How big? How fast? Transcendental Reflections on Space, Time and World Models

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Abstract
Of what does the size of spatially and temporally extended phenomena consist? The particular, non-conceptual magnitude of a spatial thing is a determinate, world-defining unit size. Correspondingly, natural objects have a definite size in relation to embodied human subjectivity as a global 'measure of worlds'. As displayed by the occurrence of global models in human life, this relation has an irreducibly indexical character. The particular temporal extension of events is intrinsic to human experience as well – albeit in a different way. As displayed in local models only, it is a conceivable object of practical but not of propositional knowledge. In its role as a global spatial measure, somehow the human body is more than one among the many possible objects of descriptive knowledge. This role is supplied by rational agency – which is then a condition of the world.

In transcendental idealism, space and time are held to be nothing but forms of human experience. Accordingly, without the existence, somewhere in the universe, of human beings, there would be no space and time.[1] I want to sketch a defence of this view, taking as my point of departure the simple fact that spatial things and temporal happenings have a definite size. In other words, questions such as: 'How big is it?' and 'How long did it take?' make perfectly good sense and have a clear answer.

Moreover, what I have in mind is not mathematical size, but the size of extended items in space and time. For such items, a distinction between *conceptual* and *particular* size is taken for granted. As a case of conceptual size, consider units of *narrative* time: 'Then, two years passed'. Such 'years' may be conceived of independently of the real,

[1] In talking about 'human experience' and 'human beings', what I have in mind is the transcendental view on space and time as forms of experience instantiated in the human species but not necessarily limited to us. A clearly formulated modern version of this view is found in the works of Anton Friedrich Koch, cf. his *Subjektivität in Raum und Zeit* (Frankfurt am Main: Vittorio Klostermann, 1990); 'Wozu noch Erste Philosophie?', *Zeitschrift für philosophische Forschung* **48** (1994), 497–517.

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particular duration of a year. Or take the spatial case of maps and other *models* of alternative worlds with everything shrunk or blown up in the same proportion. Conceptually, there is no difference between the size of a paper 'metre' in a model and a metre in the real world, *our* world. Still, only the latter has the particular length of a *metre* – an *indexical* fact known to anyone who uses maps ('*This* length corresponds to *that* piece of ink on the map').[2]

Accepting the distinction between conceptual and particular size, I will argue in defence of the following transcendental claim: *Extended items of space and time have no determinate, particular size in a world without human beings*. This conclusion is reached by way of two subclaims: (1) Only in relation to an embodied epistemic subject is the particular size of a spatial unit an object of possible propositional knowledge; and (2) The particular size of a temporally extended unit cannot be an object of propositional knowledge, only of embodied, practical knowledge. In both cases, the only *conceivable* knowledge is indexical.[3]

Reflections on spatial size make up the first and major part of this work (I). I then take a closer look at temporal extension (II). Finally, I outline a view of human agents as the measure of things (III).

I

In talking about spatially extended objects, should one consider their size a relation or an intrinsic property?

Within today's philosophy of science, an Aristotelian notion of size as somehow inherent in things is considered naively objectivistic.[4] But doesn't it at least capture the normal conception of size in daily

[2] As far as I can see, this distinction between particular and conceptual size is taken for granted in theories of space and time as constituting the unique system of singular reference and individuation of empirical things and events, cf. Peter F. Strawson, *Individuals* (London: Methuen, 1959). Ernst Tugendhat, *Vorlesungen zur Einführung in die sprachanalytische Philosophie* (Frankfurt am Main: Suhrkamp, 1976). Gareth Evans, *The Varieties of Reference* (Oxford: Clarendon Press, 1982). Without a notion of particular, non-conceptual size, no individuating localization can be based on the objective, particular distance between items of space and time.

[3] In which case, strictly speaking, there is no 'objective' localization in space. This view is the exact opposite of Gareth Evans' opinion that localization in objective space is 'from no point of view' (Evans, ibid. 152).

[4] Cf. Brian Ellis, *Basic Concepts of Measurement* (Cambridge: University Press, 1966), 24ff.

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life? It hardly does. It is true that I know the size of a particular tree when I see it. But without some amount of background knowledge, isolated sensations do not yield knowledge of size. Knowing the size of a tree by seeing, I necessarily also understand a lot about its relationship to the environment, myself included, much of which may be summed up by the concept of *perspective*. Lacking perspectival background knowledge, I cannot, for instance, tell the size of distant objects on a foggy sea or of UFO-like phenomena in the night sky. The more I know of specific spatial relations, the better I am able to tell the size of empirical objects with some precision.

