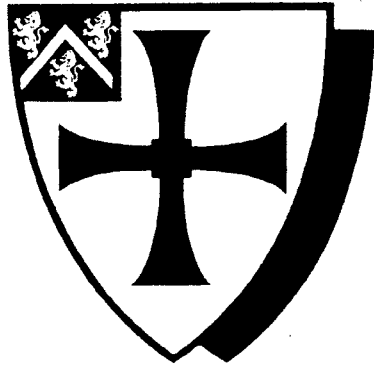


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TELESIO'S PSYCHOLOGY AND
THE NORTHUMBERLAND
CIRCLE

BY

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Starting from the 1960s studies on early modern natural philosophy in England have emphasized the role of the Northumberland circle in transmitting and elaborating ideas resumed from the naturalist strand of Italian Renaissance philosophy. It is indeed well-known that Henry Percy surrounded himself with mathematicians, astronomers, natural philosophers, and physicians, who shared anti-Aristotelianism as well as a materialistic view of the world, inspired at least partially by 16th-century Italian philosophy. Kargon and Jacquot argued that the cosmology and the natural philosophy of Renaissance authors, such as Giordano Bruno, surely found supporters at an early date in Elizabethan England. Moreover, they hypothesized that through the Northumberland circle Italian Renaissance philosophy also influenced the Cavendish circle, eventually inspiring even Thomas Hobbes's natural philosophy and psychology¹. Crucial stages in this development are considered Nicholas Hill's *Philosophia Epicurea*, Thomas Harriot's speculations on the structure of matter, and Walter Warner's formulation of the first principles of natural philosophy and his inquiry into the workings of living organisms. Recently, Karl Schuhmann and Jan Prins have paid attention to the influence of Bernardino Telesio (1509—1588) in England². Schuhmann argued that Telesio and Hobbes shared a common philosophical milieu, and approached philosophy in a comparable way. Prins' investigation of Walter Warner's notes on animal organisms suggested that Telesio's psychological theories probably exerted a stronger influence in early 17th-century England, than until now, on the authority of Francis Bacon, has been assumed³. At the turn of the 16th and 17th centuries there was a remarkable interest in psychological issues. From a recent paper by Gordon Batho, we can make out that the ninth Earl of Northumberland urged above all the study of the doctrine "de

Anima"⁴. A *Treatise of the Soule* is attributed to Sir Walter Raleigh⁵. Finally, as has been shown by Prins, Walter Warner was involved for many years in psychological research⁶.

This paper discusses the possible relation between Telesio and early modern psychology in England, focussing on Telesio's use of the concept of motion in the explanation of cognition and in his view of conceptualization. The first section briefly sketches the presence of Telesio in 16th- and 17th-century England. Section 2 describes his theories of perception and intellectual knowledge. Section 3 is devoted to his analysis of cognition in terms of motion, while in section 4 his view of conceptualization is analyzed. In section 5 Telesio's ideas are summarised on these issues and compared with views developed by Walter Warner and Thomas Hobbes. A short conclusion follows.

1. TELESIO IN ENGLAND

Early modern English naturalist philosophers were undoubtedly influenced by the anti-Aristotelian philosophies of Bruno, Patrizi, and Telesio. By the end of the 16th century, these authors became gradually known in England. From 1583 to 1585 Giordano Bruno stayed in London and published his Italian dialogues there. His writings were present in the libraries of various representatives of the gentry⁷. Also Francesco Patrizi's works were not unknown⁸. Telesio's presence in England is more difficult to trace. To be sure, he was well known on the continent. Descartes and Gassendi mentioned him and regarded his work as innovative⁹. Subsequently, Mersenne and Naudé sharply criticized his views¹⁰. His name is mentioned also by other French authors¹¹. And in Germany, the eclectic Aristotelian Otto Casmann

presented large quotes from his works¹². Also in England, Telesio's works must have been more widely known than had been assumed till recently¹³. His writings do not appear in the library of Henry Percy¹⁴. However, the libraries of John Rainolds, president of Corpus Christi College from 1598 till 1607, and of Walter Raleigh contained work by Telesio¹⁵. Also Harriot's legacy contains a note on Telesio¹⁶. Apparently, Walter Warner's theory of spirit was influenced by Telesio, and he mentioned him at least once, in a context which for present purposes is crucial¹⁷. Also Nicholas Hill's psychology was possibly influenced by Telesio¹⁸. Francis Bacon praised Telesio as the first of the moderns¹⁹ and appreciated his theory of spirits²⁰. Yet Bacon held that in the early 1620s Telesio's philosophy was already forgotten in England²¹, and in his philosophical analyses of the myths of Cupido and Uranos (*ca.* 1623-24), he attacked Telesio's doctrine of natural principles²². John Webster repeated Bacon's praise of Telesio²³. Hobbes mentioned Telesio in a long list of works²⁴, and he probably was acquainted with his work²⁵. Finally, through the intermediation of Gassendi, Telesio's concept of time might have influenced Newton²⁶.

2. PERCEPTION AND INTELLECTION

Telesio attributed traditional psychological functions to a material spirit embodied in the nervous system²⁷. All mental activity ultimately depends on external stimuli, which affect the spirit and bring about sensation. Once modified, the spirit stores the affections that caused sensation in the form of physiological traces, which are the basis for memory and thought. The spirit is a relatively closed system which on the impinging of 'rough' stimuli develops emotion, perception and thought. The spirit is distinguished from the immaterial,

rational soul, which is a divine creature added to the spirit as its form²⁸. This divine soul is unable to operate without the sensible soul, however, and its contribution to knowledge of natural reality, though valuable, is essentially inferior to that of sense perception²⁹. All activities of the spirit are governed by self-preservation: the spirit must for its own benefit be aware of pleasing or displeasing things in its environment³⁰. Sensation occurs when the spirit is affected (in alternate dilation and contraction) by external things. Pushed to its own operation (motion) in the sensation of things affined, the spirit enjoys well-being³¹.

The spirit, although present in the whole body, has its principal seat in the brain³². The 'central portion' of the spirit coordinates those parts of the spirit located in the peripheral areas of the body, which communicate directly with the surrounding world. The existence of a central portion of spirit forms the basis for the perception of differences and for the existence of memory and intellection³³. Telesio's arguments for the existence of coordinating capacities of the spirit's central part have a strictly empirical character. Animal organisms are moved by a desire of self-preservation. And from this central notion all cognitive capacities are inferred³⁴. Also the fact that the spirit feels differences and similitudes is argued for only on empirical bases.

Although he held that there is one soul in each animal and human being that accounts for perception, motion and thought³⁵, Telesio drew a physiologically grounded distinction between various psychological competences. Notice, however, that Telesio did not introduce different kinds of psychological *mechanisms*. He rejected any principled distinction between perception and cognition. The spirit present in the peripheral

regions depends on the commands of the central part and participates in its capacities³⁶. The peripheral spirit captures the external stimuli. The central part, reposing well protected inside the brain, is not moved by external affections; unlike the peripheral spirit, it is neither vexed by its *own* passions nor occupied by its *own* operations³⁷. It is therefore able to grasp the operations and passions of the peripheral parts, elaborating, organizing and preserving the information received from the peripheral regions.

Sensation consists in the reaction of the spirit to its alterations. Since the spirit is hot and mobile matter, this reaction is a motion³⁸. The spirit's reaction to external stimuli is like a primitive awareness of its affections. The central part of the spirit stores the motions that caused its alterations. Rather than proper perceptions or images—as Aristotle erroneously held³⁹—various types of physiological traces (including warmth and coldness) are stored⁴⁰. This coded information, incorporated in the physiological structure of the spirit, forms the basis for all other types of cognition. All the other, derivative cognitive functions, including imagination, memory and discursive reasoning or intellectual thought, derive from a “*motus recolens*”⁴¹. They depend on sensation, to which they are essentially inferior⁴². Intellection, for example, consists of the recollection of past motions or passions in and by the spirit (“*recolitio passionum motuumque*”)⁴³. Telesio therefore assimilated it to imagination and described it as “*commemoratio*” or “*existimatio*”⁴⁴.

Intellectual thought is needed to inform the spirit about things that are distant, absent or partly unknown. When something is perceived incompletely, cognition may be completed by comparison with previous perceptions⁴⁵. In man it is the divine

soul that is called upon to perform these operations, but the divine soul itself depends on the spirit's capacity to recall past motions⁴⁶. In primary perception the spirit is able to detect similitudes and diversity in the affections it undergoes⁴⁷. The similitudes, detected by the spirit, are the basis of all rational thought⁴⁸. Thus, cognitive structure emerges from patterns of recurrent sensorimotor activity, duly recognized by the spirit.

