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'Talking heads' or the naturalisation of language at the end of the 18th century

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> Das Verfahren unseres Geistes, besonders in seinen geheimnisvolleren Wirkungen, kann nur durch tiefes Nachdenken und anhaltende Beobachtung seiner selbst ergründet werden. Aber es ist selbst damit noch wenig geschehen, wenn man nicht zugleich auf die Verschiedenheit der Köpfe, auf die Mannigfaltigkeit der Weise Rücksicht nimmt, wie sich die Welt in verschiedenen Individuen spiegelt.
> (W. v. Humboldt, *Über die Bildung des Menschen*, 1794)[1]

1. The 'inner sense' as a blind spot in epistemology, anatomy and physiology

Following on the older *sensus communis*, the concept of the 'inner sense',[2] which assembles perception, imagination, consciousness, reflection, memory and sometimes language faculty in an elegant construct, became an increasingly disturbing 'blind spot' in 18th century epistemology. Locating that construct in the brain didn't remove its opacity, neither that of the 'inner sense' nor that of the brain, simply because the brain functions were more or less 'terra incognita' at that time. The problem became evident in the last decades of the 18th century when anatomists and physiologists tried to deliver empirical proof that the

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[1] Humboldt, *Werke*, ed. Andreas Flitner and Klaus Giel, vol. 1, Darmstadt 1980, 239

[2] The concept of 'inner sense' figures among others in contrasting theories like in Leibniz ("Comme donc nostre ame compare […] il faut bien qu'il y aît un *se*ns interne, où les perceptions de ces différens sens externes se trouvent reunites. C'est ce qu'on appelle l'imagination, laquelle comprend à la fois les notions des sens particuliers, qui sont claires et confuses, et les notions du sens commun, qui sont claires et distinctes." (*Phil. Abh*., ed. Gerhardt, vol. 6, 501) or Locke ("[...] I call this [the internal sense, J.G.] REFLECTION. By REFLECTION then […] I would be understood to mean, that notice which the Mind takes of its own Operations […]." Locke, *Essay*, ed. Nidditch, Book II, ch. l, § 4. Oxford 1990, 105).

cognitive faculties of man were not (or not only) a property of mind, but a function of the brain.[3]

The inclusion of the brain within the organic ensemble of the human body as the physical and physiological basis or substratum of the 'inner sense' transformed Descartes' mechanistic constructions and similar results of an *anatomie métaphysique* into an organ, which consequently was subjected to anatomy and physiological investigation.[4] To avoid the crucial dualistic trap, the 'organ of the soul', the *Seelenorgan* in the German discussion, could mean either that the brain is the organ of an immaterial soul (e.g. Hartley 1749)[5] or the organic materialization of the soul itself. (cf. La Mettrie 1774, 299, Soemmering 1796).

One of the leading anatomists at the end of the century, Vicq d'Azyr, published dissections of different layers of the brain, starting from the blood-vessels covering the skull and proceeding to the cortex and the subcortical structures, and of vertical dissections through the grey and white matter. Vicq d'Azyr was able to show the layered deep structure of the brain, but even a well-prepared cut wouldn't show structures capable of serving as organic foundation or ground of mental processes. Consequently he gave only little attention to the 'inner sense' in his *Plan de l'anatomie*, which was published in the *Encyclopédie Méthodique* and elsewhere. He made clear that at his time anatomy was not able to shed any light on mental faculties labelled 'inner sense'.[6]

Others were more courageous. In order to understand brain functions, Cabanis referred to the analogue of the human digestive apparatus.[7] As the stomach

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[3] Cf. Kant on the 'inner sense' in *Anthropologie in pragmatischer Hinsicht* (*Werke 10,2*, 427; 456 ff.). In his unpublished manuscrit *Vom inneren Sinne* (Loses Blatt Leningrad 1), Kant deals with other aspects, i.e. the inner perception of time and space..)