Then perhaps instead we should think of spatial size the way physicists do, as a *relation*? From a mathematical point of view, any quantity may indeed be treated as sets of numerical relationships, with one metre being one hundred times as long as a centimetre or a thousandth of a kilometre. But what about the real, physical size of objects? Mathematical descriptions of multiples or parts of metres, pounds and calories as well as their relations are identical, but that surely does not obliterate the qualitative distinctions between them . . . or? – To which the relationist has a ready answer:

Qualities are qualities and quantities are quantities. A metre will never be a pound, but knowing that yields no knowledge of the size of either. And normally, we do not talk about 'knowing' a unit size at all. On the contrary, since units are presupposed by quantification, ascribing to them a determinate quantity makes as little sense as determining the size of the number 'one' as a precondition of counting. In attempting such determinations, one cannot but end up like Wittgenstein, who ironically presents a person who places his hand on his head and states, 'This is how big I am'.[5] There may be a certain reality to such a gesture, but it makes no contribution to real, propositional knowledge. *As an object of propositional knowledge*, the size of spatial units seems to be relational after all, either analytical (as in 1 m = 100 cm) or empirical (That tree is twice the size of that other one).

This does not reduce spatial size to mathematical notions, but the remainder is just a question of qualities. And then perhaps we should leave it at that, i.e. roughly from the standpoint of physics. We have sensations of objects and we may know their relations, and that is all we need – most fortunately so, since asking for more seems to be asking for the impossible: A different unit size determines a different, relationally equivalent *world*, and so knowing this difference

[5] Ludwig Wittgenstein, *Philosophische Untersuchungen* (Frankfurt am Main: Suhrkamp, 1971), 152 (§279).

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would amount to knowing no less than the difference between worlds. Presumably, no one in his or her right mind would undertake the endeavour of acquiring empirical knowledge about this? We may perhaps think about an exactly similar world that is double the size of our factual one. But that is simply a thought, isn't it, with no relevance to knowledge of empirical size?

But in view of my introductory distinctions, it seems we now face a dilemma. Relationally, we may know an accurate representation of a set of 'metres' on a blackboard without knowing the real, particular distance represented. The scale of representation indexically determines a world, however, as in 'the item represented by those marks of chalk is *that* big'. So somehow the distinction between conceptual and particular size is global. Therefore, the indexical 'knowledge' involved seems to be just a subjective experience of a unit size. This gives us the following, rather strange result: while any propositional knowledge of spatial size is conceptual and relational, any particular knowledge of such size is subjective or non-propositional. How then can anyone reasonably be said to know the spatially extended size of empirical objects?

I now propose an answer to this dilemma: There is indeed a clear sense in which we, as embodied human beings, propositionally know the size of the empirical world. The ability required for such knowledge is displayed by our mastery of what I term 'global models'.

Models of the empirical world are omnipresent: maps, diagrams, pictures, toys, figures, architect models, among others. Some of these models are designed to illustrate non-standard sizes of normal empirical phenomena. Just as a fictitious person may shrink to a couple of cm in a novel, I may use a matchbox to illustrate what happens in the story: Look, that's how small he got! Because they seem so odd compared to their surrounding environment, cases like these may be quite funny when shown in a movie. Such models do not represent relationally equivalent worlds, which is why I call them *local* models. There is something perceptually strange in deviant local models, which makes them look abnormal.

Global models, however, which are certainly much more common, are relationally identical with the real world. Maps, paintings or *Lego* figures may be rather inaccurate presentations of many properties of empirical objects. But to the extent that the relations of size among the items are the same, the models are *perceptually similar* to the real world and do not look odd in any way. Small *Lego* houses are inhabited by small people. There is the question of scale, as defined by a simple number (e.g. 1:1000). But be it in fantasy or in real

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stories – to any kid who plays with them, the models are easily perceived and understood as scenarios of normal 'worlds'.

Or take a map. It presents empirical objects of the world as tiny, small marks of ink on paper. No one who has ever used or understood the function of a map would say 'How could a lake be that small, what kind of beings could possibly swim in it?' or, given another map of a neighbouring region, 'You mean this area is also that small?!' Again, maps retain all size relationships between things. That means the only difference in magnitude between the marks of ink on a map and the reality they represent is a difference of unit size. So a map is a way of looking at the whole world.