3. MOTION AND COGNITION

The spirit is a hot mobile substance: motion is its own operation⁴⁹. The spirit is attributed the possibility of communicating motions to itself⁵⁰. The central part furnishes the "modus & ratio" of moving to its peripheral parts and, thus, the latter move "iuxta universitatis decreta"⁵¹.

Intellection, which is essentially inference on the basis of stored information ("recolitio"⁵²), is grounded in a specific motion of the spirit, defined by Telesio as "motus recolens". In virtue of, or through this motion, presupposing that in the spirit remains a "cognitio motuum"⁵³, the spirit is able to recall past affections⁵⁴, to pay attention to them⁵⁵ and to compare them⁵⁶. An attempt is made in this section to elucidate from an historical perspective the Telesian notion of "motus recolens", a crucial concept in the explanation of more properly cognitive activities.

Telesio's appeal to motion in explaining perception and cognition chiefly recalls the kinetic aspects of Hellenistic psychology. Epicurus characterized perception as a change in the atomic motions of the soul. Also the mind itself acts as a kind of sense organ responsive to flimsy atomic structures. Thus, Epicurus assimilated thought to sense perception, at least insofar as its objects *and* causes are concerned⁵⁷. Indeed,

Sextus described Epicurus' view of (conceptual) notion as a "bare movement of the mind"⁵⁸. According to the Stoics, perception arises from tensions of various sorts in the *pneuma*-continuum, with which the human soul—the most rarified of all bodies—interacts⁵⁹. In sensitive perception, a current of *pneuma* flows from the leading part of the soul (*hegemonikon*⁶⁰) to the sense organ, and then leaves the body; after undergoing a modification, it eventually returns to the body and deposits a sensory image, or *phantasia*, in the mind. Accordingly, the Stoics acknowledged two sources of movement in perception, namely, the percipient soul and the perceived object⁶¹.

The role of motion in explaining psychological phenomena was controversial in the Peripatetic tradition. Aristotle regarded psychology as a chapter of natural philosophy, and applied the scheme of the active and passive *dunamis* also to psychic functions. Thus, as active *dunamis*, the soul is a source of motion⁶². And the active mind is defined in terms (*apathes* and always active) which strongly remind the First Mover of the *Metaphysics*⁶³. However, Aristotle criticized the position of his predecessors who attributed motion to the soul itself in order to explain its causing motion⁶⁴. He denies that the soul can move in virtue of itself, because (1) it does not have a distinctive location of its own, (2) it does not have a natural motion, and (3) it cannot leave the body⁶⁵. For the issue under scrutiny, another point should be mentioned. Aristotle stated that the possible intellect undergoes (*paschein*) its objects⁶⁶. And in later Aristotelian psychology, this "passion" was generally interpreted in the sense that forms without matter or else intelligible species move the possible intellect⁶⁷. There is only one intellect whose operation can be described as motion: the first mover⁶⁸. Subsequently, the view that the status of the

(unique) intellect is similar to that of the celestial motors was endorsed by the Arab philosopher Avempace, and referred to, among others, by the medieval master of arts Siger of Brabant⁶⁹.

The concept of motion recurred in various contexts in medieval psychological debates. Godfrey of Fontaines (*ca.* 1250—1306/1309), John Duns Scotus (*ca.* 1265—1308), and Hervaeus Natalis (*ca.* 1250/60—1323) viewed intellection as a “*motus rei ad animam*”⁷⁰. Conversely, Peter Crockaert (*ca.* 1465/70—1514) considered intellectual abstraction as “*realis motio qua movetur intellectus a fantasmate, vel ad speciem intelligibilem vel ad actum intelligendi*”, in order to secure effective and distinct roles for phantasms and agent intellect in the production of mental acts⁷¹. By contrast, other authors insisted on excluding any ‘real moving’ from the cognitive order. The fourteenth-century Matthew of Gubbio, for example, denied that the species or phantasms can determine our intellect “impressive”, or even “cognitive”, for they move our intellect “delative”, that is to say, the intelligible species reveals the associated thing “*sicut effectus defert causam*”⁷². And his contemporary Thomas of Strasbourg argued that no “*motus localis*” is to be ascribed to the agent intellect⁷³.

During the Renaissance, Cusanus defined intellection as “*motus mentis*”⁷⁴. It is clear, however, that only metaphorical motion was meant. Also other Renaissance authors stressed the metaphorical value of motion applied to the intellect and its acts. Antonio Montecatini, for example, argued that intellection is like a “*motus spiritualis*”, and that the illumination of the phantasms is not to be compared with a “*motus physicus*”⁷⁵. Simone Porzio rejected the idea that the

agent intellect is a “real”, that is, a physical motor. In his analysis of the relation between the agent intellect and the phantasm, Porzio emphatically stated that terms like “motor, motum, & materia” apply to the cognitive process only “metaphorice”. Indeed, in contrast to what the Latins thought, the agent intellect is not an “agens reale” like heat, for example, but rather an “agens illuminans”. The agent intellect moves the phantasm “per similitudinem”⁷⁶.

Telesio’s use of the concept of motion in explaining mental acts is not metaphorical. The spirit is a material substance and therefore its motions are to be regarded as physical events. However, the notion of “motus recolens” has an undoubtedly mentalistic flavour, suggesting more questions than it seems able to resolve. How does the spirit recall stored motions through motion? Surely, motion *grounds* the act of recalling. Sensation, cognition and memory are also seen as motion *in se*, however. In this sense, a problematic point remains. Telesio did not present a detailed analysis of the aforementioned motion in biological or physiological terms. It is true that Telesio developed a physiological account of the ways in which the spirit feels, imagines and understands, but this theory merely regards the physiological prerequisites of an optimal psychological functioning⁷⁷. Thus, a large gap remains in the understanding of the biological bases of psychological phenomena.

4. MENTAL ACTS AND REPRESENTATIONS

Telesio devised a psychology of cognition which dispenses with representations as bearers of content. Indeed, in his system the analogue of historical notions indicating perceptual or mental representations—such as the Aristotelian

phantasma, the Epicurean *prolepsis*, the Stoic *phantasia*, or the Scholastic *species*—is lacking. To be sure, the spirit *does* produce *actual* internal representations in response to external stimuli (received as passions) and to internal stimuli (preserved affections and motions of the spirit). However, it does not *manipulate* images or in any way traffic in pictures⁷⁸. Mental representations, in sum, exist as actual construals, or more precisely as reconstructions of the world, but not as stored information-bearing structures. A short retrospective may underscore the exceptionality of Telesio's position.

Aristotle regarded the mind as capable of grasping forms detached from matter. Most of his medieval and Renaissance followers interpreted this conception along the lines of a theory of abstraction, grounded in the mediating role of representational forms called sensible and intelligible species. In Peripatetic psychology, sense perception occurs when sense organs are affected by external stimuli (sensible species); it consists essentially in the production of sensory representations called "phantasmata". The latter are the product of a dynamic complex of inner forces (the so-called inner senses: common sense, imagination or phantasy, "aestimativa" and/or "cogitativa"⁷⁹), capable of organizing and transforming the information received from sense organs and external senses. On the basis of phantasms the agent intellect generates intelligible species, which establish the link between sensory operations and intellectual activity, thus ensuring the objective reference of cognitive contents.

The Scholastic doctrine of species is not a straightforward elaboration of doctrinal elements typical of a specific philosophical school. Its proximate source is the Arabic speculation on intention, in which two conceptions converge:

the Aristotelian matterless form and the Hellenistic cognitive impression. In Epicurus, the *prolepsis*, characterized as the effect of an involuntary and unconscious mental mechanism, was viewed as the basis for conceptualization. The theory of preconception was needed to fill out Epicurus' broad account of perception, for the perceiver is not only appeared to but also classifies what is perceived. The Stoics focussed on the criterial role of unerring cognitive impressions (*phantasiai kataleptikai*), assigning them the function of providing reliable data for discursive reasoning. When the soul is affected by a cognitive impression, it becomes capable of perceiving determinate objects and forming true judgments. The Arabic intention echoes these Hellenistic conceptions. It is both a representational item and the result of the soul's operations on the effects of sensation. Deeply influenced by Neoplatonic metaphysics, Arab philosophers did not accept Epicurean or Stoic materialism, and develop a theory of conceptual abstraction which introduces a clear-cut hierarchy of sense perception and intellectual knowledge.