[4] Vgl. Michael Hagner, *Homo cerebralis. Der Wandel vom Seelenorgan zum Gehirn*, Frankfurt/M.-Leipzig 2000, 28 ff.

[5] "[…] the whole medullary substance of the brain, spinal marrow, and nerves, is the immediate instrument of sensation, and equally related to the sensitive soul, or principle." (Hartley, *Observation on man*, London 1749, [6]1834, 20). Cf. Ann Thomson, *Bodies of Thought. Science, Religion, and the Soul in the Early Enlightenment*, Oxford 2004

[6] Vicq d'Azyr, Art. Anatomie. *Encyclopédie Méthodique. Medécine*, vol.2, Paris 1790, 597.

[7] "Pour se faire une idée juste des opérations dont résulte la pensée, il faut considérer le cerveau comme un organe particulier, destiné spécialement à la produire; de même que l'estomac et les intestins à opérer la digestion, le foie à filtrer la bile, les parotides et les glandes maxillaires et sublinguales à préparer les sucs salivaires, Les impressions, en arrivant au cerveau, le font entrer en activité; comme les alimens en tombant dans l'estomac, l'excitent à la sécrétion plus abondante du suc gastrique et aux mouvements qui favorisent leur propre dissolution. La fonction propre de l'un est de percevoir chaque impression particulière, d'y attacher des signes, de combiner les différentes impressions, de les comparer entre elles, d'en tirer des jugemens et des déterminations; comme la fonction de l'autre est d'agir sur les substances nutritives, dont la présence le stimule, de les dissoudre, d'en assimiler les sucs à

digests different foods, so the brain is able to 'digest' different perceptions – luckily we are spared the ultimate consequence of this analogue. Cabanis' organologic reformulation of Condillac's *sensations transformées* is a cul-de-sac rather than a promising direction to bridge the gap opening up between epistemology and physiology (or Kant's pragmatic [= philosophical] and physiological anthropology). More convincing had been Mendelssohn's and Herz' proposal in their critique of Condillac's and Bonnet's model of the ‘sensitive statue’. They suggested that the mental processing of different sensations should be something like a mutual translation or a re-translation into a common basic script (*Urschrift*) that was in some way transformed into ideas.

Why does that idea appear more far-reaching than the organologic analogue à la Cabanis? Because Mendelssohn and Herz described the transformation from physical sensation to (mental) reflection not as a chemo-physical process but a cognitive activity based on knowledge, memory and structured (rule-guided) symbolization. However the crucial issue remains: how to find empirical evidence for the physical nature of mental processes?

In his *Anthropologie in pragmatischer Hinsicht* (1798) Kant refused to waste time on any theoretical speculation ('*theoretisches Vernünfteln*') on an organic foundation of cognitive faculties like memory and put *physiological* anthropology aside.[8] His verdict was also directed against the Austrian anatomist Franz Joseph Gall, who proposed an alternative approach to connect sensation with reflection or the senses with the brain. Giving up the holistic concept of the brain, which corresponded to the idea of an 'inner sense', Gall preferred a horizontal view of its surface, mapping different mental abilities like memory, speech etc. to areas of the cortex. According to Gall, different regions, which look differently, had different functions. As anatomist, his sections were vertical, starting from the basal joint up to the cortex.

As Gall claimed in a retrospective narrative of his findings, his idea of localization came into his view observing a friend who showed exceptional language faculties and a peculiar shape of the skull. The focus on language was not coincidental because speaking and writing were the easily observable manifestations of cognitive processes. More than that: language as a well-structured, rule-based and creative means of human communication could serve

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notre nature." Cabanis, Pierre-Jean-Georges, *Rapports du physique et du moral de l'homme*, vol.1, Paris [2]1805, 152 f. On Cabanis, cf. Tobias Cheung's paper *Acts, conditions, states: human spheres and the inside-outside-problem of organisms around 1800*, for a historical survey of the debates on the nervous system cf. Georges Lantéri-Laura, Psychiatrie et connaissance du système nerveux central: quelques aspects historiques. *L'Information Pychiatrique*, vol. 80,8, 2004.

