INTELLECT AND ORGANISM IN FRACASTORO’S TURRIUS

Of the four dialogues known to have been composed by Girolamo Fracastoro, the three that deal with poetry, intellection, and the human soul first appeared in the posthumous Opera omnia published by Giunta in Venice in 1555; a transcription of the incomplete manuscript of the fourth, on the theology of grace, predestination, and free will, saw the light exactly four hundred years later. The first three of these dialogues, whose composition appears to have occupied Fracastoro at intervals over a considerable number of years, bear the names of two of the companions of his youth and that of the author himself. A coherent series of discussions linked by their subject-matter as well as their rhetorical form, they constitute a kind of philosophical anthropology in which language, thought, and immortality are considered the marks of man’s pre-eminence in the order of nature. The first, Naugerius sive de poetica dialogus, named after the Venetian poet and historian Andrea Navagero, is the best known. The third, Fracastorius sive de anima dialogus, remained unfinished at the time of Fracastoro’s death in 1553. The central work of the series, Turrius sive de intellectione dialogus – less a dialogue than a monologue in this instance, since there are no exchanges between participants – purports to record a discourse on intellection delivered at Fracastoro’s villa at Incaffi in the hills above Lake Garda by the Veronese astronomer Giambattista Della Torre, son of Fracastoro’s medical mentor Girolamo Della Torre and a close friend whose untimely death Fracastoro greatly lamented. The present essay attempts to situate the discussion contained in this work of the human capacities for perceiving, imagining, and reasoning in its proper context, that of Fracastoro’s philosophy of nature as a whole. The view that the life of man, as microcosm, reflects and recapitulates the order of creation, from the elemental to the angelic, is a view which Fracastoro shares with his contemporaries and one which he develops in great detail; but he further insists that, as a living organism, man is subject, even in the exercise of his highest faculties, to the laws which govern the organic whole of which he is a part.

The appearance of the word intellection in the title of a philosophical work written in the first half of the sixteenth century inevitably brings to mind the debate concerning the nature of the intellective soul and the question of its immortality. These issues had been widely discussed throughout the fifteenth century, especially in centres like Padua, where the Aristotelian tradition was strong, and a fresh and vigorous phase in the debate had been initiated in 1516 with the publication in Bologna of Pietro Pomponazzi’s Tractatus de immortalitate animae. The controversy
provoked by this treatise had barely subsided by the time Fracastoro was at work on the *Turrius*, and he could hardly have ignored such an important contemporary debate as that concerning the immortality of the soul. However, he is careful to separate this issue, which is the principal subject of the *Fracastorius*, from what can be said about the intellect from the standpoint of natural philosophy; and what is striking about the *Turrius* is that it considers intellection without any reference to the ontological status of the soul or to the problem of immortality, with scant regard even to the multiplicity of intellects which the Aristotelian tradition had variously proposed in its attempts to wrestle with these and related problems. When discussing the formation of universal concepts, Fracastoro refers, it is true, to the Averroist doctrine of a separately existing agent intellect to which the individual human soul is supposedly attuned for the purpose of abstracting the universal element from sense experience. But [237] he refers to it only to dismiss it as superfluous: ‘if we are able to form universals on our own account unaided by any separate intellect, it would be as well to relieve this abstract intellect of the task: subsisting as it does outside of us, it is content enough with itself, and allows us to conduct our own activities’.\(^7\) This comment epitomizes Fracastoro’s attitude to the problems dealt with in his treatise; for he believes that they can all be adequately discussed, formation of universals included, without transgressing the limits of naturalistic explanation. His anti-metaphysical stance is evident from the very first paragraph of the work, in which he sets out, in Aristotelian fashion, the importance of the inquiry he is about to undertake. He points out that our human limitations are such that we can derive little from metaphysics, whereas knowledge of the world around us is both attainable and rewarding.

That ancient theology known indifferently as divine or first philosophy examines truly noble and imperishable things. However, so few of them can be known to us, and then our knowledge of them is so uncertain, that we may as well confess that no knowledge, or next to none, has come our way in such matters. On the other hand, we can achieve no small certainty with regard to those things which belong to the realm of nature, and nevertheless have some nobility, such as substances and bodies, the heavens, and living things; and what can be known is practically limitless, inasmuch as nature is everywhere, wherever we turn, whatever we see or hear. On this account, the philosophy that deals with these things is to be considered, among all others, the greatest and the most worthwhile.\(^8\)

Aristotle had argued – this was just one of the arguments rehearsed in the debates about immortality – that ‘if there is among the functions or affections of the soul one that is peculiar to it, it will be possible for the soul to be separated from the body’; and, if there were such a function that could be exercised independently of the body, thinking seemed to him to be the most likely candidate.\(^9\) While Fracastoro affirms
that the intellective soul has a function [238] peculiarly its own, and so the inference
as to its separability may be drawn, this function, or *propria operatio*, is not thinking,
but what in the *Fracastorius* he calls the ‘life of the spirit, on account of which a man is
said to be born again and to be renewed, as if he had shed all that is bodily and lives,
like God, entirely in the spirit’; and this life of supernatural virtue is impossible
without the intervention of divine grace: ‘since the goal of this life, which is called the
life of the spirit, is the enjoyment of God, it cannot be perfected except through Him
and with His aid’.\(^{10}\) Consequently, at the end of the *Turrius* Fracastoro excuses
himself for having failed to consider this aspect of the life of the soul, in which the
body has no part, saying that it does not fall within the scope of his treatise: he has
been concerned simply to give an account of those intellectual operations which
demand the cooperation of body and soul, of sense and intellect, and are
characteristic of the composite human being as a whole.\(^{11}\)

The composite human being was a vital concern of Fracastoro’s, its study a
professional duty, as it were, laid upon him by his medical vocation. It was at Padua
that, already lecturer in logic, he was awarded his arts degree on 5 November 1502,
before proceeding to his medical studies and a subsequent appointment as
*conciliarius anatomicus*, or tutor in anatomy.\(^{12}\) As an arts student his principal course
of study would have involved Aristotelian logic and natural philosophy, expounded
with the aid of Aristotle’s chief commentators; and his approach in the *Turrius* clearly
derives from that Paduan tradition of natural philosophy which had in his own
teacher, Pietro Pomponazzi, one of its most formidable representatives. It was a
tradition that went back to Pietro d’Abano, who had taught Aristotelian science and
Galenic medicine at Padua in the early years of the fourteenth century and had
strongly influenced the shape of the curriculum of the Italian medical schools,\(^{13}\) and,
in a particular way, to Biagio Pelacani da Parma, the mathematician and philosopher
of nature who had taught at the Studio between 1382 and 1387. The content of
Pelacani’s lectures on Aristotle’s *De anima* and his scepticism with regard to the
possibility of [239] reconciling the demands of faith with those of reason anticipate
Pomponazzi more than they do the questioning but religiously orthodox Fracastoro;
but Fracastoro inherited Pelacani’s robustly naturalistic approach to the question of
the intellect, which Pelacani declared could be known only through an analysis of its
operations.\(^{14}\) In the *Turrius* discussion of these operations occupies roughly one half
of the work and is flanked by a consideration of issues which set the treatise in a
broader scientific context. The significance of the discussion with which the treatise
opens, concerning *species*, the means whereby information is conveyed from the
outside world to the soul, can only be fully appreciated when the important role that
the doctrine of *species* plays in Fracastoro’s natural philosophy has been understood;
and the lengthy treatment, with which the work concludes, of the pathology of the intellect, of temperament, and of the anatomy of the brain reminds us that, however wide the range of Fracastoro’s interests, he was by profession and training a physician. The *Turrius* represents a view of intellection arrived at by a thinker whose approach to the workings of the human mind, as to the phenomena of nature in general, is governed by a search for naturalistic explanations and by the philosophical concerns fostered by the medical education he received at Padua at the dawn of the sixteenth century.

