left brain tumors.

Brother John and Pierre Marie's Oneness Doctrine of Aphasia

Although we subscribe only in part to Marie's views on aphasia (as he probably did himself), we believe they constitute a good scheme of reference in discussing Brother John's case. Let us first consider *Pierre Marie's law* (Marie, 1906, 1926):

APHASIE DE BROCA = APHASIE + ANARTHRIE.

Now, Marie is explicit as to "*aphasie*" and "*aphasie de Wernicke*" being absolute synonyms in his terminology: "*L'aphasie de Broca, c'est l'aphasie de Wernicke avec la parole en moins*" (Marie, 1906). One can therefore rewrite the *law* as follows:

APHASIE DE BROCA = APHASIE DE WERNICKE + ANARTHRIE.

And since the clinical picture to which Marie referred when talking of "*Broca's aphasia*" is clearly what most clinicians nowadays refer to as *global aphasia*, reserving the label *Broca's aphasia* (or motor aphasia) to designate a semeiological constellation comprising no gross deficit in comprehension (at least in oral comprehension), the *law* can also be rewritten as follows:

APHASIE GLOBALE = APHASIE DE WERNICKE + ANARTHRIE.

But then, what Marie meant by "*anarthria*" is not readily apparent although the word itself is quite clear (etymologically). Rereading his papers on aphasia (Marie, 1926) has convinced us that his "*anarthria*" is not to be equated with a single form of limited output but covers, besides mere suppression, at least two phenomena that are distinct since they sometimes are not co-occurrent: on the one hand, the productions of patients with (eventually severe) phonetic disintegration, that is, outputs limited by properly arthric disorders (Alajouanine, et al., 1939;

Alajouanine, Pichot, & Durand, 1949; Lecours & Lhermitte, 1976); on the other hand, the productions of patients whose discourse, although very scarce, is nevertheless unhampered by phonetic disintegration, that is, remains phonetically rule governed (Lecours & Vanier-Clément, 1976). [Following Alajouanine and Lhermitte (1960), we will refer to the latter type of limited output as "reduction."⁹] Therefore, *Pierre Marie's law* can be rewritten again, this time in three different manners:

- (i) *APHASIE GLOBALE = APHASIE DE WERNICKE + RÉDUCTION + DÉSINTÉGRATION PHONÉTIQUE;*
- (ii) *APHASIE GLOBALE = APHASIE DE WERNICKE + RÉDUCTION;*
- (iii) *APHASIE GLOBALE = APHASIE DE WERNICKE + DÉSINTÉGRATION PHONÉTIQUE.*

Over the years, we have observed only two patients with severe comprehension disturbances and rather fluent neologistic jargon co-occurrent with some degree of phonetic disintegration (or a behavior akin to it), that is, two patients actualizing reformulation (iii) above. They were the source of interesting but inconclusive discussions on lesion localization and physiopathology.¹⁰ Reformulations (i) and (ii), on the other hand, are obviously possible representations of global aphasia as commonly observed and labeled in the neurological wards. They both apply—successively: (i), then (ii)—to the early phases of Brother John's full blown long spells (those immediately following suppression) provided (a) the patient's transient arthric deficit is assimilated to phonetic disintegration (which is apparently the case in certain spells whereas the arthric disorder might better be described as undifferentiated mumbling in others), and provided (b) one accepts, as we do, *Pierre Marie's law's* implication that the expressive semeiology of global aphasia (reduction, in particular), prevents the actualization of expressive semeiology of the Wernicke type (fluency in jargon, that is). By reference to this conceptual framework, Wernicke's aphasia does exist at the height of Brother John's spells, but it is hidden, so to speak; its clinical manifestations will take place only in the course of later stages, with progressive tapering of the arthric disorder and, above all, of reduction (cf. above) (Fig. 1). Therefore, actualization of fluent jargon, although a spectacular evidence of

⁹ Phonetic disintegration without reduction and without comprehension disturbances is observed in so-called pure anarthria (Lecours & Lhermitte, 1976). Reduction without phonetic disintegration and without major comprehension disturbances is observed in transcortical motor aphasia (Wernicke, 1876). Reduction and phonetic disintegration without major comprehension disturbances are observed in Broca's aphasia (Alajouanine & Lhermitte, 1960), a not so common condition in our opinion.

¹⁰ Without really forgetting about these two observations, we have somehow managed, until recently, to set them apart among those—rather numerous indeed—we avoid overpondering (for the sake of serenity in our teaching of aphasiology).

severe dysphasia, is also—in this case—an indication of improvement of dysphasia.

Involvement of all but the properly phonetic and graphic aspects of linguistic behavior, during Brother John's Wernicke phases, is also in line with Pierre Marie's doctrine: '*l'aphasie de Wernicke est un syndrome qui apparaît avec tous ses éléments dès qu'il existe une lésion, même limitée, de la zone de Wernicke, en un quelconque de ses points*' (Marie, 1906). Further evolution, however, shows semeiological dissociations which Marie (at least) implicitly rejected in his earlier writings. One of these dissociations corresponds to a more or less definite lack of synchronization in recuperation of spoken *vs.* written expression and comprehension, the latter improving for a while somewhat ahead of the former (Fig. 1); another, usually more readily apparent and taking form a little later in the diachrony of a typical episode (when both oral and written comprehension are nearly back to normal), occurs when production of phonemic deviations—more so in spontaneous and repeated speech than in reading—takes relative predominance over production of other types of deviant segments. The first of these dissociations is not really uncommon, as Wernicke taught, in patients with focal lesions limited to the left temporal lobe and a relatively good cultural background with regard to written language (reading and writing) (Wernicke, 1874); the second one is still more frequent in Wernicke's aphasia proper with favorable evolution (*i.e.*, with evolution towards a clinical picture assimilable to that of conduction aphasia, later to that of amnesic aphasia). Had he eyed aphasia less statically, and acknowledged the existence of such dissociations [as he was to do some 10 years later with Charles Foix, after observing aphasia in young people with gunshot wounds of the brain (Marie & Foix, 1917)], Marie might indeed—arguing that these dissociations can and often do represent the natural evolution of full blown Wernicke's aphasia—have interpreted them as further ascertainment of his oneness doctrine of aphasia.