[8] Cf. Hagner 2000, 103 ff.

as a modelling metaphor for such processes as described in Mendelssohn's und Herz' texts published in the *Magazin zur Erfahrungsseelenkunde*.

That leads me to my first suggestion: to reconstruct the epistemological debate on perception and ideas throughout the 18th century as a more or less subcutaneous debate on language.

2. Epistemology and language: systematic and genetic examination of l'homme sensible

Already in the debate following the famous Locke-Molyneux's problem at the end of the 17th century and especially after the cataract operation of a blind-born boy by the English surgeon Cheselden (published in 1729), language related activities served as a model for perception. Voltaire supported Locke's view and compared the ability to perceive objects visually with reading und speaking: "Nous apprenons à voir, précisément comme nous apprenons à parler & à lire." (Voltaire, *Elemens de Philosophie de Newton*. *Oeuvres*, 42, 126) Hemsterhuis (1772) and others pointed out that language was necessary to fix ideas – an argument which undermined the validity of the experiment, because *asking* the boy which name he would attach to the two objects he knew before by touch and now had seen after the operation, 'cube' or 'sphere', meant talking about semantics and not or not only about visual perceptions.

Discussing things further, Diderot tried to figure out the connection between perception and ideas by eliminating visual or auditory sensation respectively. Both hypothetical figures, the blind and the deaf and dumb as sophisticated replicas of Condillac's statue, sort of 'talking figures', which expressed their ideas in spoken or sign language.

In his *Lettre sur les aveugles*, Diderot put forward the crucial question how the blind mathematician Saunderson could be sure that he and his unimpaired students were talking about the same objects, when discussing geometrical figures like squares and triangles, which he had constructed on a wooden board with nails and threads and which he could only identify by touch. Diderot's answer was: Saunderson and his students belonged to the same conversational community, which understands what is said.[9]

Some decades later, Karl Philipp Moritz made his point of observing the intellectual properties and the development of a young 'deaf-mute' from the

[9] Cf. Gessinger, Joachim, *Auge und Ohr. Studien zur Erforschung der Sprache am Menschen 1700-1850*, Berlin-New York 1994, part 1, chapt. 1-6.

Berlin Charité and published the observational reports in his *Magazin zur Erfahrungsseelenkunde*.

The genetic issue of the origin of language and language acquisition played a similar important role. Victor of Aveyron might be regarded as the anthropological twin of Cheselden's blind, Condillac's and Bonnet's sensitive statues, Diderot's mental figures, and others, because in Victor most of the empirically vague claims about the connection between sensation, perception, ideas and the unfolding of cognitive and linguistic competence could be observed on a living object in a partly controlled situation. Not by chance Moritz put the anthropological motto '*Gnothi S'auton*' on the frontispiece and in the title of his *Magazin zur Erfahrungsselenkunde*,[10] which featured many examples of observations and self-observations regarding the inner and outer state of body and mind.

3. Anthropology, physiology and language

Things were much more difficult when it came to the physiological foundation of language. Until the middle of the 18th century, the nature of speech, articulation and phonation was far from fully understood.[11] By means of mechanical constructions and musical instruments as analogues, some features of spoken language could be made audible and visible. Writing was considered as a secondary representation of sound and so easy to analyse that the general view on spoken language passed through the 'eyeglasses of script'. Even phoneticians used the model of a limited set of characters to describe the sound inventory of a given language. Describing sound production was an ambitious goal, but it was much harder to describe the production of sounds, their combination to words and to sentences as a physiological based process, in short: the very nature of linguistic competence.