The theory of conceptual abstraction was highly controversial among Peripatetic authors. Two positions developed during the controversies may throw light on Telesio's view of conceptualization. First, a considerable number of the medieval and Renaissance Peripatetics challenged the mediating function of the intelligible species as representation, and regarded it as a mental act grasping content⁸⁰. The driving force behind their position was the idea that knowledge cannot depend on any prior actualization of the mind by the species, as this would entail the contradictory claim that the mind knows before it effectively grasps its objects. According to Zabarella (1533—1589), a younger contemporary of Telesio, the species may be identified with the intellective act, insofar

as this act depends on the phantasm's causing a primary specification of the mind. This brings us to the other issue, which regarded the final outcome of abstraction, namely, whether this is an individual form or species, or else a universal. Some medieval and Renaissance authors distinguished between two moments in the generation of intellectual knowledge. In 'first order' intellection, a concrete notion of a singular essence is generated; then the intellect is able to engender universals⁸¹. Thus, abstraction is no longer attributed to the (unknowing) agent intellect, but seen as a successive elaboration of sensory information by the possible intellect. The next step is to substitute generalisation for abstraction. Indeed, according to Suarez, the universal does not arise from 'abstraction', but rather from a process of "comparatio"⁸². The intelligible kernel of substantial reality is known by discursive reasoning on the basis of the information made available by the agent intellect⁸³.

In Telesio's view, conceptual structures arise from two sources: the structured nature of bodily experience (the perceived "similitudines"), and a wired-in capacity to elaborate certain well-structured aspects of bodily and interactional experiences into abstract concepts. Intellection is determined by the functional interaction of this wired-in capacity and the stored motions. From this interaction emerge mental acts, through which man models or rather reconstructs the environment based upon experience. The spirit's operations do not rely on internal representations, nor are sensory and intellectual experiences stored as images or concepts.

Telesio shares the insight with the Aristotelian tradition that direct realism in the sense that the world affords a direct

transfer of information that suffices for perception and action, is untenable. How does Telesio explain the ability to categorize objects and events on the basis of sensory signals received from the environment? Like some medieval and Renaissance Aristotelians, he rejected the distinction between mental act and representation, and held that conceptualisation depends on preceding, primary mental acts. However, his view cannot be re-phrased in the Aristotelian framework. Cognition and conceptualisation consist in a process of self-modification by the brain. The spirit neither receives nor abstracts forms, but re-constructs past experiences or integrates them on the basis of past motions or traces stored in its own structure. The latter are not some sort of interface between the spirit's conceptual powers and the external world. Telesio tried to show that the facts of human knowledge, memory and recalling argue against the view that what is involved in such cognitive activities is some iconic and uninterpreted sensory pattern, as is implied when we speak of forms or images. Mental content is not located in particular symbols or representations, but is a sort of function of a state of the spirit. Conceptions are acts, not referents of thought. Thus, representing is based on a skill or an ability for organizing perceptual data, not on (iconic) representations. Cognition and memory depend on the capacity to arrive at states similar to some previous states, rather than on pulling something out of the herd, that has been stored there.

5. TELESIO AND EARLY MODERN ENGLISH PSYCHOLOGY

The Telesian spirit is an aggregate of interacting parts, which follow biological rules of operation, induced by self-preservation. The spirit can be perturbed and can undergo internal, structural changes. In reaction to these

changes the living organism *generates* perceptual information. Perception and cognition are mental responses attuned to useful affordances, to be found in the environment. Perception involves the gathering of information about the environment on the basis of physical stimuli impinging on the sensory structure. The peripheral spirit transforms the physical energy of the affections into a coded, information-bearing, structure, which comprises data for the (mental) processes of the central portion of the spirit in the brain. Evidently, survival requires the ability to categorize objects and events on the basis of sensory signals received from the environment. Thus, the subsequent higher-level elaboration is progressively selective in its response to features of the sensory stimuli. Sensory experiences are not passive affections, but acts of a living being, operating according to sensations of pleasure and pain. The spirit's principal activity is that of making changes in itself. The organism may also operate independently from external stimuli: cognition is produced by the spirit's interaction with itself. It consists essentially in a reconstruction of a state of affairs which is not immediately present. According to Telesio, perception and cognition do not consist in the detection or assimilation of formal features of the environment. Rather, they are the result of the spirit's active response to alterations caused in its physiological structure by external stimuli. Mental acts are integrated in a selforganized process of adaptive interaction with the environment. Mediated representations are not required for this kind of system to behave adaptively.

Telesio did not have, strictly speaking, English followers. Yet, the psychological ideas developed by authors such as Walter Warner and Thomas Hobbes show a remarkable affinity with some of his views. With the Cosentine philosopher they share:

(1) a generic aversion to Scholastic philosophy; (2) a materialistic psychology; (3) the idea of man as an organism, striving for self-preservation, and not fundamentally different from animals; (4) the primacy of sensation over cognition, regarding the latter as the result of motions starting from what the senses furnish; (5) a rejection or else relativization of traditional faculty psychology⁸⁴. There are also important differences, however. Unlike Warner and Hobbes, Telesio thought that some psychological functions and acts of man—most noticeably his aspiration to divine and immortal things that belong to his eternal preservation—cannot be explained without postulating an immaterial mind⁸⁵. Telesio and Warner had a keen interest in biology and medicine, problems which Hobbes deliberately left to the competence of professional scientists. Therefore, the theory of spirit—crucial notion in Telesio and Warner—was of no particular interest for Hobbes⁸⁶. According to Hobbes, instead, knowledge and science are based on the human capacity for retrieving sensory information (images) by means of language. The language faculty is found in man alone. Thus, logic, which treats the definition and computation of words, has a central role in philosophy⁸⁷.

In the next section a comparison is drawn between Telesio, Warner and Hobbes, but first the psychological insights of Warner and Hobbes are briefly summarized.

5.1. *Warner and Hobbes*

Walter Warner's notes on psychological functions, probably written between *ca.* 1590-1610, show a combination of novel and traditional views⁸⁸. In his view, all animal organisms are ruled by a homogeneous, warm, active spirit⁸⁹. Warner

regarded the soul as a centralized system of animal spirits. The soul is a material entity that in its operations is impelled to self-conservation. These operations can be reduced to motion⁹⁰. Thus, mental acts are related to corresponding bodily processes.

Warner is less polemical than Telesio towards Aristotelian philosophy and continues to use its explanatory principles, such as the distinctions between matter and form, act and potency⁹¹. Moreover, he had a quite traditional view of the processes underlying perception and cognition. In his view, sense perception is the result of the impression of a species on an organ of sense. This impression is due to a local motion, because sensation is alteration and no alteration can be without local motion⁹². From the sense organs the species are transferred to the common sense or phantasy, where sensation occurs. Common sense or phantasy is the faculty which receives, stores and recalls the impressions of the senses⁹³. These impressions are called phantasms with respect to their reception and retention in phantasy. However, Warner did not distinguish between impressions, species, or ideas⁹⁴. As in Peripatetic psychology, Warner attributed to the intellect the task of "speculari phantasmata et recipere species intelligibiles". And its speculation consists in a comparative analysis of the phantasms⁹⁵.

Hobbes explained the genesis of perceptual and mental representations exclusively in terms of matter and motion. Perception and the production of primary knowledge (images, ideas etc.) are phenomena that belong entirely to the physical realm. This is why he discussed them not only in *De homine*, but more generally also in *De corpore*⁹⁶. The object causes a motion in sense organs that elicits a reaction in the brain,

BERNARDINI
TELESII
CONSENTINI

DE RERVM NATVRA
IVXTA PROPRIA PRINCIPIA.

LIBRI IX.

AD ILLUSTRISSIMUM, ET ECCELLENTISS.
DON FERDINANDVM Carsaram Nuceria Ducem.

SVPERIORVM PERMISSV.



NEAPOLI

Apud Horatium Saluarum. M. D. LXXXVI.
CVM PRIVILEGIO REGIO.

Frontespizio dell'ultima edizione del *De rerum natura*.