By intellection Fracastoro understands ‘all cognitive activity that in the wake of sense perception is carried out by the soul within’. Intellection involves an affection of the soul: this cannot be brought about directly by external objects, but requires an intermediate element, communicated by way of the senses to the intellect. This element is provided by the likenesses (*simulacra*) of things, for which Fracastoro employs the usual Scholastic term *species*. The sanction in Aristotle for the concept of *species* is the notion that in sense perception what is received are ‘perceptible forms without their matter, as wax receives the imprint of the ring without the iron or the gold’. Aristotle’s ‘form’ (*εἴδος*) is the blueprint that at every level lies behind the cohesive structure of a thing; it informs a certain quantity of stuff and determines what the resulting entity is to be. The *species* is this form in so far as it can be grasped by the senses and manipulated in the processes of thought, and it was in this psychological sense that the term was generally used by medieval thinkers. Among some of those who concerned themselves with natural philosophy, however, a broader sense of the term was current, and Fracastoro revives and adapts this usage to his own vision of the universe of natural phenomena. Species, he tells us, are spontaneously emitted by things and radiate in orbital fashion wherever the diaphanous medium through which they travel is receptive to them. (In the external world this medium is, generally, the air; within the living organism, the spirits.) Although for his purposes in the *Turrius* it is enough to say that their task is to represent to the soul the objects of which they are *species*, he acknowledges that, on another occasion and in another connexion, more ought to be said about their nature. That other occasion, to which the conventions of the dialogue form preclude more specific reference, was offered by a work of fundamental importance for an appreciation of Fracastoro’s philosophical outlook, the treatise *De sympathia et antipathia rerum*, which forms a general introduction to his work on communicable diseases, *De contagione*, first published in 1546. *De sympathia* is an inevitable point of reference in any discussion of the coherence of Fracastoro’s thought; and what he there says about *species* is significant for an understanding of the fact that
psychology, as elaborated in the *Turrius*, is essentially an aspect of ‘physics’, of that philosophy of nature (φύσις) that underpins all Fracastoro’s medical, scientific, philosophical, and even aesthetic concerns.

The sympathy of which Fracastoro speaks in *De sympathia* is the ‘latent harmony of things’ (*latens rerum consensus*), the ultimate force for cohesion in a universe characterized above all by order and obedience to natural laws; for ‘nature tolerates nothing, admits nothing that is purposeless and that frustrates the order and laws of the universe’.21 It is this harmony which arouses the wonder of philosopher and poet alike, who are so similar in genius, Fracastoro’s [241] spokesman in the *Turrius* concludes, that many poets have been great philosophers and many philosophers have been poets: while the poet gives expression to the beauty inherent in the harmonious arrangement of things, the philosopher investigates the causes that lie behind the order manifest in the visible universe.22 In characterizing sympathy as chief among these causes, Fracastoro is careful to call its power *latens* rather than *occultus*; for he was very scathing in his criticism of those who habitually invoked the ‘occult properties’ of things when they were at a loss for any other explanation.23 Although it cannot be directly perceived or fully explained, the operation of universal sympathy is neither arbitrary nor occasional, but respects and is ultimately explicable in terms of the relationship of natural cause and effect. It is what Aristotelian physics fails to provide: a universal principle of unity in nature. This principle is exemplified in a variety of ways, one being the functions assigned to *species*, which in Chapter 5 of *De sympathia* Fracastoro invokes to explain the mechanisms of action at a distance. A much debated instance of such action was the power of the magnet to attract iron. Since, says Fracastoro, ‘there can be no action [of one thing upon another] except by contact’, the contact in such cases must be effected by ‘something sent out from the one thing to the other, so that it comes into close contact with it and serves as the principle of attraction’.24 This ‘something’ is the *species*, which he describes as a *forma spiritualis*, a spiritual form cast off by the material form of an object. ‘It is an inherent property of all forms, to the extent that they are able, to spread themselves abroad’; material forms do this by producing ‘a subtle, film-like part or degree of themselves, which is called the *epipole* [‘surface’] and which, on account of its subtle consistency, admits no contrary and is generated and propagated instantaneously’.25 It is because it is so fine and is unaffected by the presence of contrary qualities that this form or *species* is called ‘spiritual’:26 it shares that extremely fine grade of materiality characteristic of the spirits which, within the human organism, are the medium of communication between body and soul. Spiritual forms are substantially identical [242] with the material forms from which they proceed, differing only in their grade of existence.27 The exchange of these
spiritual forms between objects constitutes the power of attraction, what Plato in the *Timaeus* refers to as the ‘universal motion by which all kindred substances are drawn towards one another’. Two such kindred substances, A and B, as parts of the whole that they form with their spiritual *species*, tend naturally to come together for their mutual preservation, says Fracastoro; for ‘within that whole the parts clearly do not achieve their proper state of being nor occupy their due place unless they are so drawn together that A and B are united’. In Fracastoro’s conception of action at a distance, spiritual forms or *species* are the means whereby the material forms of things interact causally with one another. In this respect, however imperfectly the detailed mechanisms may be understood, the acquisition of knowledge of the external world is at bottom no more nor less mysterious a natural process than the power of the magnet to attract iron: it is made possible by the relationship, mediated by the appropriate agency, the spiritual *species*, between the form of the object and that of the subject of knowledge. Sense perception, on which the other cognitive processes depend, is a case of action at a distance; as such, it conforms to a pattern of activity exemplified by a whole range of phenomena in the natural world.

Given that intellection ‘appears to be nothing other than the representation of an object within the soul by means of the *species* of that object admitted there’, we may consider the most important features of Fracastoro’s psychological theory by following the *species* on its inward journey. It is the task of the spirits, with which the aerial *species* are in any case cognate, to transmit *species* from the senses to the brain, which Fracastoro acknowledges to be the seat of the intellect, the chief power of the human soul. Diffused through the arteries and nerves, the spirits are ‘of the nature of air’, since, according to Galenic physiology, they are in part refined by the body’s natural heat from the air that we [243] inhale: the arterial spirit in the liver, the cerebral spirit in the brain. As they pass around the body, ‘virtually continuous, like so many clouds’, they perform the functions of what we might now call metabolic and neural messengers. They are themselves bodily products, not bodily parts, and multiply as a result of the action of natural heat, inspired air, and the metabolism of food. It is important for the proper functioning of the intellect that the spirits, as the medium in which *species* are conveyed internally, should be pure and undisturbed, especially those ‘about the seat of the soul’ in the ventricles of the brain. Spirits rendered unsubtle or torpid by extraneous vapours, drink, or drugs disrupt the *species* they carry and are responsible (along with simple inattention) for confused dreams and hallucinations. *Species* can subsist in one of two ways: either as continuous with the objects that emit them or by transferral to the intellect, which is their natural destination as images that represent those objects. They can perform this
task of representation only in the intellect, which is therefore to be regarded, in terms
made familiar by Aristotle’s theory of the elements, as their ‘proper place and proper
matter’. Once the objects that produce the species are withdrawn, they can no longer
affect the sense organs, and so sensation ceases; but the same species, conveyed by the
spirits to the brain, there fulfil their highest function in the service of human thought.

The utterly direct nature of the contact between the soul and species, which have
a physical origin in the external world, while emphasizing the fundamental unity of
perception and thought, raises questions about the soul’s passivity in the face of
external causality and about the formation of abstract ideas. It is in answering these
questions that Fracastoro makes some overt claim to originality in the Turrius. He
says the soul is not, as some would have it, active in deploying species and producing
intellection, but is a passive recipient of species, which, wherever they encounter a
suitable recipient, spontaneously fulfil their function as what are, in effect, natural
symbols. The soul, as the locus proprius of these symbols of things, is simply open to
receive them, and has no active role in their initial apprehension by the mind,
although it may subsequently become active in manipulating them. This initial
mental grasp of external realities is the function of the common sense, the sensus
communis, whose task is simply to make available to the intellect, in all its objective
complexity, an experience which is frequently communicated through two or more of
the individual senses. The common sense ‘grasps sense objects in the same manner
and together with the same conditions with which they were first given to the
senses’. It is crucial for Fracastoro’s theory that species represent objects as they are
met with in experience, together, that is, with their multitude of particular
determinations.

For since a species exists to represent an object and the modes of that
object, this means, for example, that when the eye perceives the species of
colour, it perceives at the same time those things, called modes, that [in
the percept in question] are associated with this colour: number, magnitude, shape, location, position, motion, action, distance,
resemblances, and other relations, and the other things that constitute an
object.

In the first instance, then, the soul is the passive recipient of a potentially
bewildering array of sense impressions. It is in view of this fact that Fracastoro,
normally concerned to simplify and synthesize the complexities of the medieval
faculty psychology, introduces a mental function of which he knows no detailed
treatment and for which he is obliged to invent a name. Given the passive character
of the soul’s initial apprehension of things, the actualization of its intellectual
potentialities depends on the species given in sensation arresting the soul’s attention.
This attention is first accorded them in the mental operation Fracastoro dubs
‘subnotion’.