This problem was tackled in two ways: in linguistics (*avant la lettre*), that means the study of language variation and change, the synchronic analysis of linguistic structures (phonology, morphology and grammar) and comparative typology. Neuroanatomy explored the physical conditions of linguistic competence. I will discuss that program later and start to outline some problems anthropology and linguistics had in common and which had been discussed by Wilhelm von Humboldt.

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[10] *Gnothi S'auton oder Magazin zur Erfahrungsseelenkunde als ein Lesebuch für Gelehrte und Ungelehrte*. Mit Unterstützung mehrerer Wahrheitsfreunde herausgegeben von Karl Philipp Moritz, 10 vols., Berlin 1783-1793.

[11] Cf. Gessinger op. cit., part 2.

3.1 Anthropology and language study: Humboldt's *Plan einer vergleichenden Anthropologie* and the study of language(s)

As a result of field research on occasion of ethnographic voyages and reports of Christian missions (e.g. Lorenzo Hervas y Panduro, Carsten Niebuhr, Johann Christoph Adelung, Johann Severin Vater, Peter Simon Pallas und Alexander v. Humboldt), the focus was put on the diversity of habits, customs, economies, arts et métiers, religions, rituals and languages. Diversity tended to unsettle the general assumption of 18th century epistemology, i.e. the uniformity of the sensorial and intellectual faculties of man. Individuals look differently, behave differently and use different languages, which sound differently despite their uniform organic endowment. Is it because of exogenous factors like climate or education or is there physical or physiological evidence to answer those intriguing questions?[12]

Seen from a (mono)genetic perspective diversity means *variation*. Variation was a challenge for anthropology, natural history and linguistics: how to give an evidence-based description of the primary form, which was supposed to be the starting point of further variant development. From a systematic or comparative perspective the task wasn't less demanding: is there a common set of features in variant forms, which are observable at the present time?

Last but not least: Is there a necessity to revise the categories of an epistemology, which was conceptualized to be based on generally invariant mental procedures like chaining of ideas, comparison and memory, and which classified deviant forms of thinking as wrong, mentally ill, troubled or absent, but not as being different and as evidence of alterity?

In linguistics, those questions led to a double approach: a historical and comparative perspective on languages. This paradigm, which prevailed the early 19th century, had its parallel in anthropology, when Wilhelm v. Humboldt tried to close the widening gap between *philosophical* and *historic-empirical anthropology*.

In a letter to the Swiss academic Johann Samuel Ith,[13] which precedes his unpublished fragment *Plan einer vergleichenden Anatomie* (about 1797), Humboldt used the formula of a '*verschieden modificiertes Ganzes*' to reconcile the idea of humankind as a unified whole with the experiential manifold. His

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[12] On the empirical basis of ethnic description and classification cf. Maie-Noëlle Bourguet's paper on this conference.

[13] Ith had published his *Versuch einer Anthropologie, oder Philosophie des Menschen nach seinen körperlichen Anlagen* in 1794.

program was to analyse that manifold of human nature in its ideality; that means to investigate how this ideality of humankind, for which only *one* individual never adequately stands, can be represented by *many*.[14] Consequently anthropology should not limit its methods to pure philosophy and speculation but should become familiar with a strict observation of reality and even start with it. Moreover, without empirical observation the ideal of human nature will be of no practical use for real life.[15] Humboldt conceptualized the individual character as a result of the constant effect, which ideas and sensations impose on human faculties.[16]

The synthesis of the ideal form and the variety of observed phenomena found its echo in Humboldt's philosophy or theory of language and in his program for comparative and historical linguistics, outlined in his academic lecture *Über das vergleichende Sprachstudium […]* (1820). According to Humboldt, the study of language should consist of two main components: the analysis of the 'organism' of languages and their historical development. The language 'organism' has its source in the capacity and need of speech and is part of the 'physiology' of the human intellect. The metaphors 'organism' and 'physiology' have been borrowed from physiology as one of the leading sciences at the turn of the century, but their referents are just the opposite of organic phenomena: they refer to the functional structure of languages and the linguistic competence in general, which consists of *reflection*, *articulation* (as physical activity) and *synthesis* (as intellectual activity). The comparison of similar structures in (potentially) all languages should reveal their common ground in the capacity and the need of speech across all nations.