Fig. 1. Frontispiece from *De rerum natura*, published in Filosofia e scienza in Calabria nei secoli XVI e XVII, L. De Franco, Cosenza



Fig.2. Portrait of Telesio,
reproduced in *Introduzione a Telesio*,
R. Bondi, Bari-Roma 1997.

namely a representation⁹⁷. The phantasm or mental picture is an effect in the nervous system, which reacts to the motions by external objects⁹⁸. According to Hobbes, perception is motion. Sensations are produced through a physical and physiological process. When the brain is stirred by physiological motions it generates an effect that is propagated 'outwards', that is, a perception consisting in images or phantasms. Thoughts about general features are based on a comparison between phantasms⁹⁹. Concepts or ideas (which are not fundamentally different from images or phantasms¹⁰⁰) are translations of the motions occurring in the perceptual apparatus¹⁰¹. Indeed, Hobbes made no essential distinction between imagery and (primary) cognition. His theory of perception did not envisage any hierarchical ordering between sensory processes and intellectual processes¹⁰².

Hobbes believed that phantasms and ideas are physical responses of the brain to stimulation by external objects. Thus, phantasms and ideas depend on the perceptual apparatus as much as they depend on the external agents of change. They may be said to represent the world beyond the senses inasmuch as they are mechanically produced by that world. Hence, they may be used by man (the rational animal) as a relatively reliable basis for scientific inference about the world. However, since phantasms and ideas are the joint product of a causal interaction between at least two physical agents, it is impossible that they represent the formal *nature* of material things, with the sole exception of magnitude and motion (the two "accidentia communia" of all bodies)¹⁰³.

5.2. Motion and materialism

The psychological research by Telesio, Warner and Hobbes was deeply inspired by the scientific innovations of their time. However, there are some significant differences with respect to the specific context of their speculation. Telesio's psychology was influenced by the 16th-century findings of anatomy and physiology. Warner's notes on animal organisms depended mainly on similar sources. However, he was principally a mathematician and scientist. And his psychological research must be understood also in the context of early experimental science. Moreover, in remarkable contrast with Telesio and Hobbes, Warner did not reject Aristotelian psychology *tout court*. Hobbes regarded himself mainly as philosopher and developed a philosophical psychology on strictly mechanistic grounds. The use of the concept of motion by Telesio, Warner and Hobbes in the explanation of mental functions and acts reveals the development in the psychological research by late Renaissance and early modern naturalists. Telesio regarded the spirit as a hot, mobile substance. According to him, motion pertained to the very *nature* of the spirit. Therefore, he explained psychological acts in terms of motion. Similarly, Warner defined the soul as a complex of spirits, whose operations can be reduced to motion. In Hobbes, motion has become a strictly *relational* term, it is no longer seen as pertaining to the nature of the spirit of the soul. The human soul is material and therefore subject to motion. Thus, like every natural science, psychology explains its object in terms of matter and motion.

Telesio's central methodological stance, aiming at explaining natural phenomena "*iuxta propria principia*", leads in matters psychological to a strange mixture of physicalist and

mentalist terminology. And the view of a "motus recolens" offers a most remarkable specimen of this mixture. Telesio described the complex interaction between the central spirit and the peripheral parts in strictly *psychological* terms. For example, in all its activities the central part is prompted by the *desire* of self-preservation¹⁰⁴. Thus, the specific laws that govern complex mental acts, such as memory and intellection, remain mysterious. Telesio seems to suggest that the organism contains criteria to develop information upon sensory stimuli. This entails that the ability of the spirit to categorize an unlabelled world in an adaptive fashion is seen as a primitive capacity.

Also Warner and Hobbes developed a naturalistic account of psychological phenomena. With Telesio, Warner shares a form of materialism without reduction. He thought that the language of biology and physics may explain mental phenomena. Yet, the latter are not denied as such. Also his views of the spirit and its functions are characterized by a mixture of materialistic and mentalistic explanations. The animal spirits are material, but the spirit is endowed with mental powers. Hobbes put forth a more straightforward form of physicalism. He explained psychological phenomena in terms of matter and motion. Yet, he did not regard the traditional psychological terminology as meaningless or void of reference, nor did he challenge the existence of psychological functions and mental phenomena.

5.3. *Representation and object*

In several early modern English works on psychology and epistemology the doctrine of species is accepted. Richard Burton¹⁰⁵, Nicholas Hill¹⁰⁶, Francis Bacon¹⁰⁷, and Herbert of Cherbury¹⁰⁸ are cases in point. Also Warner and Hobbes

should be mentioned. Warner endorsed the traditional doctrine of sensible and intelligible species¹⁰⁹. Hobbes drew up a doctrine of (sensible) species in his early *Short Tract* (ca. 1634)¹¹⁰, which shows some affinity with medieval perspectivist optics¹¹¹. In *Anti-White* (ca. 1643), Hobbes still used the term “species”, which was now identified with the mental image or picture derived from the action of an agent outside the mind¹¹². Adopting the term “species” from Thomas White, Hobbes defined it here as “*apparentia et aspectus materiae*”, equating “species, sive imaginem, sive ideam in sentiente”¹¹³. In later works, however, he definitely broke away from the Scholastic psychology of cognition, and relentlessly emphasized the absurdity of the theory of species.

Telesio dispensed with any form of representationalism. The term “species” is used only in its original sense, namely as aspect of a thing¹¹⁴. Most remarkably, also terms, such as phantasm, idea, and thought, are absent in his works. As we have seen in the preceding section, Telesio did not presuppose any type of mental representation to be retained or stored in the spirit. This seems a crucial difference between Telesio’s psychology of cognition, on the one hand, and those of Warner and Hobbes, on the other hand. The latter two held that the action of external bodies on the senses results in phantasms, or else species, images, ideas, concepts (they are not too strict in terminology)¹¹⁵. However, the traditional terminology used by Warner and Hobbes suggests differences which at a closer examination appear to be quite inessential. Warner regarded phantasms as configurations pressed into the spirits, and Hobbes regarded them as motions.

What do we know, or, more precisely, which is the object of cognition? If what we receive or store are motions or

configurations in the spirit, what do we know effectively? Telesio accepted that perceiving a physical object is a causal relation. Percepts may owe some of their properties in part to the conditions of perception, such as the disposition of the body and that of the spirit at a given moment¹¹⁶. Yet, what we experience are items of our physical environment, and not surrogates or images or intermediaries. Thus, the spirit is able to detect the *nature* of things¹¹⁷. Warner, more cautiously, thought that the external senses do not perceive the things themselves, but their qualities, while the internal senses perceive only motions of spirit. Subsequently, the intellect's objects are the relations between phantasms¹¹⁸. Hobbes' philosophy constituted a profound rupture with Peripatetic thought. He accepted mental representations, but he denied that their contents correspond to objective properties of the external world. Images and ideas are the products of motion, and have no formal affinity with their causes. Perception is apparition unto us of that motion, that the object works in the brain or spirits¹¹⁹. "All sense is fancy", as Hobbes famously put it, with the exception only of extension and motion.

6. MOTUS RECOLENS: A CONCLUDING REMARK

The affinity between Telesio's naturalistic philosophy of mind and the psychological research by early modern English scientists and philosophers, such as Warner and Hobbes, may not be an indication of a direct influence of the Cosentine philosopher. Rather, with Telesio they shared a common philosophical and scientific milieu, characterised by anti-scholasticism and materialism. The three authors examined here regarded human soul as an integral part of natural reality and developed psychology in the context of contemporary science. Therefore, the main differences between their

positions as well as the possible line of development one may trace between them reflect the development of science between the second half of the 16th and the first half of the 17th century. Telesio's psychology was indebted to the 16th century discoveries in anatomy and physiology. Warner was active at the dawn of the scientific revolution and his psychological research must be interpreted in the context of his broader scientific interests. His psychology is essentially eclectic, however. Hobbes formulated a new philosophical psychology in mechanist terms as a response to recent developments in modern physical science. They all departed from traditional psychology, even though the rupture with past conceptions was not complete. For example, Telesio held the possibility of knowing the essences of the external reality, while Warner and the early Hobbes stuck to a theory of mental representation which was largely phrased in traditional terms.

The psychological theories of Telesio, Warner and Hobbes are grounded on a central conviction: mental phenomena supervene on physiological processes which are essentially analysable in terms of motion. Without eliminating classical psychological terminology, they attempted to analyse psychological phenomena in terms of motion. Telesio broke away from a merely metaphorical use of motion, as present in medieval and Renaissance psychological works, and resumed the kinetic aspects of Hellenistic psychology. He regarded motion as the spirit's proper activity and grounded both perception and cognition on specific types of motion. The specific characteristics of 'psychological' motion ("motus recolens") remain unexplained and obscure, however. Also Warner described the activities of the spirits as motions. His psychology is essentially eclectic, however, and his theory of mental representation is only the Scholastic theory translated

into mechanical terms. According to Hobbes perceptions are motions, and ideas or concepts are elaborations of the motions occurring in the perceptual apparatus. Here a remarkable development in psychological theorizing can be detected. While Telesio and Warner, more or less explicitly, regarded motion as a property pertaining to the nature of the spirit(s), Hobbes adopted a relational concept of motion. Thus human soul does not move in virtue of its nature. Rather, as a natural entity, it is analysed as matter in motion.