I call subnotion that cognitive activity in which the soul is moved, as it were, to inspect one by one the many different elements presented simultaneously and in confused order in any single apprehension. It is evident that animals too perform this operation [245] and that it differs from affirmation and reasoning, in which the question of truth and falsehood arises: it is simply and solely the representation of one sense object after another. 38

This fundamental activity of the soul, then, is a spontaneous process whereby the confused complex of representations for which the common sense acts as focus is ordered and clarified. It is rather as if Fracastoro were analyzing Aristotle’s notion of αἴσθησις into the components that the Greek concept fails to distinguish, namely sensation and perception. Sensation being, for Fracastoro, an entirely passive affection of the organism, perception proper begins with subnotion. 39 Every perception, of course, contains a sensation, and the two elements, though conceptually distinct, are in reality inseparable. In this respect subnotion does not correspond precisely to perception, but begins to assume the functions of imagination. For while Fracastoro tells us that subnotion comes into play ‘immediately we are presented with sense objects, while sensation is actually taking place’, he adds that it may also be employed ‘afterwards’. Subnotion, that is to say, may be exercised in respect of the sometimes confused and shadowy species stored in the memory. 40 However, two things are clear: for Fracastoro sensation involves no more than a sentient creature being passively affected in some way, and so is non-intentional, in the sense that it is not consciously directed towards an object; whereas subnotion is intentional in this sense: it is a ‘taking note of’ what is passively received in sense experience and is characterized above all by conscious mental application. 41 ‘For intellection to take place, the presence of species is not enough: mental application and attention are required; for we often fail to see what is before our eyes because we do not give our attention.’ The activity of the soul in subnotion ‘is simply its being applied and directed towards some particular thing’. 42 This activity involves no movement on the part of the soul; it is the soul’s instruments that are active in this sense. Spirits, nerves, and cerebral membranes are all involved when we give our attention to something: ‘the spirits come together in numbers, the nerves and [246] membranes are under tension – which is why we speak of attention – and finally all the vigour and energy of the soul are directed and intent upon some one thing’. 43 The most important function of subnotion, then, is to establish the intentionality of perception, and this appears to be the philosophical justification for Fracastoro’s introduction of the term and for the significance which he clearly attached to it. Why,
in some of its functions, subnotion overlaps with imagination should become clear as we proceed.

The selective attention which, when applied to the content of pre-attentive complex apprehensions, gives us subnotions next bears fruit in a graded series of mental operations all closely connected with subnotion. As the soul’s attention moves from one species to another, it is first drawn to note the similarities and dissimilarities between them. The soul, in Fracastoro’s logical terminology, is said to divide (dividere) the dissimilar in an act of negation and to put together (componere) the similar in an act of affirmation. This process introduces the notion of number, since in order to affirm something of something else we must know them as distinct, as elements each characterized by its own unity. Next in the hierarchy of operations comes the imagination (imaginatio), of which Fracastoro offers a significant, if brief account in terms of the mind’s architectonic and constructive capacities: ‘whereas by means of subnotions we know a multiplicity of things precisely as many and distinct, if we then consider these things as they relate to some whole in which they are associated, we are said to imagine’. Imagination discerns relationships and forges connexions on the basis of perceived similarities and analogies; it has, as it were, a metaphorical function that corresponds to the metonymic function of subnotion in the task of ordering and interpreting experience. The associations with which experience comes to us in the first place, or which we may imaginatively discern for ourselves, are of primary importance in the functioning of the memory, which is said to involve ‘a fresh apprehension of something we had previously grasped, this [247] fresh apprehension being prompted by something we had on a former occasion observed to be associated with what we now apprehend afresh and had related, the one to the other, as associated’. Memories arise spontaneously; where mental search and reasoning (discursus) are required, we have not memory (memoria) but recollection (reminiscentia).

This entire family of related cognitive functions, including subnotion, imagination, and memory, is the work of what Fracastoro calls the phantasia. For this usage, which has the incidental effect of reversing the usual relationship in medieval and Renaissance thought between the terms phantasy and imagination, Fracastoro claims the authority of Aristotle. Speaking of subnotion, he remarks: ‘if anything has been handed on by Aristotle in this connexion, it seems to be covered by the common name of phantasia; for the faculty he calls phantasia has a variety of functions, and among these the first appears to be the one I am now calling subnotion’. This certainly accords with Sir David Ross’s assertion that Aristotle assigns to φαντασία a crucial role in perception, such that ‘sensation would accordingly be reduced to the
level of a mere passive affection which has to be interpreted by φαντασία before it can give any information or misinformation about objects. This may be a misleading interpretation of Aristotle’s thought in this matter, but it corresponds well enough to what can be gathered from the Turrius of Fracastoro’s view of sensation and perception. It is clear that for him phantasia embraces a range of functions concerned with the ordering, clarification, preservation, dissociation, and recombination of the species derived via sense perception from objects in the external world.

The intellect’s capacity for disengaging and relating experiences, as exhibited in subnotion and imagination respectively, is the foundation of all its higher activities. It is what makes possible the formation of abstract ideas, something to which we come only gradually as we become practised in the exercise of the intellect’s more fundamental abilities. Since species are produced only by material beings, it is clear that certain of our notions, God for instance, or causality, have no corresponding species of their own. How, then, are such notions arrived at? Even among the range of material accidents only those which of their nature directly affect the senses possess species: these are the elemental qualities detectable by touch: heat, cold, moisture, and dryness; and the proper objects of the other senses: light, sound, smell, and taste. Magnitude, shape, hardness, softness, roughness, smoothness, rarity, density, etc., have no separate species, for they are simply modes of material forms which do possess species in virtue of the qualities just enumerated. In the case of entities that neither have their own species nor are associated with any other that does, we derive our knowledge of them from things that do possess species, on the basis, once again, of perceived similarities and dissimilarities. It is by analogy with things already known and brought under some general concepts that we arrive at an understanding of what cannot be an object of direct experience. Thus once we understand what is meant by cause, first, mover, corporeal, we can form a notion of God as first cause, first mover, incorporeal. In similar fashion we acquire concepts such as substance, motion, time, and so on.

Given that only material objects produce species, Fracastoro is very insistent that it makes no sense to talk of the intellect doing so. Most Scholastic elaborations of Aristotle’s philosophy of mind had postulated the necessity for an ‘intelligible’ species which, as the vehicle of thought, was parallel to but distinct from the ‘sensible’ species that was the vehicle of sense perception. According to St Thomas Aquinas, for example, the intellect, in the strictest sense, works exclusively with universal concepts, and so the individual as such is not intelligible, is not a proper object of thought. Before it can become one, it must undergo a transformation whereby it is
stripped of all the material conditions and particular determinations with which it was first presented to sense. This transformation is brought about by the agent intellect, which for St Thomas is a capacity of the individual human soul: by a process of metaphysical illumination, [249] the agent intellect is said to abstract intelligible species from the residue of sense experience preserved in the mental images he calls phantasmata and to communicate this new species to the passive or receptive intellect, which acts as a storehouse for intellectual ideas.\textsuperscript{51} The Averroist version of this theory likewise postulates an agent intellect whose task it is to make actually intelligible the universal element that in the individual is only potentially so; rather in the way that light is required if what is potentially visible is actually to be seen. But in the case of Averroes there is, comments Fracastoro, the added absurdity that the agent intellect is a substance entirely distinct from the souls of individual human beings. ‘If I am told that this [separate] intellect produces some new species which is supposed to represent the universal, it seems to me I hear something monstrous; namely that a separated substance creates species, when it is objects that produce species, as their images.’\textsuperscript{52} Fracastoro sees no need for a second, intelligible species and is at a loss to know how such a species could be formed. To talk of the intellect irradiating phantasmata and denuding them of all particular determinations is to speak metaphorically, poetically; philosophically, such language is scarcely comprehensible.\textsuperscript{53}

In Fracastoro’s view, universals can only be arrived at on the basis of an experience of many things that permits comparisons to be instituted and individual elements to be grasped in isolation. Our first experience of snow presents us with a certain quantity of white stuff in some particular conformation, in a certain place, etc. From this single instance it is not possible, especially if we have had no previous practice in forming universal concepts, to abstract the notion of whiteness: we must have had experience of some other whiteness, in the form, say, of milk. The intellect is then in a position to appreciate that snow and milk, though quite distinct, are nevertheless similar in some respect, and that this similarity can be isolated conceptually. Thus separated out, the species of whiteness comes to represent to the mind a feature shared by a great many individual percepts, a feature that can be considered independently of the things [250] in which it has been discovered to inhere. ‘This, then, is how universals are best considered to be formed, if we adopt experience as our guide.’\textsuperscript{54} So the fact that the intellect can arrive at universal concepts on the basis of the knowledge of particulars provided by the senses does not mean that the species given to us in sense perception has to undergo alteration or substitution by some intelligible counterpart. One and the same species serves both sense and intellect, but does so under different conditions. In sense experience it is
confused and associated with a range of accidental concomitants; in intellection it is isolated and distinct, and is thus made universal. This involves no change to the species itself, which remains what it was, a quality of some particular object: it becomes universal only in its character as a representative image. In other words, the species, without losing its identity with particular perceptual experiences, becomes, on account of its implicit relationship with all the other perceptual experiences of the same sort, symbolic of perceptions of that sort. The explanation put forward by Fracastoro, which has its roots in the nominalist tradition so influential at Padua in the late fourteenth and fifteenth centuries, survives in Berkeley’s theory of abstract ideas. Scholastic theories, like those of St Thomas and Averroes, had in the main sought to explain human contact with the eternal realm of abstract, universal ideas by emphasizing the role of an agent intellect in the intellectual transformation of experience. Fracastoro, on the other hand, while acknowledging that the ability to form universal ideas ‘is in a sense divine, and alone is rightly called intellect’, insists upon the fundamental continuity between our intellectual operations and our experience of the external world, and emphasizes the extent to which this continuity reflects the natural processes of cause and effect. He is therefore happy to dispense with intelligible species along with the agent intellect and to adopt a simpler, less metaphysical and more empirical model of the mind.