Language and Thought in Aphasia

As most of his contemporaries, Marie maintained that aphasia—that is, to him, Wernicke's aphasia—proportionally affects both overt and internal language. If his notion of internal language was restricted to one's capacity of silently and privately talking to oneself in words and sentences, following the same linguistic conventions that govern one's public talking, his opinion on this problem is entirely shared by Brother John. The relation is one to one according to the latter: any conventional or deviant, complete or aborted unit or string of articulated language he can formulate internally, for private use, is disponible for public, overt, exter-

nal articulation (cf. above), this throughout his dysphasic episodes.¹¹ Nonetheless, there is one aspect of Wernicke's aphasia proper on which Brother John finds himself in agreement with Lordat (1843/1844), another victim of transient aphasia and source of introspective considerations, with Broca (1865), Wernicke¹² (1874), Dejerine (1906, 1926), Geschwind (1965), and Lhermitte (1976), rather than with Trousseau¹³ (1877), Marie (1906, 1926) (well, one cannot always be right), Head (1926), Goldstein (1948), and Bay (1964): he believes that aphasia as he has lived it over and over again, that is, isolated aphasia, however severe, is not to be equated with intellectual deterioration. To him (and to us, as a matter of fact), this means that, given a situation taking place in the course of a long dysphasic spell, he will try to manage at best without language (as you did during your last sojourn in Tirana), *i.e.*, he will rely on past experience (including language-mediated apprenticeships and knowledge of his own and other people's reactions to aphasia), on retained capacity for actual analysis of nonlinguistic information and for action, and on retained capacity for anticipating results of action or lack of it. Brother John maintains, for instance, that he need not tell himself the words "tape recorder," "magnetic tape," "red button on the left," "turn," "push," and so forth, nor any sequential arrangement of these words into appropriate phrases and sentences, in order to be capable of properly operating a tape recorder; whether or not these words and sentences are partially or totally dispoible to internal formulation will make little difference as to the end result. Although we were not able to determine what Brother John thinks of the eventual effects of absent or deviant internal language on clarity in programming, on incidence of trials and errors, on duration of action and so forth, we tend to consider his assertions on intelligence and aphasia as essentially correct: his handling of the Switzerland loophole (cf. above) is, in our opinion, rather convincing in this respect. Apparently, Brother John—like Köhler's chimpanzee, Sultan (Köhler, 1951; Lhermitte, 1976)—is not missing language to think properly and act effectively in given situations; on the other hand, he sure is missing language to properly tell us about it right off. We are not so convinced, however, that Brother John could, in the course of one of his long dysphasic episode, sit down with his eyes closed and reflect on Thomas Aquinas' *De Ente et Essentia* (1254/1255), and we do not know how he would manage (presum-

¹¹ Brother John does not know, however, if overt deviations—of which he usually remains unaware—correspond to inner ones; of course, we cannot answer the question for him, but we know as he does that phonemic and verbal deviations—a proportion of which one conceivably remains unaware—do occur in silent private speech.

¹² As pointed out by Hécaen (1972), Wernicke believed that defining aphasia as a form of intellectual deterioration would inevitably lead to disastrous biases in pursuing aphasiological research.

¹³ "L'aphasique boîtera toujours de l'intelligence" (Trousseau, 1877).

ably) nonverbal learning while being dysphasic. We plan to try and find out about the latter.

Having Aphasia with Anosognosia

Brother John produces, during the reduction–paraphasia–jargon phases of his long dysphasic spells, an increasing amount of deviant utterances of all types (*cf.* above). He then has no awareness of the anomalous nature of these utterances. This is obviously anosognosia (although it is not denial of disease). On the other hand—and the patient is peremptory on this—he remains aware, throughout his spells, that something is going very much astray in his linguistic behavior. Although this awareness is probably enhanced by what Brother John has learned of aphasia over the years [*i.e.*, although it might up to a point be linked to exceptional etiological factors], he takes it to be founded on actual more than on past experience of aphasia. In his opinion, it is the handicap in communication and this handicap alone which often leads him, though he knows about its transitory nature, to feel dejected and sad, sometimes to cry overtly. He considers the latter to be an appropriate reaction, a relieving one within certain limits, and he does not agree that it might be the result of some form of “emotional lability.” Well, we have seldom felt like giving much credit to introspection on aphasia; we are not suggesting that Brother John’s anosognosia is the archetype of anosognosia [although we have observed several logorrheic jargonaphasics (CVAs and traumas) whose heavily deviated discourse made it clear at times that they were not totally unaware of disturbance in language production], and we do not deny that emotional lability sometimes witnesses to bilateral brain damage. All the same, we have lately found it an adapted attitude, when dealing with global or with logorrheic Wernicke’s aphasics, to recapitulate some of the comments Brother John has made, between his dysphasic spells, about his moods, feelings, and situational awareness during his spells.

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