NOTES

- ¹ R. H. Kargon, *Atomism in England from Harriot to Newton*, Oxford 1966, pp. 5-42; J. Jacquot, "Harriot, Hill, Warner and the new philosophy", in *Thomas Harriot: Renaissance Scientist*, ed. J.W. Shirley, Oxford 1974, 107-127.
- ² See K. Schuhmann, "Hobbes and Telesio", in *Hobbes Studies* 1(1988), 109-133; J. Prins, "De invloed van Telesio in Engeland", in *Filosofiedag Utrecht 1989*, ed. G. Vandenakker, Delft 1989, 154-160. For biographical information, see F. Fiorentino, *Bernardino Telesio, ossia Studi storici sull'idea della natura nel Risorgimento Italiano*, vol. I, Firenze 1872. Of the *De rerum natura iuxta propria principia* I have used the edition by L. De Franco, vol. I (books I-III) and vol. II (books IV-VI), Cosenza 1965-1974, and vol. III (books VII-IX), Firenze 1976.
- ³ J. Prins, *Walter Warner (ca. 1557-1643) and His Notes on Animal Organisms*, PhD dissertation, Utrecht 1992.
- ⁴ See G. R. Batho, "Writings in the Tower of London 1603-1618: The advices of Sir Walter Raleigh and the ninth Earl of Northumberland and their philosophical bases", paper read at the congress on *Riforma e renovatio nel Cinquecento europeo* (Rome, 23-25 October 1995) printed in *Nouvelles de la République des lettres* 1996- II, Prismi, Napoli, pp. 25-46; cf. also Kargon, *Atomism in England from Harriot to Newton*, p. 13.
- ⁵ Also in *The History of the World*, Raleigh develops psychological theories. However, the attribution of this work is questionable; see P. Lefranc, *Sir Walter Raleigh écrivain*, Paris 1968, p. 57.
- ⁶ Newly discovered papers confirm Warner's interest in matters psychological; cf. Stephen Clucas' report during the Tenth Durham Thomas Harriot Seminar (16-18 December 1996). See *The Harrioteer* February 1997 (IHIS, School of Education, University of Durham).
- ⁷ See H. Gatti, "Giordano Bruno: The texts in the library of the ninth Earl of Northumberland", in *Journal of the Warburg and Courtauld Institutes* 46(1983), 63-77; idem, "Minimum and maximum, finite and infinite. Bruno and the Northumberland circle", in *Journal of the Warburg and Courtauld Institutes* 48(1985), 144-163; R. Sturlese,

Bibliografia, censimento e storia delle antiche stampe di Giordano Bruno, Firenze 1987; S. Ricci, *La fortuna del pensiero di Giordano Bruno 1600-1750*, Firenze 1990, cap. II.1.

⁸ J. Prins, *Walter Warner*, 47-50.

⁹ See Descartes, *Oeuvres*, ed. Ch. Adam & P. Tannery, Paris 1982-87, vol. I, 158, Gassendi, *Opera omnia*, Lyon 1658, vol. I, p. 245B.

¹⁰ S. Ricci, *La fortuna del pensiero di Giordano Bruno*, quotes on pp. 86, 90-91: Mersenne, *Quaestiones in Genesis*, Paris 1623, "Praefatio ad lectorem"; Gabriel Naudé, *Advis pour dresser une Bibliothèque. Présenté à Monseigneur le President de Mesme*, Paris 1627, p. 101; idem, *Apologie pour tous le Grand Personnages qui ont esté faussement soupçonnés de Magie*, La Haye 1653, p. 331. See also L. Bianchi, "Des novateurs modernes en la philosophie: Telesio tra eruditi e libertini nella Francia del Seicento", in *Bernardino Telesio e la cultura napoletana*, eds. R. Sirri & M. Torrini, Napoli 1992, pp. 373-416, p. 379-80, quotes Mersenne, *La vérité des sciences contre les sceptiques ou Pyrrhoniens* (1625), p. 33.

¹¹ Cf. L. Bianchi, "Des novateurs modernes en la philosophie".

¹² J. Prins, "De invloed van Telesio in Engeland", p. 160, note 23, cites Otto Casmann, *Somatologia*, Frankfurt 1607, and from its popularity on the continent he hypothesizes a diffusion of this work also in England.

¹³ I owe many references of Telesio's presence in England to the afore mentioned studies of Jan Prins.

¹⁴ As results from G. R. Batho, "The library of the Wizard Earl: Henry Percy, ninth earl of Northumberland", in *Library* 15(1960), 246-61, and from a written communication by Batho to Jan Prins; cf. Prins, *Walter Warner*, 133, note 251.

¹⁵ P. Lefranc, *Sir Walter Raleigh écrivain*, p. 438.

¹⁶ See H. Gatti, "Minimum and maximum, finite and infinite. Bruno and the Northumberland Circle", on p. 147, note 11: "Telesius (sic) 9 lib et De Cometis de iride etc."

¹⁷ See Prins, *Walter Warner*, 133, who quotes BL Add. MS 4394, f. 135v: "(...) all those alterations of the pulse or motion of the hart which are comonly observed to follow or accompany the passions and perturbations of the mynde which are in gret variety (for which examine Galen & Telesius) do manifestly argue a continuation of these pulsatory spirits with those of the intellect or ratiocination or a dependence of the one on the other (...)".

¹⁸ Prins, "De invloed van Telesio in Engeland", p. 157.

¹⁹ See V. Giachetti Assenza, "Bernardino Telesio: il migliore dei moderni. I riferimenti a Telesio negli scritti di Francesco Bacone", in *Rivista critica di storia della filosofia* 35(1980), 41-78. For corrections on this paper, see L. De Franco, *Introduzione a Bernardino Telesio*, Roma 1995, pp. 389-95.

²⁰ *The Philosophical Works*, 7 vols., eds. J. Spedding, R.L. Ellis, and D.D. Heath, London 1857-74, vol. IV, p. 398. For discussion, see K.R. Wallace, *Francis Bacon on the Nature of Man, the Faculties of Man's Soul: Understanding, Reason, Imagination, Memory, Will, and Appetition*, Urbana-Chicago-London 1967, 16; and V.K. Whitaker, "Francis Bacon's intellectual milieu", in *Essential Articles for the Study of Francis Bacon*, 28-50, on pp. 29 and 44.

²¹ *Works*, vol. V, p. 495.

²² *Works*, vol. III, 65-118, and vol. V, 461-500.