We may even put ourselves into any such model: 'There, on the photo to the left, you see me', or 'That figure is you, Michael, and that one is me'. As such, the alternative worlds represented by global models do not display alternative relations between objects and empirical epistemic subjects either. And I do find the ability to 'play' with the world, including oneself, a striking feature of human beings, not to be found among animals or disembodied gods. Now I also believe the existence of global models shows how the particular size of empirical things may be the object of propositional knowledge.

Consider a photo of your car. You put the photo on the street beside the car and compare their sizes. You find the relation between the paper car and the real car to be, say, 1:100, and so you are in possession of propositional knowledge about a simple, completely normal empirical fact: The model's size is $1/100^{th}$ of the reality represented. Suppose you also know the size of the paper car to be $1/50^{th}$ the size of your own body. Then due to the special *status* of the physical elements of a global model, there is a clear sense in which you propositionally know the size of an artificial *world*. And knowing the scale as well, of course you also propositionally know the global size of the real car in the real world. It is double your own size.

This is not a question of analytically thinking up alternative sizes of worlds, but of knowing, as based on observation, which one among the many possible word-defining unit sizes is the real one. As users of global models, it seems that we know this. But then the next question is: What is it about human beings that accounts for this astonishing mastery of global models? I believe it is based on *practical, indexical* knowledge. Dealing with the latter, indexical point first, I will argue for it by way of a contrastive thought experiment.

Paul grows up in a plane that encircles the Earth year after year. His only encounter with other humans has been with his family on board the plane. However, thanks to his computer, his knowledge about the world is very rich. Through films, photos, scientific courses and other

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internet resources, he knows more about the empirical world than most of us do. Let us imagine he knows virtually everything – except, for some strange accident, facts about human beings whom he recognizes as similar to himself. He knows everything there is to be known about the relational size of things, through items displayed on his computer. (So he even knows the relative size of 'humans', he just does not know that he is one of them.)

In other words, he knows everything there is to be known about size in a global model of the world. But of course he does not know the real, particular size of real things of the real world. So, what is he lacking? Direct sensation of empirical objects and events, not just of their model representations, perhaps? But now consider his sister Mary.

Mary also grows up on the plane. But instead of spending her time with a computer, day after day she lies on the plane's glass floor, studying the empirical world down on the Earth. Her eyes are extremely sharp, and not even the tiniest empirical detail escapes her attention. Strangely, she suffers from the same cognitive limitation as her brother, in never recognizing a living being observed from above as one of her kind. And there is one more thing she does not know: the altitude of the plane, i.e. her own distance from the objects observed. Then, in spite of her rich observations, I think it is pretty clear that she knows no more about the real size of things than her brother. In finding the correct scale among the many possible scales for his global computer models, she is no help at all.

Thus the thought experiment lends intuitive support to the very distinction between conceptual and particular size. In this respect, it also illustrates the fact that science, as sets of relationships between physical observations, draws no distinction between different worlds as determined by different particular unit sizes.[6] We might even conceive of a scientifically *omniscient being*, who knew all physical sensations and relations of the universe. This omniscient being, defined as an ensemble of such knowledge, could no more tell an empirical object's particular size from its conceptual size than Mary could. So what do we ordinary human beings know that Paul, Mary and the scientifically defined omniscient being do not know? We know our own *indexical* perspective on the world.

[6] So this is not about physical scale invariance. Normal cases of scale variance in contemporary physics are easily mirrored in relationally equivalent models of any size whatever. Therefore, the epistemic or transcendental importance of global models is neutral on the issue of physical scale invariance.

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Mary knows about perspectives, too. From textbooks, she learned about the geometry of perspective, and she observes a vast variety of perceptual perspectives among animals. But there is one important thing she does not know. Since she cannot place herself among all her mundane observations, she does not know *her own* perspective on the outside world. Perhaps, due to her unusually sharp eyes, she even catches a glimpse of her own shadow in a lake far, far below. Still, she does not recognize the indexical relationship of other things to herself *as herself*, which means she is as ignorant about their size as she was before she saw her shadow. On the other hand, once she has that kind of recognition, she knows the true sizes of things. She can then truly say: Among the many possible worlds based on my observations, *that* is the *real* one; it supplies the true, particular unit size.