The hierarchy of intellectual functions analyzed by Fracastoro is constituted in accordance with a principle which governs his thinking in all matters of natural philosophy and which he never tires of repeating: ‘nature appears always to proceed from the less perfect to the more perfect by degrees’. The soul’s functions are continuous and interrelated, each higher function dependent on the lower. They are, nevertheless, really and not just conceptually distinct, and are graded in a way that reflects the hierarchy of excellence in the natural world. ‘Nature has so ordained it that whatever faculties are met with in other living creatures, all of them should be found in man.’ Man, in other words, is endowed with an intellective soul that subsumes the functions of the sensitive soul found in animals, just as the sensitive soul itself subsumes the powers of the vegetative soul of plants. Of the inner senses which receive and manipulate species, some animals possess only the common sense; but the higher animals share with man that group of abilities to which Fracastoro gives the name phantasia. Descartes denied that animals possess consciousness, because he identified consciousness with self-consciousness. By the same token, post-Cartesian philosophy has encouraged us to substitute the word mind for soul in the broad sense the word used to have when all living things were said, by definition, to have souls. The gulf which now separates the intellectual from the merely organic is
much greater than it was for Descartes’s predecessors, and it may come as a surprise to discover how high up the scale Fracastoro draws the line between the distinctively human and animal intelligences. For Fracastoro, all discursive thought may be reduced to one or other of the four modes of reasoning (ratiocinatio) he examines at the beginning of Book II of the Turrius, namely example, enthymeme, induction, and syllogism. Of these four kinds of reasoning, those animals equipped with phantasie may be capable of as many as three, says Fracastoro, leaving only complex induction and syllogism as the undisputed prerogative of the human intellect.

[Fracastoro discusses his four modes of reasoning in the language of propositional logic and can, for example, suggest that terms stand in the same relation to subnotions as propositions do to reasoning. This is natural, since his paradigm of intelligence is man, and he regards intellect, in the traditional manner, as the ability, essentially, to manipulate language, to make effective (rhetorical) and coherent (logical) use of the conventional linguistic symbols behind which stand those natural symbols that are the species of things. Animals may be affected by species, form subnotions, remember, and use imagination; but there is no suggestion that they are capable of linguistic self-expression or abstract thought. Fracastoro is merely saying that animals too can learn from their experiences: not on the basis of a capacity for conceptualization which only language makes possible (and which, in accordance with the principle that the higher functions embrace the lower, governs all aspects of the mental life of humans, from sense perception to philosophical generalization), but on the basis of certain primitive notions which do not require linguistic expression for their exercise. ‘Perhaps other animals are moved by example. For when birds see others of their kind caught in birdlime, they avoid it, supposing something similar will happen to themselves.’

The birds’ caution is, in this instance, a learned response. A more interesting philosophical problem, and one to which Fracastoro devotes a significant amount of space in the Turrius, is posed by activity of another sort: instinctive behaviour and reflex response. It may have crossed the reader’s mind [253] that Fracastoro assigns no place in his analysis of the soul’s functions to a faculty generally accorded particular importance by medieval thinkers, the faculty that Avicenna’s translator, and St Thomas after him, call the vis aestimativa, or ‘instinct’. Animals, says Avicenna,
are endowed with a natural caution whereby ‘instinct apprehends, mixed with sense impressions, intentions concerning what is harmful or beneficial: thus every sheep is afraid of a wolf, even though it may never have seen one or been harmed by one’. St Thomas repeats this frequently repeated example and argues that, since ‘the animal must perceive intentions of this kind, which no external sense perceives’, there has to be an internal sense to carry out the task. This cannot be the common sense, which, together with the particular senses, is responsible for apprehending the forms of things accessible to sense. ‘To the task of grasping intentions which are not objects of sense perception, instinct is assigned.’

To Fracastoro’s mind, this is tantamount to claiming that the soul derives one species (the intention of hostility) from another (the sensible form of the wolf, as given to sense perception); and such an idea clearly runs counter to his conception of species as produced exclusively by objects. His own solution to the problem brings us back to the concept of the hidden harmony that ultimately governs all natural phenomena.

It must be born in mind, as I said before, that species represent things, and also the modes or concomitants of things. Now, among these modes the chiefest and most intimate are the conformity or lack of conformity of given objects with the soul. For every species is received by the soul as either compatible and good and pleasing, or as incompatible and bad and displeasing. This occurs for the reason that, just as things exhibit harmony and disharmony among themselves, so too do the species which represent them.

Thus the species of the wolf is received by the sheep precisely as the image of something antipathetic. The receptive faculty is the phantasia, which simply receives species in accordance with the modes that necessarily accompany them.

In Fracastoro’s view, to call this capacity aestimativa serves no useful purpose; any more than to talk of ‘an instinct of nature’ (instinctus naturae) actually explains anything. It depends, in the first place, on what is meant here by nature. For everything in nature has, as Aristotle puts it, an ‘inherent impulse to movement’. Even the simplest of inanimate bodies has its characteristic movement and its ‘proper place’, in which it naturally comes to rest; and this is true also of the animal organism, in so far as it is ultimately compounded of the elements. However, this is insufficient to explain instinctive behaviour of the sort under consideration, because the movement of a natura simplex, of a natural body of the simple kind, either up, or down, or of parts within the whole, is directed always towards a single goal, its natural terminus ad quem; whereas the complex behaviour of an animate being may be directed in many different ways to a great variety of ends. However, the term nature is applied by Aristotle not only to ‘the primary underlying matter of things which have in themselves a principle of motion and change’, but more properly to their
Form, as specified in the definition of the thing. Form, as we have already remarked, is that in virtue of which a thing is what it is; in virtue of which it moves, or grows, or alters in some definite fashion, and finally comes to rest when the goal of movement, growth, and change has been achieved. In animate beings this form is, of course, the soul, which, as the principle of organization within the living organism, governs the behaviour of the whole for the good of the whole. Thus, says Fracastoro, ‘all the movements so wonderfully instigated by the soul are reducible to movements of parts within the whole’; that is, as he explains at greater length in Chapter 4 of De sympathia, to a process of condensation and rarefaction, or constriction and dilation. Given the soul’s powers of cognition, however, this movement is not directed to a single end, ‘but to different ends, according as the soul is informed [255] by different species’. Thus, ‘in so far as it is cognizant and is informed by species’, a living creature ‘has, conformably to its nature, an inborn movement of parts within the whole, whereby they are positioned now one way now another, as is best in response to this or that species. It is this, perhaps, that some call instinct’. The sheep receives the species of the wolf as discordant, and responds appropriately to what the phantasia conveys. The physiology of this response, dependent on the harmony that exists between the phantasia (the faculty ‘assigned to the whole as servant and judge in those things that pertain to the whole’) and the heart and the spirits (respectively, the source and instruments of animal motion), is outlined in Chapter 16 of De sympathia.

The mechanism of movement designed to serve the organism’s best interests is the same in the case of involuntary reflex, although what prompts the reflex may be the direct stimulation by a species of some bodily part without, initially at least, the involvement of the phantasia. This case, however, and that of instinctive animal behaviour like web-spinning, nest-building, and so on, raise another problem: to what extent are such actions performed with a purpose of which the creature or bodily member can be said to be aware? There are those, replies Fracastoro, who deny that natural instinct or cognition of any kind is involved in the wonderfully complex and provident behaviour often exhibited by animals, claiming instead that brute creatures are directed in their actions by some superior intellect that knows the ends for which everything is done. But to ascribe the spider’s web directly to God rather than to the spider is to avoid an explanation rather than to offer one. If we take the case of something as fundamental as natural heat – which is the generative power (spiritus genitivus) within the living organism – it clearly performs its functions of heating, attracting, and repelling with no thought to the wonderful effects achieved in the structuring, differentiation, and growth of the body’s various members. Considered in itself, as a particular natural phenomenon acting in accordance with
the nature with which it is endowed, it may be said to produce its effects by chance, *per accidens*. Viewed differently, however, as part of a universe of nature established by a wise God who has given to everything in nature the capacity to do what is necessary for the realization of ends known to Himself, then natural heat may be said to produce its effects purposively, *per se*, although it can have no knowledge of the ultimate ends for which it acts. Exactly the same reasoning applies in the case of animal behaviour, with the difference that animals may be aware of some immediate goal of their action, while its ultimate aim remains beyond their grasp. The bird, in laying her eggs, responds to the discomfort they cause her when they reach a certain stage of maturation. It could be said that *per se* she lays her eggs in order to rid herself of an uncomfortable burden, an end she recognizes, and only *per accidens* in order to produce offspring, the purpose ordained by God. However, as part of the greater organism that is the universe of nature as a whole, the bird may be said to be fulfilling *per se* the larger purpose of procreation, although she is ignorant of the fact that this is what she is doing when she lays and incubates her eggs. God is ‘the first and universal mover’ (*agens universale et primum*) who acts mediately, through the mechanisms He has established, without the necessity for direct intervention in the natural order. ‘If at some moment God created this universe, as it is devout and proper to believe, then, by the same power and virtue with which He created everything, He also endowed each natural kind with its own capacity to fulfil the purposes demanded by and congruent with that universe. [...] For in nature alone what is possible is also necessary.’