- ²³ *Academiarum Examen*, London 1653, in A.G. Debus, *Science and Education in the Seventeenth Century*, London 1970, p. 188.
- ²⁴ A. Pacchi, "Una 'biblioteca ideale' di Thomas Hobbes: il Ms. F2 dell' Archivio di Chatsworth", in *Acme* 21(1968), 5-42, on p. 38, under n° 803.
- ²⁵ See K. Schuhmann, "Hobbes and Telesio", in *Hobbes Studies* 1(1988), 109-133.
- ²⁶ P.E. Ariotti, "Toward absolute time: continental antecedents of the Newtonian conception of absolute time", in *Studi internazionali di filosofia* 5(1973), 141-168.
- ²⁷ For a general description of Telesio's psychology, see my "Telesio's reform of the philosophy of mind", in *Bruniana & Campanelliana* 3(1997), pp. 123-143.
- ²⁸ See *De rerum natura*, V.3, 214-220.
- ²⁹ *De rerum natura*, VIII.3, 172, c. 11-12, 208-220 and c. 21, pp. 294-96. For discussion of the divine soul, see my "Elementi aristotelici e polemica anti-peripatetica nella dottrina dell'anima divina di Telesio", in *Verifiche* 21(1992), 351-370.
- ³⁰ This idea has a Stoic origin. The Stoics thought that survival and welfare of animals and human beings depended essentially on the adequacy of their cognitions. See G. Watson, *The Stoic Theory of Knowledge*, Belfast 1966, ch. I, and M. Frede, "Stoics and Skeptics on clear and distinct impressions", in *The Skeptical Tradition*, ed. M. Burnyeat, Berkeley 1983, 65-93, on pp. 66-7.
- ³¹ *De rerum natura*, V.9, p. 254-58. See also VII.4-5, pp. 14-18; VII.3, pp. 8f; VIII.10, p. 204; and VIII.21, p. 268.
- ³² See *De rerum natura*, V.11, p. 270; cf. c. 27, 364, l. 21-23.
- ³³ *De rerum natura*, V.12, 274-78. See also V.27, 360-64: animals are governed like cities. Cf. V.34, 406: animals are like ships, with different parts, a number of sailors, a captain, etc.
- ³⁴ *De rerum natura*, V. 13-14.
- ³⁵ *De rerum natura*, V.13, 286-90; see also *Quod animal univrsum ab unica animae substantia gubernatur. Contra Galenum* in *Varii de naturalibus rebus libelli*, critical edition with an Italian translation by L. De Franco, Firenze 1980 (first edition: Venice 1590).
- ³⁶ *De rerum natura*, V.14, 292-302; cf. V.12, 274.
- ³⁷ Cf. also *De rerum natura*, V.12, p. 278-80.
- ³⁸ *De rerum natura*, VII.4, 14-16.
- ³⁹ *De rerum natura*, VIII.29, p. 298. As a matter of fact, Aristotle's position was slightly different. According to Aristotle, sense perception occurs when sense organs are affected by external stimuli; it consists essentially in the production of sensory representations called "phantasmata". The latter are not identifiable with iconic (or pictorial) images, however, because they comprise elements of all five senses.
- ⁴⁰ For a critique against Aristotle's conception of phantasy, cf. *De rerum natura*, V.39, p. 444.
- ⁴¹ *De rerum natura*, V.31, p. 386-88. For a similar position, see Agostino Doni, *De natura hominis*, Basileae 1581, II, c. 21, f. 106f: "Cum imaginatur spiritus, recolit omnino secum formas motuum, quos antea in se effecerit dum ad sensibilia moventia moveret se sicut exposuimus, vel omnino illis assimilēs." This work is now available with an Italian translation in L. De Franco, *L'eretico Agostino Doni. Medico e filosofo cosentino del '500*, Cosenza 1973.

- ⁴² *De rerum natura*, VIII.2-3, 164-172; VIII.9, 200f. The context of this valuation is the refutation of the Peripatetic doctrine of the hierarchy of cognitive faculties, from p. 190 onward. This refutation is built on the methodological rule, expressed in VIII.16, p. 240: "Non modus, sed res". For discussion, see my "Elementi aristotelici e polemica anti-peripatetica nella dottrina dell'anima divina di Telesio", in *Verifiche* 21(1992), 351-370.
- ⁴³ *De rerum natura*, VIII.28, 294 and c. 29, p. 298. Memory requires the continuous attention of the spirit: cf. VIII.10, p. 204: "Nam praeteritorum motuum memoria cognitioque ut remaneat, et dum iis suo vetus, intentus iis sit spiritus et cessantes eos saepius recolat oportet."
- ⁴⁴ *De rerum natura*, VIII.3, 170.
- ⁴⁵ *De rerum natura*, VIII.3, 164-172.
- ⁴⁶ Recall that all mental states, also those of the divine soul, are strictly sense-dependent: cf. *De rerum natura*, VIII.6 and 15.
- ⁴⁷ *De rerum natura*, VIII.7, p. 186.
- ⁴⁸ See *De rerum natura*, VIII.28, p. 294-96.
- ⁴⁹ *De rerum natura*, VII.5, p. 16: "(...) et mobilem sui natura, motum scilicet propriam ipsius esse operationem summopereque eo oblectari servarique."
- ⁵⁰ *De rerum natura*, VIII.6, p. 182.
- ⁵¹ Cf. *De rerum natura*, V.14, pp. 292-300.
- ⁵² *De rerum natura*, VIII.3, p. 172: cf. VIII.20, p. 294: intellection occurs through "recolitio".
- ⁵³ *De rerum natura*, VIII.2, p. 162: "Motuum enim, cuius cognitio servata est, saepius diligenterque recolens, ad reliquos, quibus cum illo moveri solebat, veluti excitur et quasi manducatur." Cf. VIII.10, p. 204 and V.12, p. 282-84: "memoria motuum servetur".
- ⁵⁴ *De rerum natura*, VIII.7, p. 188; cf. V.12, p. 280-82.
- ⁵⁵ *De rerum natura*, VIII.10, p. 204.
- ⁵⁶ *De rerum natura*, VIII.29, p. 298-300: intellection is "praeteritorum praesentiumque motuum collatio".
- ⁵⁷ Diogenes Laertius, *Lives*, X.49-50; cf. Lucretius, *De rerum natura*, IV.722-31, and 749-51.
- ⁵⁸ *Adv. Math.*, VIII.336a. The *ennoia* gathers a number of impressions into an overall view; cf. E. Asmis, *Epicurus' Scientific Method*, Ithaca(N.Y.)-London 1984, p. 63.
- ⁵⁹ Cf. G. Watson, *The Stoic Theory of Knowledge*, Belfast 1966, ch. I-II for a detailed discussion.
- ⁶⁰ The soul is located in the workings of a centralized system accounting for the body's functionings.
- ⁶¹ Diogenes Laertius, *Lives*, VII.157-158. As a matter of fact, they resume Plato's doctrine exposed in *Theaetetus*, 151-56.
- ⁶² See *De anima*, II 4-5 and *Physics*, VIII.4, 255a30-b5. For discussion, see M.L. Gill, "Aristotle on selfmotion", in *Aristotle's Physics. A Collection of Critical Essays*, ed. L. Judson, Oxford 1995, second edition (first edition 1991), 243-265.
- ⁶³ See *De anima*, III.5 and *Metaphysics* XII. See also *Metaphysics*, 1032a-b, for the possibility of the soul originating motion without itself moving.

⁶⁴ Cf. *De anima*, 403b28-31; see also 407a32-34, for a rejection of Plato's view of the soul's movements and its moving the body.

⁶⁵ The soul may be subject to incidental motion, in the sense that the body which contains the soul moves or is moved by the soul: cf. *De anima*, 408a30-33 and 411a26f. See also *Metaphysics*, 1048b18-36 and 1050a34-36; and *Physics*, 247b10-14.

⁶⁶ *De anima*, III.4. 429a14.

⁶⁷ Notice that Avicenna rejected the use of terminology of motion in the explanation of the specific "passio" involved in sense perception; see *Liber de anima*, ed. S. van Riet, 2 vols., Louvain-Leiden 1968-1972, vol. I, p. 129 (cf. pp. 95-96). See also Averroes, *Commentarium magnum in Aristotelis De anima libros*, ed. F. St. Crawford, Cambridge (Ma.) 1953, pp. 216-17.

⁶⁸ *Metaphysics*, 1072a27-30. In the same context, Theophrastus described the operation of the active intellect as *kinon*. See Themistius, *In libros Aristotelis De anima paraphrasis*, ed. R. Heinze, Berolini 1899, p. 108, II. 22-28; cf. 102, II. 26-29; for discussion, see E. Barbotin, *La théorie aristotélicienne de l'intellect d'après Théophraste*, Louvain-Paris 1954, 105-125.

⁶⁹ For Avempace's position, see Averroes, *Commentarium magnum in Aristotelis De anima libros*, p. 400. Cf., furthermore, Siger of Brabant, *Quaestiones in tertium de anima*, in *Quaestiones in tertium de anima, De anima intellectiva, De aeternitate mundi*, ed. B. Bazán, Louvain-Paris 1972, q. 2, p. 6, and q. 8, p. 25. Notice that Siger in this work still subscribed to the thesis of classical Averroism (see p. 57). For a thorough criticism of the intellect-motor thesis, see Thomas Aquinas, *De unitate intellectus*, in *Opera omnia*, tomus XI.III, Roma 1976, cap. 2, pp. 304-306; cf. *Liber de Veritate Catholicae Fidei seu Summa contra Gentiles*, ed. C. Pera, 3 vols., Torino 1961, liber II, cap. 68.