In his lecture *Über die Buchstabenschrift […]* (1824) Humboldt addressed the physiological aspects of language focussing on 'articulation' as a key term of his argumentation - in a double sense: the activity of speech organs to produce sounds and the structuring of the intellectual perception of the world, i.e. reflection. Humboldt's concept of 'double articulation' parallels his former program of comparative anthropology: the synthesis of the inner form as a result of reflection and its linguistic expression as speech. The first remains the object of philosophical conjectures the latter is an empirically accessible object.

Among others, Humboldt's concepts did not suffice to answer the question whether mental representations (or cognition in modern terms) are universal or culturally formed and symbolically encoded in signs, rituals or objects. Humboldt didn't mention the organic basis of reflection, articulation and synthesis: the human brain.

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[14] Humboldt, *Werke* 1, 350.
[15] Humboldt, *Werke* 1, 351.
[16] Humboldt, *Werk*e 1, 347 f.

The Austrian anatomist Franz Josef Gall put focus on both these questions.

3.2 Physiology and language: languages and the faculty of language

Gall seems to deliver a striking example for Kuhn's paradigmatic revolution when he fiercely rejected the sensualistic assumptions of Condillac and others. In his opus magnum *Sur les fonctions du cerveau* (1822-25) Gall excluded the possibility of circulating reference between philosophy of mind and sciences like anatomy, physiology and medicine."Ce ne sont plus les signes si vantés de nos philosophes modernes qui développent notre entendement. [...] Les signes, le langage de parole, l'écriture, le langage d'action ou les gestes, sont des créations du cerveau, et ne sont entendus qu'autant qu'ils adressent à des facultés préexistantes."[17] But at a closer look, it is quite obvious that Gall still relies on indexical signs and on language as the most important representational modality of the examination object itself.

In some way Gall turned the philosopher’s *homme sensible* upside down and focussed his research on his head, as it turns out later, a 'talking head' in a multiple sense.

A first outline of his organologic program was published in the *Neuer Teutscher Merkur* in 1798 as a letter to the Austrian writer Joseph Friedrich Freiherr von Retzer.[18] Gall's purpose was "to ascertain the functions of the brain in general, and those of its different parts in particular; to show that it is possible to ascertain different dispositions and inclinations by the elevations and depressions upon the head; and to present in a clear light the most important consequences which result therefrom to medicine, morality, education, and legislation — in a word, to the science of human nature."[19] At least in 1798 this venture was based on a set of assumptions which were completely hypothetical and based on the rather fragile evidence of indexical signs, namely the outer form of the not so fragile skull as repository of the brain. In contrast to the sensualistic doctrine with its stress on learning and to Humboldt’s ‘characters’, whose individuality was formed by ideas and sensations, Gall conceived the faculties and the predispositions or penchants as innate in man and animals,

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[17] Gall 1823, 2, 51. Cf. the extensive discussion of Condillac, Diderot and others in Gall 1823, 1, sect. 2.

[18] Des Herrn Dr. F. J. Gall Schreiben über seinen bereits geendigten Prodromus über die Verrichtungen des Gehirns der Menschen und Thiere an Herrn Jos. Fr. von Retzer. *Neuer Teutscher Merkur*, 1798, 12. Stück, 311-33.

[19] Gall 1798, 311, translated by David George Goyder, *My battle for life. The autobiography of a phrenologist*. London 1857, 143-157.

seated in the brain as separate organs and located in different parts. Therefore faculties and predispositions are neither the expression of a principle of mind purely spiritual nor acting purely by itself but connected with some particular organisation. As proof, Gall referred to the lesions of the brain, which derange the functions of the mind. This reduction of mental and emotional activities to brain functions had its complement in shrinking the human body to its head - as the origin of intellectual life and the basis for every study of man.