This last sentence is a crisp formulation of what Arthur Lovejoy, in *The Great Chain of Being*, named the principle of plenitude, ‘the thesis that the universe is a *plenum formarum* in which the range of conceivable diversity of *kinds* of living things is exhaustively exemplified’. The other major principle constitutive of the idea of a great chain of being, the principle of continuity, is one to which Fracastoro accords an even more fundamental importance: everything in his universe is bound by it, cosmic order depends on it. If the universe is always continuous and full, he remarks, this is because continuity best serves ‘the primary goal which all things naturally have, to be and to remain in being; for substances and bodies are sustained chiefly and most effectively by their interconnexion and the contact of their extremities: thus they avoid [the creation of] a vacuum, than which nothing can be more inimical to anything in the natural world’. The universe is thus a *plenum* and a *continuum*: a unitary organism of a kind that, as we have seen, justifies considering complex forms of instinctive behaviour as movements of parts within the whole, for the good and for the purposes of the whole; just as peristalsis in the processes of animal digestion.
is a movement of parts within the whole, for the good of the organism as a whole, although the movement may be involuntary and unconscious and its purpose unknown to the part of the organism most intimately involved. As in the case of the action of the species of things, the detailed mechanism of instinctive behaviour may be hidden from us, but it is not occult. On the contrary, such behaviour has a distinctive role in the life of the universe and is to be explained in terms of the principles that govern that life. To seek out these principles is precisely the philosopher’s task. His quest is for natural causal principles of an intermediate kind; intermediate, that is, between the sort of detailed understanding of natural phenomena that may forever elude our human grasp and the appeal to dependency upon the power of God – the most general but least informative of explanations, since it transcends the system of nature altogether. ‘When we are in search, not of the first and universal cause [of some natural phenomenon], but of one that is particular and proper, this cannot be anything immaterial, for thus would nature be destroyed.’

If analogies between the life of the universe and that of living creatures can be advanced with conviction, this is because the universe, for Fracastoro, is itself an animal, a living organism. In the Turrius he is not concerned to define what he means by soul, but when in the Fracastorius he offers a definition, his conception is, like Aristotle’s, an essentially biological one. ‘It seems that all who hear the word soul understand by it a certain principle of life in those bodies that are customarily said to be living.’ Where there is life, there is soul; and life depends on a certain degree of naturally occurring organic complexity. ‘Those bodies are organic which, while consisting of dissimilar parts, are nonetheless constructed with such wonderful harmony, such consummate skill, for the realization of a certain end and the performance of certain functions, that, when they are able to perform those functions, we say that they are living.’ Organic bodies are of three kinds: plants and animals; the heavenly spheres, governed as instruments by their respective intelligences; and the universe as a whole, the connexion, order, and functioning of whose parts excites the most profound admiration. ‘Wherefore almost all our ancestors declared this universe, like some most perfect living being, to be alive, and to be governed and moved by its own soul.’ This world soul, as the principle of life in a universe conceived as a single living organism, is, with respect to natural phenomena, their most general immanent cause, just as God’s creative power is their ultimate transcendent cause. It is the source of the laws which order and govern the universe as a whole, in view of the finalities established for it by the Creator. It is the source too of the energy in virtue of which the souls of individual living creatures perform their vital functions, which are in all respects analogous to those of the anima mundi.
Thus within the microcosm that is man, the most perfect of terrestrial organisms, the life of the material universe is reflected in a wealth of detail that is perhaps especially clear to the eye of the trained physician: the soul confers being and maintains the organism in existence; it governs the attraction of like for like, on which nourishment and growth depend; it enables nutriment to be used to distribute and regulate the elemental qualities, whose balance is so vital to health; it endows the body’s members with movement and feeling; it directs the spirits in their various functions; and is in addition the seat of sensation, perception, and cognition in all its manifestations.82

[259] The principle of continuity so emphasized by Fracastoro is of Aristotelian origin. Like the principle of plenitude, however, the conception of the universe as animate derives, in the Western philosophical tradition, from Plato’s Timaeus.83 While in his choice and distribution of topics in the Turrius and Fracastorius Fracastoro’s treatment of the soul is more reminiscent of Plato’s in the Timaeus than of Aristotle’s in the De anima, in the details of his physics and psychology he is unquestionably Aristotelian. It is chiefly when he attempts to view the phenomena of life in a cosmic perspective, to discover some element of overarching unity in nature, that he has recourse to principles of fundamental importance in the Platonic and Neoplatonic traditions. In conjunction with the concept of universal sympathy, the Timaean, Plotinian, and Ficinian notion of an animate cosmos becomes, for Fracastoro, the most general guiding principle in the endeavour to understand the dynamics of natural phenomena, their structure, coherence, and interrelationships. For if nature is to be considered on its own terms, iuxta propria principia, then it has to be regarded as a systematic whole which behaves in accordance with universal principles of causality and change. Nothing can occur within the system that is not necessitated by the evolving state of the system itself; and nothing can occur within the system without affecting the system as a whole. This reciprocal dependence of phenomena within the universe of nature is conceived on the analogy of the interdependence manifest in the organization and functioning of the living creature. Besides, it is illogical that the universe as a whole should not possess in the fullest measure that life which is characteristic of so many of its parts. Thus the universe is itself an ‘animal’, a richly complex organic whole in which the harmonious relationship of the parts is governed by a soul. Such ideas were to achieve wide currency in consequence of the anti-Aristotelian polemics of Cardano, Telesio, Bruno, and Campanella, as they sought in more or less radical ways to establish natural philosophy on new foundations. In the case of these thinkers, as in that of Fracastoro, the idea that the cosmos is animate has great significance precisely as ‘the first form in which [260] the self-sufficiency of the laws of nature finds expression’.84 Fracastoro
was not anti-Aristotelian; but he was among the first to look keenly and consistently into the book of nature and to draw conclusions unprejudiced by what he had read in the works of Aristotle.

In Fracastoro’s conception of the unity of nature, the postulation of a latens rerum consensus has the effect of smoothing over transitions that were more marked both for his Scholastic predecessors and for his post-Cartesian successors. Since all manifestations of life, all natural reflexes, responses, and activities, have a teleological significance within the organic system of nature as a whole, their precise nature as physiological or psychological, unconscious or conscious, even whether they are merely vegetative or animal or peculiarly human, has less importance than the fact that they can be accounted for by universal laws immanent to the organism of the natural world. The effect of this view on Fracastoro’s psychology of knowledge is, as we have seen, to emphasize the unity and continuity of human experience at the cost of an account of animal and human behaviour that verges on the mechanistic. The Hermetic concept of man the miracle, as promulgated by the exponents of Florentine Neoplatonism, remains of central significance in Fracastoro’s view of the world, and in the Fracastorius he is obliged to tackle the difficult question of the transition, of which the human being is the focus, between the realms of matter and spirit. But the whole thrust of his account of the intellectual faculties in the Turrius is decisively to postpone the problem of the immortal soul until the talk is of supernatural, and no longer of natural realities.

SPENCER PEARCE

[261] 1 The text of this fourth dialogue is to be found in Scritti inediti di Girolamo Fracastoro, edited by Francesco Pellegrini (Verona, 1955), pp. 139-89. In the introduction (pp. 73-138) with which Pellegrini prefaces the text, he suggests (pp. 81, 119-20) that it may have been Fracastoro’s intention to combine the dialogue on the soul and that on grace into a single work.

2 See the opening paragraphs of Pellegrini’s introduction to his transcription of a draft conclusion in manuscript of the unfinished dialogue on the soul: ‘L’inedito del dialogo fracastoriano Fracastorius sive de anima’, in Studi storici veronesi, 1 (1947-1948), 303-23.

3 Hieronymi Fracastorii Veronensis opera omnia (Venice, 1555), ff. 153-64. This volume will be referred to in these notes as Opera, and references will be to folio number and half page (A, B = recto; C, D = verso). In quoting the text of the Opera, I have expanded abbreviated forms and modernized the spelling, but kept the original punctuation, except in a very few instances of obvious error.