⁷⁰ John Duns Scotus, *Ordinatio*, in *Opera omnia*, ed. C. Balic c.a., vol. III, Città del Vaticano 1954, liber I, dist. 3, q. 1, p. 235: "Ad quantum dico quod intellectus non tantum patitur realiter ab obiecto reali, imprimente talem speciem realem, sed etiam ab illo obiecto ut relict in specie patitur passione intentionali: et illa secunda passio est 'receptio intellectionis'—quae est ab intelligibili in quantum intelligibile, relucens in specie intelligibili—et illud 'pati' est 'intelligere', sicut patebit in quaestione proxima. Cum ultra deducis quod intellectio 'non est motus rei ad animam', non sequitur, quia impressio speciei est quidam motus rei ad animam, quatenus res habet 'esse' in illa specie; intellectio etiam sequens impressam speciem, est motus rei ad animam, quatenus per intellectionem obiectum habet 'esse' in anima actualiter cognitum, quod prius tantum habuit 'esse' habitualiter." Cf. *Ordinatio*, I, dist. 3, q. 1, p. 203. Cf. Hervaeus Natalis, *De intellectu et specie*, in P. Stella, "La prima critica di Hervaeus Natalis O.P. alla noetica di Enrico di Gand: il *De intellectu et specie* del cosiddetto *De quatuor materiis*", in *Salesianum* 21(1959), 125-170, on pp. 155 and 161; and Godfrey of Fontaines, *Quodlibet*, IX, ed. J. Hoffmans, Louvain 1928, q. 19, p. 272.

⁷¹ Petrus de Bruxellis (Crokart), *Argutissime, subtiles et secunde quaestiones physiques (...)* in octo libros *Physicorum et in tres de Anima (...)* *Aristotelis*, Parisiis 1521, (first and second edition, respectively, 1510 and 1515); unnumbered files, III, q. 2, a. 2: "Dicitur autem talis motio abstractio cum quia intellectus est superior causa quantum a fantasma. a quo dicitur fieri abstractio tum quia ex parte intellectus est aliqua virtus activa que habet effectum causatum a fantasmate. et ideo videtur quod quasi intellectus trahat ad se speciem."

⁷² "Utrum sit dare intellectum agentem", in *Averroisme bolonais au XIVe siècle*, ed. Z. Kuksewicz, Wrocław-Varsovie-Cracovie 1965, p. 305, where Matthew of Gubbio appealed to Averroes, *In De anima*, III, c. 18; cf. also his *Quaestiones de anima*, ed. A. Ghisalberti,

Milano 1981, 173-74. See "Utrum species vel imago, que est organum mediante quo aliqua res cognoscitur, (...) cognoscitur", in *Averroisme bolonais*, 309: "Ideo est sextus et ultimus modus dicendi, et est magistri Mathei de Eugubio, et est, quod ista species seu fantasma movet intellectum solum delative, non autem impressive nec cognitive, et loquor quando mediante ea intellectus intelligit obiectum extra illam speciem. (...) sicut effectus defert causam." Cf. idem, 310: "Ut ultra dicis: postea species existens in cogitativa producit speciem in intellectu. Verum est, non quia moveat intellectum cognitive, sed solum delative, sicut non videbas species et ymagines existens in aere, nisi solum delative."

⁷³ *Commentaria in III. libros Sententiarum*, Venetiis 1564, 175ra.

⁷⁴ *Idiota de mente*, ed. L. Baur, in *Opera omnia*, vol. V, Lipsiae 1937, c. 8, p. 81.

⁷⁵ *In eam partem iii. libri Aristotelis de anima, quae est De Mente Humana lectura*, Ferrariae 1576, 393 and p. 433.

⁷⁶ *Quaestio de Spetibus Intelligibilibus*, in *Opuscula*, Neapoli 1578, 31v-36v, p. 35vb.

⁷⁷ *De rerum natura*, VIII, 29, pp. 296-300.

⁷⁸ Cf. the polemics with Aristotle's, too narrow, conception of phantasy. Telesio argued that the Aristotelian phantasy depends on stored images. For a similar position in modern psychological research, see R. Gregory, *Concepts and Mechanisms of Perception*, London 1975, p. 628. There is an extensive contemporary discussion as to whether mental images are pictorial, descriptive or iconic. Cf., inter alia, Z.W. Pylyshyn, "Imagery and artificial intelligence", in J.M. Nicholas (ed.), *Images, Perception and Knowledge*, Dordrecht 1977, 170-194; idem, "Mental pictures and cognitive science", in *Philosophical Review* 92(1983), 499-541; K. Sterelny, "The imagery debate", in *Philosophy of Science* 53(1986), 560-583; S. Kosslyn, *Image and Brain. The Revolution of the Imagery Debate*, Cambridge (Ma.) 1994.

⁷⁹ See, for a general discussion of the inner senses in medieval philosophy, H.A. Wolfson, "The internal senses in Latin, Arabic, and Hebrew philosophical texts", in idem, *Studies in the History of Philosophy and Religion*, vol. I, Cambridge 1973, 250-314.

⁸⁰ During the Middle Ages, Godfrey of Fontaines, Peter Olivi, Rudolph Brito, Thomas Sutton, and John Baconthorpe tended to assimilate species and cognitive act. During the Renaissance, Lefèvre d'Étaples, Charles de Bovelles, Tiberio Bacifieri, Nicoletto Vernia, Ludovico Buccaferrea, Francesco Vimercato, and Jacopo Zabarella developed a similar position. For these authors, see my *Species intelligibilis. From Perception to Knowledge*, 2 vols., Leiden 1994-95.

⁸¹ See Thomas Wilton, *Quaestio disputata de anima intellectiva*, ed. W. Senko, in *Studia Medievistyczne* 5, Warszawa 1964, 119; Gregory of Rimini, *Lectura super primum et secundum Sententiarum*, eds. A.D. Trapp, V. Marcolino, et alii, 5 vols., Berlin-N.Y. 1979-84, *Super I*, dist. 3, q. 1, 352; John Buridan, *In tres libros de anima, in Quaestiones et decisiones physicales (...) Alberti de Saxoni (...) Buridani in Aristotelis (...)*, ed. Georgius Lokert, Paris 1518, f. 3ra; Paul of Venice, *Summa philosophiae naturalis*, Venetiis 1503 (reprint Hildesheim-N.Y. 1974), 90vb, and idem, *In libros Aristotelis de anima explanatio*, Venetiis 1504, 137rb; Jacques Lefèvre d'Étaples, *Paraphrasis trium de anima complectorum*, in *Philosophiae naturalis Paraphrasis*, Parisiis 1525 (first ed. 1492), 224r; Pietro Pomponazzi, *Corsi inediti dell'insegnamento padovano*, 2 vols. ed. A. Poppi, Padova 1966-1970, vol. I, 204; Girolamo Fracastoro, *Opera omnia*, Venetiis 1574 (2nd ed.), 129r-v; H.L. Castaneus, *Celebriorum distinctionum philosophicarum synopsis*, Lugduni Batavorum 1645, 101; Francisco Suarez, *De anima*, in *Opera omnia*, ed. nova D.M. André, tomus III, Parisiis 1856, 722a-28a; Collegium Complutense, *Disputationes in tres libros Aristotelis de*

anima. Iuxta miram Angelici Doctoris D. Thomae, & Scholae eius doctrinam, Lugduni 1637, 300a and 307b.

⁸² Suarez, *De anima*, 730b.

⁸³ Suarez, *De anima*, 732a f. At the turn of the 13th and 14th centuries, a similar position was held by Richard of Middleton and Thomas Sutton. See also Descartes, *Oeuvres*, vol. III, pp. 474-75: knowledge of the external world is mediated through ideas; we check the adequacy of these ideas by a comparison with other ideas, not by comparing these ideas with external objects.

⁸⁴ Telesio levelled a heavy attack onto the Aristotelian faculty psychology; cf. *De rerum natura*, book VIII. Warner rejected the real distinction between rational and irrational powers; see Prins, *Walter Warner*, 57, 78. Although he did not completely abandon the traditional psychological distinctions (cf. *idem*, 118-125, 136, 153-54, 158, and 161-164), he attributed the functions of reception, retention and representation to one faculty (*idem*, 136). He regarded faculties as forces of the different parts of the spirits: in this sense they are substances; *idem*, 251-52. In Thomas White's "*De mundo*" examined. The Latin translated by H. Whitmore Jones, London 1976, Hobbes stated that man's intellectual faculties do not differ from those of animals except in degree; see p. 353. Elsewhere, he defined faculties as accidents of bodily substances, and explained their operation in terms of motion; *Opera latina*, vol. I, p. 114; *The Elements of Law Natural and Politic*, ed. F. Tönnies, London 1889, 28-29. Hobbes thought that sensation implies already distinguishing and comparing; cf. *Opera latina*, vol. I, 320.