In Gall's opening lecture of his public *Cours de physiologie du cerveau* (Paris 1808) he demarcated his organology from physiology and physiological anthropology. "Les physiologistes, décomposant l'organisation physique, et trop circonscrits dans leur sphère, n'ont pas su toujours s'élever jusqu'aux forces réelles du monde intellectuel, et à des considérations Supérieures qui dévoient à la fois descendre à la dernière analise et remonter à la plus grande généralité."[20]

Only the cooperation and mutual help of psychological, physiological, philosophical and moral studies, which reduce causes and effects to one and the same principle, i.e. the brain functions, constitutes "une veritable science de l'homme."[21] Gall tried to embrace the 'Idéologues' to fit in their program – but in his report from 1808, Cuvier rejected his offer and others, like Flourens, called Gall's attempt to integrate physiology and psychology simply *'une suite d'erreurs*'.[22]

As I mentioned before, it should have been the linguistic competence of a classmate whose goggle-eyes indicated an overdeveloped frontal lobe, which inspired Gall to develop his organology. Pointing to linguistic competence, Gall aligned himself with the traditional focus on language as an indicator for mental activities. But instead of inferring from symbolic signs as cultural artefacts to mind he reversed this relation saying that signs are a creation of the brain and are understood by means of innate faculties.[23] After all the ample debates on the mental basis of sign language, written and spoken language and the reports on different manifestations of speech disorder, Gall attempted to integrate diverging theoretical concepts and observations in his program. He designs linguistic

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[20] Gall, Franz Joseph, *Discours d'ouverture, lu par M. le Docteur Gall, à la première séance de son cours public, sur la physiologie du cerveau, le 15 janvier 1808*, Paris 1808, 6. Cf. Cabanis in his *Rapports* (1802): "[...| la physiologie, l'analyse des idées et la morale ne sont que les trois branches d'une seule et même science, qui peut s'appeler, à juste titre, *la science de l'hom*me". Cabanis, *Rapports du physique et du moral de l'homme*, vol.1, Paris [2]1805, 7.
[21] Gall, ibid.
[22] Pierre Flourens, *Examen de la phrénologie*. Paris 1842, 30. For the relation between Gall and the medical politics in revolutionary and post-revolutionary France, see Elizabeth A. Williams, *The physical and the moral: anthropology, physiology, and philosophical medecine en France, 1750-1850*. Cambridge, NY 1994.
[23] Gall 1823, 2, 51.

competence as a unique and innate faculty of the mind with individual characteristics, consisting of mental representations and different modalities of realization like sound, sign or gesture.

The final version of Gall's model[24] of a multifunctional brain counted 27 physically discrete faculties, among them two which were associated with language: first the word-memory (*Wortgedächtnis*), in terms of modern psycholinguistics: the mental lexicon. The second faculty which Gall called *sens du langage de la parole* (*Sprach-Forschungs-Sinn*) is a strange combination of the disposition to learn foreign languages and the faculty of sound production in general, apart from the motoric aspect of articulation, which is, according to Gall, a function of the autonomic nervous system in the spinal cord.

Gall's functional and physiological dissection of the brain put old questions in a new light: "A quelle force fondamentale peut-on ramener les fonctions de cet organe? Est-ce à raison de cet organe que l'espèce humaine s'est crée un langage parlé? Cet organe a-t-il tracé aux peuples les règles immuables d'une grammaire générale?"[25]

This was on the one hand a response to the 'ideologues' and a decisive move in the debate on the localization of brain functions on the other, which took place in the following decades.