4 Opera, ff. 207-24.

5 Opera, ff. 165-206 [=202]. Folios 181, 183, and 185 are incorrectly numbered 185, 187, and 189; thereafter the sequence continues unbroken, but folios 186-202 of the Turrius are in consequence numbered 190-206. References to the wrongly numbered folios of this dialogue
preserve the original foliation, followed in square brackets by an equals sign and the correct number.

6 Giovanni Di Napoli, *L’immortalità dell’anima nel Rinascimento* (Turin, 1963), is the basic survey; Fracastoro’s dialogue on the soul is discussed very briefly on p. 347. For Padua in particular, see Antonino Poppi, *Introduzione all’aristotelismo padovano* (Padua, 1970); and Bruno Nardi, *Saggi sull’aristotelismo padovano dal secolo XV al XVI* (Florence, 1958).

7 ‘si enim per nos ipso absque ullo separato intellectu possimus universale facere, bene erit abstractum illum intellectum labore hoc levare, qui extra nos existens sat foelix se ipso est, et nostras operationes a nobis fieri sinit’ (*Opera*, f. 176A).

8 ‘antiqua illa theologia, quae tum divina, tum prima philosophia vocatur, nobilia quidem ac sempiterna speculatur. verum ex iis paucu sunt, quae cognosci a nobis valeant, tum et de illis tam incerta quoque cognitio est, ut pene fateri possimus aut nullam, aut certe quam minimam ad nos de iis rebus cognitionem pervenisse. at vero quaer natura constant, et nobilia quidem sunt, utpote substantiae et corpora, coelumque atque animalia, tum et certitudinem non parvam habent, et infinita fere sunt, quae scrisse possint: siquidem ubique natura est, quo quo vertamus, quicquid videamus audiamusque: propter quae philosophia, quae de hisce est, inter alias maxima et dignissima censeri debet’ (*Opera*, f. 165B).

9 εἰ μὲν οὖν ἔστι τι τῶν τῆς ψυχῆς ἔργων ἢ παθημάτων ἴδιον, ἐνδέχοιτʼ ἄν αὐτὴν χωρίζεσθαι (*De anima*, 403a10-l 1). See the whole passage, 403a3-16; the point about thinking (μάλιστα δʼ ἐοίκεν ἱδίῳ τὸ νοεῖν) is made in line 8.

10 ‘sed quaenam erit illa animae operatio, in qua non communicet corpus? illa [...] vita spiritus, per quam homo renasci, et novus fieri dicitur, quasi corporeum omne exuerit, ac totus spiritu quasi Deus, vivat. [...] siquidem eiusmod vitae, qua vita spiritus dicitur, finis est [262] Dei maxim fruitio. illa etiam fieri perfecta non potest, nisi ipso mediante et coadiuvante’ (*Opera*, ff. 215D, 221A). Fracastoro also suggests (f. 221A) that the soul in its absolute state, in which it may exist independently of the body, enjoys a much more perfect kind of intellection. He does not elaborate, but doubtless what he has in mind is the direct intuition characteristic of angelic intellect, as distinct from earthly human reasoning, with its dependence on sense and imagination. Pomponazzi makes the point succinctly thus: ‘intellectus enim simplici intuitu omnia intuetur; at ratiocinatio compositione, discursu et cum tempore’: see *De immortalitate animae*, edited by Giovanni Gentile (Messina and Rome, 1925), p. 75.

11 ‘nos eas intellectus operationes impraesentiarum sumus prosecuti, quas exercet in composito corpore, toti communes’ (*Opera*, f. 205B [=201B]).


14 For Pelacani, see *The Cambridge History of Renaissance Philosophy*, general editor Charles Schmitt (Cambridge, 1988), pp. 486-88; and Poppi (note 6 above), p. 22, who summarizes thus:
'nella sua figura si intravedono quindi già fortemente delineate le direttive della futura evoluzione della “scuola padovana”: il prevalente interesse scientifico, una soluzione naturalistica dei problemi metafisici, la piena autonomia della ragione rivendicata mediante la più completa amortizzazione delle affermazioni della fede.'

15 ‘per intellectonem intelli[imus] cognitionem omnem, quae post sensus ab anima introrsum fit’ (Opera, f. 165D).

16 Opera, f. 166A.

17 ἡ μὲν αἴσθησίς ἐστὶ τὸ δεκτικὸν τῶν αἴσθητων εἰδῶν ἄνευ τῆς ύλης, οἷον ὁ κηρὸς τοῦ δακτυλίου ἄνευ τοῦ σιδήρου καὶ τοῦ χρυσοῦ δέχεται τὸ σήμεον (De anima, 424a17-20).


19 ‘verum enimvero de natura specierum multa fortasse oporteret deterrinare, quod et alterius temporis et negotii est. nunc tantum sufficiat de iis dicere, quod a rebus momento effluunt, et diffunduntur in orbem, quacunque medium, per quod transeunt, est susceptivum earum. tale autem medium videtur esse perspicuum et transparens corpus, quod diaphanum vocant: per densa enim et opaca non transeunt. item et naturam earum esse ea animae repraesentare et offerre, quorum sunt species’ (Opera, f. 166A-B).

20 In De sympathia et antipathia rerum (Opera, ff. 79-104) there are references at folios 100B and 103B to what the writer has written elsewhere on the subject of intellecton, but the second of these references states that the work on intellecton is not yet quite ready for publication (‘nondum autem emissa, neque plane exculta, et digesta’). Fracastoro appears constantly to have worked with what he had written and what he intended to write in mind: hence the general consistency and interdependence of his scientific and philosophical writings.

21 ‘nihil natura sustinet, nihil ad mittit, quod frustra sit, quodque universi ordinem et leges impediat’ (Opera, f. 79C-D), echoing Aristotle, Physica, 252a11-12; De caelo, 271a33. On the functions of harmony and of species in the physical universe, and on De sympathia in general, see the excellent article by Enrico Peruzzi, ‘Antioccultismo e filosofia naturale nel De sympathia et antipathia rerum di Gerolamo Fracastoro’, in Atti e memorie dell’Accademia Toscana di Scienze e Lettere La Colombaria, 45 (1980), 41-131.

22 Opera, f. 206A [=202A].

23 See in particular De contagione (Opera, ff. 105-51), Book I, Chapter 6, the title of which could not be more explicit: ‘quod causa contagionum quae ad distans fiunt reducenda non sit ad proprietates occultas’. Peruzzi (note 21 above), p. 47, comments: ‘è nel consenso universale, nelle reciproche connessioni del tutto, che ciò che è nascosto trova una sua spiegazione di fondo; ogni fenomeno risponde al ritmo armonico del tutto e, come tale, è perfettamente naturale’.

24 ‘quoniam igitur nulla actio fieri potest nisi per contactum (ut in naturalibus demonstratur) similia autem haec non sese tangunt, nec per naturam moventur unum ad aliud, necesse est, si aplicari invicem debent, dimitti aliquid ab uno ad aliud, quod proxime tangat, et eius applicationis principium sit’ (Opera, f. 82B-C); see Aristotle, De generatione et corruptione, 322b2-1-25.

25 ‘ingenitum autem est formis omnibus sese (quo magis possunt) propagare, quod quidem faciunt crassae illae formae, quae materiales vocantur, verum propagare sese per eum modum, et existentiam, qua ipsae sunt, non utique possunt, sed tenuem, et superficialem sui vel partem, vel gradum producunt, quem epipolim vocant, qui ob tenuitatem sui et contrarium non habet, et momento gignitur, ac propagatur’ (Opera, f. 83A). Epipolim is evidently meant to be the accusative of ἐπιπολή, but I am unable to identify who ‘they’ are who use the word in the technical sense claimed for it here. The concept is Atomist, and in
Fracastoro’s principal source of Atomist doctrine, Lucretius, the corresponding word is *simulacra*, the term Fracastoro himself prefers, although he bows to convention in using the more familiar *species*. *Simulacra* renders the standard Epicurean term εἴδωλα. In the writings of Epicurus, as far as I am aware, the word ἐπιπολή occurs only once, in the *Letter to Herodotus*, I, 48, 3, where it appears in conjunction with εἴδωλα, but with its own meaning of ‘surface’; ἡ γένεσις τῶν εἴδωλων ἀμα γοίματι [264] συμβαίνει· καὶ γὰρ ῥέψις ἀπὸ τῶν σωμάτων τοῦ ἔπιπολῆς συνεχῆς. See Epicurus, *Opere*, edited by Graziano Arrighetti (Turin, 1960), p. 45. The whole question of Fracastoro’s ‘atomism’ merits investigation.

26 In the perceptual realm, for example, the *species* of black may coexist with that of white, hot with cold, sweet with bitter, etc., without absorption or confusion: see *Opera*, f. 166B.