⁸⁵ See *De rerum natura*, V.2, 210; VIII.15, pp. 232-36. See also above, section 2.

⁸⁶ In the *Short Tract*, Hobbes defined the animal spirits as instruments of sense and motion; cf. Thomas Hobbes, *Court Traité des Premiers Principes. Le Short Tract on First Principles de 1630-1631. La naissance de Thomas Hobbes à la pensée moderne*, texte, traduction et commentaire par Jean Berubardt, Paris 1988, pp. 40-42.

⁸⁷ See K. Schuhmann, "Hobbes and Telesio", 118-119.

⁸⁸ His physiological and psychological research relied on medical authorities, such as Galen and his 16th-century followers, such as Archangelo Piccolomini, Varolius, Bauhinus; cf. J. Prins, *Walter Warner*, p. 66, and ch. 3.1.

⁸⁹ Prins, *Walter Warner*, 130. Like Telesio, Warner rejected Galen's theory of three different spirits; cf. also pp. 90-95.

⁹⁰ Prins, *Walter Warner*, 78, and note 124. Warner endorsed the view that the cosmos is constituted by matter composed of atoms enclosed by a radiating force setting these atoms in motion; cf. pp. 22, and 45ff on the possible relations with Bruno and the traditional light metaphysics.

⁹¹ Prins, *Walter Warner*, 132-33.

⁹² Prins, *Walter Warner*, 176, 261.

⁹³ Prins, *Walter Warner*, 139-147.

⁹⁴ BL Add. MS 4395, f. 42, quoted in Prins, *Walter Warner*, 151: "(...) by way of sensation habitually informed with impressions or characters or sigils or <species> or ideas (...) which in respect to their aptitude to be resensated or refantasiated or recognized or reactualated or represented or internally speculated are called notions or concepts or fantasmis."

⁹⁵ Prins, *Walter Warner*, 160-63.

⁹⁶ See *De corpore*, in *Opera Latina*, vol. I, 389, for perception as a phenomenon, and p. 393: bodies are endowed with sense. For a general discussion, see F. Brandt, *Thomas Hobbes' Mechanical Conception of Nature*, Copenhagen-London 1928, 342-50. For the possibly Telesian and (above all) Campanellian background of sense as a property of the body, see *De corpore*, 320, and K. Schuhmann, "Telesio and Hobbes", in *Hobbes Studies* 1(1988), 109-133, on p. 130.

⁹⁷ See also *Tractatus Opticus* I, in *Opera Latina*, vol. V, 220.

⁹⁸ See *De corpore*, 317 and 319: "sensio est ab organi sensorii conatu ad extra, qui generatur a conatu ab objecto versus interna, eoque aliquandiu manente per reactionem factum phantasma." For discussion, see J. I. Eshen, "Reason and perception in Hobbes: An inconsistency", in *Nous* 19(1985), 429-437, on p. 430.

⁹⁹ *De corpore*, 324-25; cf. I. Eshen, "Reason and perception in Hobbes", 431. For another characterization, see *Leviathan*, ed. C. B. Macpherson, London 1968, 1985³, p. 85: thought is representation or appearance.

¹⁰⁰ Cf. *The Elements of Law Natural and Politic*, ed. F. Tönnies, London 1889, 2: "This imagery and representations of the qualities of things without us is that we call our cognition, imagination, ideas, notice, conception, or knowledge of them"; *De corpore*, 317, where the "causa idearum" is identified with "motus". Cf. *Objectiones ad Cartesii Meditationes*, in *Opera Latina*, vol. V, 258f, where Hobbes argued that the idea is not distinct from sensible intuition.

¹⁰¹ Cf. *Opera Latina*, vol. V, 263: the idea of the sun in our soul is a "collectio per argumenta"; Pacchi, *Introduzione a Hobbes*, 35-36, and 61; Zarka, "Empirisme, nominalisme et matérialisme chez Hobbes", 191. See, for a similar position, Pierre Gassendi, *Disquisitio Metaphysica*, ed. B. Rochot, Paris 1962, 135f; 213f; 243f; 283f; 519f.

¹⁰² *Elements*, 2-3; cf. J. Prins, "Kepler, Hobbes and medieval optics", in *Philosophia naturalis* 24(1987), 309-10.

¹⁰³ See also J. Bernhardt, "Grandeur, substance et accident: Une difficulté du *De corpore*", in *Thomas Hobbes. Première philosophie, théorie de la science et politique*, eds. Y. Ch. Zarka & J. Bernhardt, Paris 1990, 39-46.

¹⁰⁴ *De rerum natura*, V.14, p. 296-98

¹⁰⁵ See R. Burton, *Anatomy of Melancholy*, ed. H. Jackson, New York 1977 (2nd ed.), 165.

¹⁰⁶ J. Jacquot, "Harriot, Hill, Warner and the new philosophy", in *Thomas Harriot Renaissance Scientist* ed. J. W. Shirley (Oxford 1974), 112.

¹⁰⁷ F. Bacon, *Works*, vol. II, 430: "The species of visibles seem to be emissions of beams from the objects seen; almost like odours; save that they are more incorporeal: but the species of audibles seem to participate more with local motion, like percussions or impressions made upon the air." In general Bacon showed little respect for Aristotle and avoided the classical terminology of abstraction; see *Works*, vol. IV, pp. 58-59, 69, 88, 292-93, and 344-45. For discussion, see K.R. Wallace, *Francis Bacon on the Nature of Man, the Faculties of Man's Soul*, 45 and R.F. Jones, "The Bacon of the seventeenth century", in *Essential Articles for the Study of Francis Bacon*, ed. B. Vickers, London 1968, 3-27, on p. 5.

¹⁰⁸ Herbert of Cherbury, *De veritate*, London 1645 (first edition 1623, reprint Stuttgart-Bad Cannstatt 1966), pp. 75 and 134.

¹⁰⁹ See above; cf. also Prins, *Walter Warner*, 141-42 (and notes 38-39), 145, and 161 (and note 13).

¹¹⁰ The authenticity of this work (defended by Bernhardt on p. 88) is challenged by A. Pacchi, "Hobbes e l'epicureismo", in *Rivista critica di storia della filosofia* 33(1978), 54-71, on p. 63, note 38, and by R. Tuck, "Hobbes and Descartes", in *Perspectives on Thomas Hobbes*, eds. G.A.J. Rogers & A. Ryan, Oxford 1988, 11-41, on pp. 17-19. Recently, the authenticity of the *Short Tract* has been convincingly established by K. Schuhmann, "Le *Short Tract*, première oeuvre philosophique de Hobbes", in *Hobbes Studies* 8(1995), 3-36.

¹¹¹ On Hobbes' relationship with the medieval and Renaissance optical tradition, see J. Prins, "Kepler, Hobbes and medieval optics", in *Philosophia naturalis* 24(1987), 287-310. See also A. Pacchi, *Introduzione a Hobbes*, Bari 1971, 70; J. Bernhardt, "Hobbes et le mouvement de la lumière", in *Revue d'histoire des sciences* 30(1977), 3-24, on p. 12. On Hobbes' sources, besides the commentary of Bernhardt in his edition of this work, see also F. Brandt, *Thomas Hobbes' Mechanical Conception of Nature*, 385-86. Hobbes' (possible) acquaintance with Grosseteste is discussed by A. Pacchi, *Convenzione e ipotesi nella formazione della filosofia naturale di Thomas Hobbes*, Firenze 1965, 234-43.

¹¹² See *Thomas White's "De mundo" examined*, ch. III.2, p. 41, and ch. XXVII.19. Cf. *De corpore*, 329-30. See in this context also the mind-mirror definition in *De principiis cognitionis*, in M.M. Rossi, *Alle fonti del deismo e del materialismo moderno*, Firenze 1942, 104.

¹¹³ *Thomas White's "De mundo" examined*, ch. XXXVIII.11

¹¹⁴ *De rerum natura*, VIII.3, p. 168.

¹¹⁵ Cf. Prins, *Walter Warner*, 152, 163, 262; for Hobbes, see, inter alia, *Short Tract*, 44.

¹¹⁶ The seed-soul, although different from the body, is affected according to the nature and disposition of the body; see *De rerum natura*, V.35, 416.

¹¹⁷ Cf., for example, *De rerum natura*, VII.10, p. 36.

¹¹⁸ Prins, *Walter Warner*, 159 and 163.

¹¹⁹ *Elements*, 4.

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