4. Variation and uniformity: the naturalisation of language or talking heads

Gall had enlarged the debate concerning uniformity and variety with a new dimension: if human faculties and 'penchants' are innate, consequently the different ways of behaviour cannot be reduced primarily to external influences like education, society and environment, but are genetically predisposed. The recent debates on the empirical status of universal grammar take root in Gall's organology as well, despite the fact that in his understanding of language as a mental ‚organ', embodiment was not a metaphor but a methodological framework for empirical studies on language as a function of the brain.

For medicine, especially neuroanatomy, language respectively the loss of language, was a central diagnostic means for damages of the brain. In the further debate (after 1830) aphasia and other forms of speech disorder played a crucial role in the quest for undisputable proofs in favour of (or against) localisation

[24] Cf. Gall, *Sur les fonctions du cerveau* (1822-1825).
[25] Gall 1823, 5, 36.

theory.[26] Moreover, Gall's organologic program had a major impact on the socio-political dimension of anthropology. If penchants are ascribed to innate capacities as inscriptions of the brain, deviant behaviour of individuals cannot emerge from the free action of will, social context or education, but from the organic equipment of the human being. As a consequence the culpability of criminals appears in a different light: could offenders be made responsible for what they have done and finally be punished? Was there any justification for social rehabilitation or houses of correction? At the end of the 18th century the *Magazin zur Erfahrungsseelenkunde* had published a controversial discussion about the criminal discretion of deaf-mutes or mentally ill people whose status of mind and intellectual capacity was questioned. Now the debate on social deviation was focussed on the very nature of man as a possible source of good and evil.

Gall wanted to shift this debate to a new level on which neuroanatomy, education and anthropology as well as social politics and criticism of society had to be viewed together. However, in my opinion, organology was inherently incapable to bridge the gap between physiological and ‘pragmatic anthropology’, which Kant described as follows: “Physiological knowledge of the human being concerns the investigation of what *nature* makes of the human being; pragmatic, the investigation of what *he* as a free-acting being makes himself, or can and should make of himself.”[27] If nature is considered as a uniform physical ground from which a limited set of modifications may develop in a regular and predictable way, then this concept is not only incompatible with Kant's 'free-acting being' but a reverse of Humboldt’s concept of uniformity and variation. For Humboldt variation was a historical and empirical fact and the universal whole a transcendental philosophical category. In the face of this clash of concepts it seems to be useful to compare the concepts of uniformity and variation in emerging disciplines like geology, biology, psychology, sociology and linguistics.

I want to conclude with some remarks concerning two terms which appear throughout my paper: *naturalization* and *'talking heads'*.

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[26] The controversy about the case of 'Tan’ is a notable example. Cf. Anne Harrington, *Medicine, mind, and the double brain. A study in nineteenth century thought*,. Princeton, N.J. 1987; Joachim Gessinger, Der Ort von Sprechen und Denken: Die Debatten um Physiologie und Sprache um 1850, in: *Transformationen der Vernunft. Aspekte der Wirkungsgeschichte der Aufklärung*. Ed. Iwan-Michelangelo d'Aprile, Joachim Gessinger and Thomas Gil, Hannover 2008, 39-79.

[27] Kant, *Anthropology from a pragmatic point of view*. Translated and edited by Robert B. Louden. Cambridge etc. 2006, 3. Flourens (1842, 31 ff.) put forward a similar argument against Gall.

5. Decapitation and fragmentation

Why *talking heads*?

In a letter to the political chronicler Konrad Engelbert Oelsner, the German anatomist and physiologist Samuel Thomas von Soemmering heavily criticized the republican innovation of the guillotine as inhuman and 'boucherie', because the brain as the seat of sensations and their apperception seems to keep on its function for a short while after the circulation of blood was stopped.[28] So, the delinquent would suffer double: from the painful cut and the *arrière-douleur* post mortem. To prove his judgement, Soemmering referred to reports (Haller, Weigard, Leveling), which noted physical reaction of heads after being beheaded. Besides the well known case of Charlotte Corday, whose cheeks blushed when slapped after the separation of the body, Soemmering referred to another observation in order to underline his view that the reactions post mortem did not result of sheer physical irritation: "D'autres m'ont assuré avoir vu grincer les dents, après que la tête étoit séparée du corps, et je suis convaincu que si l'air circuloit encore régulièrement par les organes de la voix, qui n'auroient pas été détruits, ces *têtes parleroient*."[29]