27 ‘recipiendum autem est (ut multis placet) spirituales species eiusdem rationis esse cum formis illis, quarum sunt species, nec differre ab iis nisi modo subsistendi’ (*Opera*, f. 83A).

28 ὁ δὲ τρόπος τῆς πληρώσεως ἀποχωρήσεως τε γίγνεται καθάπερ ἐν τῷ παντὶ παντὸς ἢ φορά γέγονεν, ἦν τὸ συγγενές πάντας ἐφερᾶτο πρὸς ἐαυτῷ (81a2-4). Timaeus is employing the analogy between macrocosm and microcosm in order to explain the processes of growth, wasting, and replenishment within the living organism, an analogy of which Fracastoro himself makes use in his discussions of organic processes.

29 ‘in quo toto partes non plane debitum esse, et situm habent, nisi invicem ita astringantur, ut simul et a, et b coeant’ (*Opera*, f. 83B).

30 In the case of the sense of touch, the body may in the first instance be affected by the *material* form of an object, giving rise to sensations of heat, cold, etc.; however, it is only the spiritual form, the *species*, that is conveyed to the brain and has any part in intellection: see *Opera*, f. 167A.

31 ‘intellectio [...] non aliud certe videtur esse, quam praepresentatio objecti, quae animae interiori fit per receptam objecti speciem’ (*Opera*, f. 166B).

32 ‘existimandum autem est ferri ipsas [species] per vocatos spiritus, qui de natura aeris sunt, quique per arterias et nervos diffusi sunt ac pene continuo, eue nubes quaedam’ (*Opera*, f. 167A; see also f. 209A). Arterial and cerebral spirits are Galen’s πνεῦμα ζωτικόν (the *spiritus vitalis* of medieval physiology) and πνεῦμα ψυχικόν (spiritus animalis) respectively; see Rudolph Siegel, *Galen’s System of Physiology and Medicine* (Basle and New York, 1968), pp. 183-95.

33 See *Opera*, f. 197B-D [=193B-D].

34 *Opera*, f. 167B-C; see Aristotle, *De anima*, 429a27-29; and, for the notion of ‘proper place’, *De caelo*, 300a20-b8; 310a20-b2.

35 This emphasis is a tendency present in the work of other Italian philosophers of nature, notably Telesio and Campanella: see Ernst Cassirer, *Das Erkenntnisproblem in der Philosophie und Wissenschaft der neueren Zeit*, second edition (Berlin, 1911), Vol. 1, pp. 225-57. Cassirer remarks (p. 226) that for these thinkers ‘die Einheit des Wissens ist nur durch seine völlige Reduktion auf den Einzelgegenstand, den die Empfindung uns vermittelt, zu gewinnen und aufrecht zu erhalten’; and he considers this general development in the psychology of knowledge to be already clearly emphasized in Fracastoro’s *Turrius*.

[265] 36 ‘non est igitur necessarium in intelligendo animam quicquid agere: statim enim ubi receptit speciem, praepresentatio illa fit objecti, quando et ipsa apta est, cui praepresentetur, et natura speciei est ea praepresentare, quorum est species et imago’ (*Opera*, f. 166C-D).

37 [sensus communis] apprehendit autem haec sensibilia eo pacto eisdem conditionibus, quibus illa in sensibus primo fuere [...]. nam quoniam species nata est et rem et rei modos offerre, hinc fit, ut cum oculus exempli gratia attigit coloris speciem, simul etiam et conjuncta cum colore recipiat, qui modi dicuntur: haec autem sunt numeros, quantitas, figura, locus,
situs, motus, actiones, distantiae, similitudines, et aliae relationes, et alia, quibus res consistunt’ (Opera, f. 168A).

38 ‘voce autem subnotionem nunc eam cognitionem, qua sub uno quodam apprehenso multa alia simul confuso quodam ordine sese offerunt; ad quae consequenter movetur anima, unum post alium ceu inspectura. constat enim in animali esse motum hunc, qui non est compositio, aut ratiocinatio, in qua veritas, aut falsitas sit, sed simplex, et sola representatio unius sensibilis post alium’ (Opera, f. 169D).


40 ‘fit igitur operatio haec et motus ab anima inferiori [=interiori?] statim sensibilibus oblatis, interdum quidem sensu adhuc actu existente, interdum post. [...] illud tamen non nesciendum est interdum, dum memoramur, offerri quaedam uti confusa, et per umbram, ad quae distincte cognoscenda movetur anima, qui motus non proprie memoria, sed subnotio est’ (Opera, ff. 169D-170A, 172B-C).

41 The term subnotio is a transparent coinage derived from the verb subnotare, a principal meaning of which is to ‘mark particularly’, ‘take a special note of’ a thing, either mentally or in writing; see The Oxford Latin Dictionary, edited by Peter Glare (Oxford, 1982), subnoto, under 2.

42 ‘ad faciendam intellectennon non sufficit praesentia specierum, sed requiritur et applicatio animae, et intentio: propter quod saepe nec illa, quae prae oculis sunt, videmus, quod intentionem non adhibemus. [...] quod movere se animam dicimus, nihil aliud est, quam applicari ipsam atque intendi ad unum aliquid’ (Opera, f. 170B-C).

43 ‘spiritus quippe multi uniantur, nervi et membranae tenduntur, unde et intentio dicta est, ac tandem virtus omnis, ac vis animae ad unum quoddam applicita, et intenta est’ (Opera, f. 170C).

44 See Opera, ff. 170D-171C.


46 ‘In memoria, reintelllectio quaedam fit eius, quod prius etiam intellexeramus. fit autem reintelllectio haec, occasione cuiusdam, quod alias observavimus cum eo conjunctum, quod reintelligitur, comparavimusque inter se, ut conjuncta’ (Opera, f. 172A). Recollection is dealt with at folio 172C.

47 ‘de qua siquid ab Aristotele traditum est, videtur quidem communi phantasiae nomine comprehendisse. multas enim operationes habet facultas illa, quae ab ipso phantasia appellatur, inter quas prima illa videtur, quam nunc subnotionem voco’ (Opera, f. 169D). The terms phantasia and imaginatio are sometimes used interchangeably (St Thomas, for example, makes no distinction between the two: see Summa theologiae, 1, 78, 4), but generally imaginatio is the image-receiving or image-forming faculty, phantasia the constructive imagination: Dante’s virtù imaginativa (Purgatorio XVII, 13) and alta fantasia (Paradiso XXXIII, 142) respectively. Given the broad range of duties he assigns to phantasia, Fracastoro was obliged to use imaginatio in the more specialized sense of ‘creative imagination’.

in *Aristotle on Mind and the Senses*, edited by Geoffrey Lloyd and Gwilym Owen (Cambridge, 1978), pp. 99-129. Earlier readers of the *Turrius* have detected in the concept of subnotion an intimation of the role in perceptual recognition accorded to the imagination by Immanuel Kant; see Giuseppe Rossi, *Girolamo Fracastoro in relazione all'aristotelismo e alle scienze nel Rinascimento* (Pisa, 1893), pp. 199-200; and Giuseppe Saitta, *Il pensiero italiano nell'Umanesimo e nel Rinascimento*, 3 vols (Bologna, 1949-1951), Vol. II (1950), p. 190. In the first edition of his *Kritik der reinen Vernunft* (Riga, 1781), pp. 95-130, Kant is concerned with the role of imagination in the synthesis of sense impressions in a way which suggests (albeit in a wholly different philosophical language) the operations of Fracastoro's common sense and subnotion combined. Given that Fracastoro, if I have understood him correctly, regards subnotion as attention to striking or relevant elements in the 'synopsis' provided by the common sense, and that usually the two faculties operate simultaneously, the parallel with Kant is not unjustified.

49 See Opera, f. 176D.

50 See Opera, f. 175A, complemented by what Fracastoro has to say on the subject in the *De contagione* (Opera, f. 107C-D).

51 See *Summa theologiae*, 1, 79, 3 and 4.

52 'si igitur intellectus ille [extrinsecus] novam quandam speciem efficit, quae universale referat, monstum profecto audire mihi videor, separatam sicliet substantiam species facere: quando objecta sunt, quae species faciunt utpote imagines suae' (Opera, f. 176B). See Averroes, *Commentarium magnum in Aristotelis de anima libros*, edited by F. Stuart Crawford (Cambridge, Massachusetts, 1953), commentary on Book III, text 5 (429a21-24), especially pp. 406-12. For Averroes the receptive intellect is distinct in precisely the same way as the agent intellect.

53 See Opera, f. 176B-C.

54 'hoc ergo pacto fieri universale censendum est, si et ipsum etiam experientiam consulamus' (Opera, f. 177C).