A 'talking head' without a body seems a very strange idea, but it had been conceived before as an 'experiment métaphysique' by Diderot in his *Éléments de physiologie*.[30] Looking back to the 'anatomie métaphysique' in the tradition of Locke, Condillac and others like Itard's project[31], the sensualistic embodiment of cognition turned into its dismembering, when the brain rose to prominence. The focus on the physiological basis of the 'inner sense', the brain, led to blind out the remaining body, a sort of strategic or methodical decapitation for the sake of theory. Unfortunately talking heads are not very talkative when they have been

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[28] Soemmering, Sur le supplice de la Guillotine. Letter to Oelsner from may 20th,20 May 1795, republished in *Magasin encyclopédique, ou Journal des sciences, des lettres et des arts* 1795, vol. 3, 463-477.

[29] Soemmering 1795, 3, 471, emphasized in the original text. On the aftermath of this debate, spececially the vivisectionist Legallois, cf. Cheung, Tobias, Limits of life and death: Legallios' decapitation experiments. *Journal of the History of Biology* 2013:46, 283-313.

[30] Diderot's 'idée hazardée': "Après avoir bien réfléchi, il me semble que le cerveau est l'organe, qui dans l'homme dispose de la voix, et qui par là sert de truchement à tous les autres sens. Je suppose un oeil artificiel. Je suppose un paysage de Claude Lorrain, ou de Vernet projetté sur cet oeil artificiel. Je suppose cet oeil artificiel sentant, vivant et animé; je le suppose maître de l'organe de la voix, et secondé par la mémoire, et la connaissance des sons: Je ne vois pas pourquoi cet oeil n'articulerait pas la sensation, et pourquoi par consequent il ne ferait pas entendre la description du paysage?" (Diderot, Cerveau et cervelet. Eléments de physiologie, Ms. Leningrad. *Oeuvres complètes*, ed. H. Dieckmann et. al., vol. 17, Paris 1984).

[31] See Sabine Arnaud's paper *"Un enfant presque ordinaire": Sujet médical, pédagogique, ou politique? Rencontre de compétences et définitions des rôles dans les années 1800*.

cut off the body, which posed a methodological problem for physiological anthropology as a sign-mediated practice: they couldn't any longer deliver clues about perception, dispositions, ideas or imagination, language as representational technology was lost and hence leaving any interpretation void. The inner sense had lost its ability to express itself or *the* self via ordinary language, when the vital force had stopped. So Gall, his followers and his critics connected brain damages with observable effects on behaviour, and especially on language. But connections were conjectural as long as the patient was alive and could be verified only post mortem – if ever.

The conceptual and practical decapitation (or partial disembodiment) gives our understanding of 'naturalization' a special twist. As Michael Hagner pointed out, we have to make clear 'which sort of naturalization' we are talking about.[32] Anatomy and physiology rely on analysis ('*Zergliederung*') and at the turn of the century, when physiology was adopted as a or *the* '*Leitwissenschaft*', the philosopher's 'mind' became fragmented, when it was transformed into physical nature. Gall counted 27 different mental organs, Broca and Wernicke related traumata of the third frontal convulsion of the left frontal lobe resp. the left temporal lobe with different characteristics of speech disorders. Humboldt's concept of the individual as a 'modified whole' embedded in its historical cultural context, offered, as I said before, no sustainable bridge between transcendental and physiological anthropology, or from humankind to the autopsy table, but paved the way in other directions, to folk and social psychology.

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[32] Hagner 2000, 20.

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