55 'iwm enim manifestum est unam esse et eandem speciem in utroque, sed modis diversis. in sensu enim est confusa et conjuncta cum aliis conjunctis, in intellectu vero separata, et distincta, ac sic universalis facta. dico autem esse factam universalem non secundum esse, quod habet, quatenus una quaedam qualitas est, sic enim singularis est, sed universalem, quatenus imago est, et repraesentat' (Opera, f. 177C).

56 As Cassirer (note 35 above) has pointed out (Vol. I, p. 230); see George Berkeley, *A Treatise Concerning the Principles of Human Knowledge*, second edition (Dublin, 1734), introduction, especially sections 7-12. Berkeley expresses himself at several points in terms very similar to those employed by Fracastoro, concluding (section 12) that 'an idea, which considered in itself is particular, becomes general, by being made to represent or stand for all other particular ideas of the same sort'.

57 'potentia haec animae, quae ideis est plena, divina quodammodo est, et solus hic intellectus appellatur' (Opera, f. 177B-C).

58 'natura videtur semper a minus perfectis procedere ad perfectiora per certos gradus' (Opera, f. 170D; see also ff. 178D, 204B [=200B], and elsewhere).

59 'ita enim instituisse natura videtur, ut, quaecunque facultates in aliis inveniuntur animalibus, omnes in homine reperiantur' (Opera, f. 204B [=200B]).


61 *Opera*, ff. 179C-185C [=181C]. Example (Aristotle's 'rhetorical induction') and enthymeme (Aristotle's 'rhetorical syllogism') are rhetorical modes of reasoning, induction and syllogism are dialectical: see Aristotle, *Analytica posteriora*, 71a1-l0; *Rhetorica*, 1356a43-b21. On the important matter of Fracastoro's logic of induction, see Paolo Rossi, *Il metodo induttivo e la

62 'censendum est quaedam horum [ratiocinandi modorum] a phantasia fieri, ut exempla, et enthymemata quaedam, quasdam etiam inductiones eorum, quae faciles sunt, et in quibus singularia sunt paуча, et terminata: syllogismos vero, et inductiones alias solum intellectum facere. quare et a solo homine haec fieri putandum est. reliqua vero nihil prohibit et ab aliis animalibus fieri, quae phantasiam habent' (Opera, f. 185C [=181C]).

63 Opera, f. 179A.

64 'fortasse autem et alia animalia exemplis moventur. aves enim cum vident aliquas alias visco captas, viscum evitant, simile sibi futurum existimantes' (Opera, f. 179D).

65 'necessarium est ergo animali quod percipiat hujusmodi intentiones, quas non percipit sensus exterior; et hujus perceptionis oportet esse aliquod aliud principium [...]. sic ergo ad receptionem formarum sensibilium ordinatur sensus proprius et communis [...] ad apprehendendum autem intentiones quae per sensum non accipiuntur ordinatur vis aestimativa' (Summa theologiae, 1, 78, 4).

66 'supponendum igitur est, ut supra diximus, species repraesentare res, et modos, seu conjuncta cum rebus, inter modos autem rerum maxime intrinseci, et praecipui sunt convenientia et disconvenientia oblatorum cum anima. omnis enim species recipitur ab anima, vel ut conveniens, et bona, et grata, vel ut disconveniens, et mala, atque ingrata. quod igitur fit, quia, quemadmodum res inter se vel convenientiam habent, vel disconvenientiam, ita et earum species, quae illas repraesentant' (Opera, f. 184C).

67 See Opera, f. 189A [=185A].

68 ὁρμή μεταβολῆς ἐμφύτου (Physica, 192b18-19).

70 'motus ergo omnes, quos anima tam mirando, facit, omnes reducuntur ad motum partium in toto' (Opera, f. 189C [=185C]). For Chapter 4 of De sympathia, see Opera, f. 81A-C.

72 'animas vero et ipsa modo condensat, modo rarefacit, et habet motum partium in toto, sed non semper ad unum habet, sed ad diversa, prout diversa specie est informata. habet autem et motum sursum, aut deorsum, et rarefactionem, et condensationem, ad unum determinata: sed hoc in quantum includit facultates naturae simplicis per formas elementorum in ipsa. verum praeter has, in quantum cognoscit, et informatur speciebus, habet et motum partium in toto naturaliter insitum, per quem situantur modo uno pacto, modo alicui, ut melius est sub hac, et illa specie. et haec forte est illud, quod quidam instinctum vocant' (Opera, f. 189B [=185B]).

73 Opera, ff. 96A-97A. The remark concerning phantasia appears at folio 96B: 'videtur enim ea facultas quasi toti deputata, uti ministra et cognitrix eorum, quae ad totum pertinent'. Fracastoro's view of animal motion is clearly indebted to Aristotle: see De motu animalium, especially 700b18-29; 701b34-702a21; 703a5-b26; and De partibus animalium, 665a10-15.

74 'si quandoque universum hoc est a Deo factum, ut pium est et aequum credere, eadem virtute, et potentia, qua fecit omnia, facultatem etiam propriam dedit naturis singulis, qua pervenire possent ad fines illi universo debitos, et congruentes. [...] in sola autem natura,
quod possible est, necessarium etiam est’ (Opera, f. 191B [=187B]). Fracastoro’s treatment of instinct in the Turrius occupies folios 184C-192A [=188A].


[269] 76 rectius igitur fortasse illud dicetur primum finem, quem omnia per naturam habent, esse, ut sint, ac conserventur: conservantur autem substantiae et corpora principaliter ac maxime per mutuum nexus, et contactum extremorum: sic enim evitant vacuum, quo nihil esse potest inimicum magis omni naturae’ (Opera, ff. 79D-80A).

77 See Opera, f. 97C.

78 ‘neque enim dicendum (ut quidam aiunt) universi partes, tametsi non eum cognoscent finem, dirigi tamen a cognoscente: quando hic non universalem et primam causam quaerimus, sed particularum et propriae: quale esse non potest eorum ulla, quae immaterialia sunt, sic enim perisset natura’ (Opera, f. 79D); see also the letter of dedication of De sympathia to Cardinal Alessandro Famese, Opera, f. 78B.

79 ‘videntur autem, quicunque audiunt nomen animae, principium quoddam vitae intelligere in his corporibus, quae vivere dici solent’ (Opera, f. 208A); see Aristotle, De anima, 412b4-6; and Richard Sorabji, ‘Body and Soul in Aristotle’, in Philosophy, 49 (1974), 63-89, which also has general relevance to the discussion of instinct in the previous section.

80 ‘sunt autem organica corpora, quae, cum dissimilaribus constent partibus, tanto tamen et tam miro consensu, atque artificio constituta sunt pro certo fine, et operationibus obieundis, ut vivere illa dicamus, cum obire illas possunt operationes [...]. quae et hoc universum, tanquam animal quoddam perfectissimum, vivere, et anima sua regi, atque agitari maiores nostri omnes fere dixere’ (Opera, f. 208A-B).

81 Thus Francesco Pellegrini, Fracastoro (Trieste, 1948), p. 92: ‘quella “mens”, quell’“anima mundi”, a cui più volte accenna nei suoi lavori filosofici, si identificavano per il Nostro col principio di energia finalisticamente inteso, che coesiste colla materia anche nel regno delle sfere celesti, da Lui collocate fra i corpi organici; corrisponderebbe in complesso a quella direttiva per cui devesi supporre necessariamente che il tutto e le parti varie dell’universo siano pervasi da una finalità immanente’.

82 See Opera, f. 209B.

83 See Aristotle, Historia animalium, 588b4-6; De partibus animalium, 681a12-14; Metaphysica, 1075a11-25; Plato, Timaeus, 41b6-d3; 30b6-c1.

84 ‘Der Begriff des Weltorganismus [...] ist die erste Form, in die der Gedanke der Selbstgenügsamkeit der Naturgesetze sich kleidet’ (Cassirer (note 35 above), Vol. I, p. 208).

85 It is significant that Fracastoro devotes relatively little space in the Turrius to the subject of the will: see Opera, ff. 182A-187D [=183D]. The will constitutes with the intellect a single faculty and is distinct only in that it apprehends objects not simply as existent, but also as goods by which the soul is moved. In the acquisition of those habits of will we call virtues, Fracastoro stresses the role of bodily dispositions and temperament, and the importance of socialization and maturity as modifiers of impulsive behaviour. The life of secure virtue he regards as dependent on God’s grace.

86 See Opera, ff. 221C-222A, where recourse is had once more to the notion that there are at work in the universe two general principles which govern things (1) as particular natures subject to natural processes; and (2) as parts of a universal nature whose operations are directed in conformity with the goals laid down for it by God. In the case of the intellecutive soul, the naturally occurring material conditions for its induction do not per se ‘intend’ an immaterial form, but, as parts of a divinely ordained whole and in accordance with God’s will for mankind, they are assigned a form of a superior genus, generated not by matter but by God Himself.