In other words, the knowledge of global models is indexical – a way of knowing not only open to gods. On the contrary, it is open to human beings and not to gods. Or consider once again the omniscient epistemic subject. We probably would have to imagine her as a disembodied being, simultaneously 'reaching out' to all the observations there are. As a disembodied being, she could not compare spatially extended objects with herself – and then she could not possibly know what embodied human beings know. So it seems we know more than an omniscient spirit.[7]

Now, how can such knowledge be more than a subjective experience, much like Wittgenstein's man with his hand on his head? We have not yet solved the problem of how propositional knowledge can be more than relational – say between the car and a piece of paper or other objects *within* the empirical world. Propositional knowledge of unit size seems to presuppose a standpoint *outside* the world from which to evaluate different worlds as displayed in global models. Our practice of using such models does not yet explain how that very practice is possible. I will now sketch a two step-answer to that question: (1) It is possible only if there is a physical measure of the world 'outside' the physical world; and (2) As humans, we do in fact constitute such a measure.

[7] From her 'view from nowhere', the omniscient being knows everything about physics. But as embodied human beings, only we know distinctions of spatial size that do not supervene on perceptual distinctions of physics. Neither do they supervene on distinctions between parts of homogeneous, Newtonian space. Just like scale variance, any such distinction is mirrored in global models of the world – leaving the true correlation of one set of perceptions with one particular unit of space entirely open.

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(1) No disembodied god can be a physical measure, so she has no empirical standard of comparison for her observations. And without a global measure, there can be no propositional knowledge of global size. She may think up worlds of different sizes, but she knows no real difference between them. On the other hand, how could one blame anyone for not knowing that? Does asking for an empirical measure of worlds outside the world not mean asking for the self-contradictory, a task not even possible for God almighty? However, there is an alternative way of approaching the question.

(2) From a position literally outside the empirical world, there is certainly no chance of discovering a measure of that selfsame world. We have to look inside the world, where what we find are human agents. As embodied agents, we are not only objects of observation, we also enact subjective intentions, plans and felt bodily states. Accordingly, we occupy a *role* that is different and distinct from that of objects of observation. Taking that to be a fact that is also true about us, I suggest the following answer.

As embodied subjects, we are not literally placed outside the world. *But in the role of agents, we are 'outside' the sphere of descriptive facts*. This role supplies the distance from the empirical world inherent in the practice of using global models. Only as related to an embodied epistemic subject with a *dual role* like this as a measure, can the particular, world-distinguishing size of empirical objects be an object of propositional knowledge. And because I am not dealing here with objects beyond the realm of *possible or conceivable* knowledge, I conclude that empirically extended objects *have* a particular size only in relation to such subjects.

This concludes my argument to the effect that somewhere in the universe 'dual role subjects' *must* exist, an assertion which, if true, validates my first subclaim. Before examining the factual realization of this necessity (III), I turn to the second subclaim on temporal extension.

II

Is there a temporal dual role that corresponds to the spatial dual role of the human body? It seems to me this cannot be. By placing myself alongside another external object in space, I measure a unit size as representative of the entire empirical world. Assuming time to have only one dimension, no line segment can be brought alongside another, and so no temporal measure procedure could possibly correspond to the global determination of empirical size in space.

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Instead of stopping with this abstract point, however, let's turn our attention once again to the way perspectives and models can be seen as visible expressions of global size determination in space. Do we not have temporal parallels to such perspectives and models? In fact we do not – as illustrated very well by Graham Nerlich:

> If I see an extended happening, then I see it as taking the same time to happen as it takes me to see it. Its extension in time [...] seems exactly the same as that of my seeing it. So fast-or slow-motion photography looks comic because we see the happening itself as absurdly slow (fast). There is no perspective effect in temporal perception, whereas in spatial perception we are quite used to seeing as huge, distant mountains which fill but a small part of our visual field.[8]

I believe Nerlich's observations can be explained by the fact that, on further reflection, seemingly temporal perspectives turn out to be spatial. Or take a distant train climbing a hill. The movement looks very slow, but that is easily explained by changes in perspectival space. The visual impression of a wagon corresponds perhaps to 10 cm of objects in our vicinity. It is the same with model trains in the living room. In both cases, the visible movement of smaller objects slows down, thus retaining our experience of normal movement. That is – changes in seemingly temporal perspectives are just a way of compensating for variations of spatial perspectives, with no perceptual change in temporal duration *per se*. This is confirmed in cases of temporal duration without spatial movement. Light signals or sounds emitted from distant or artificially small objects do not slow down.

The 'comic' effects mentioned by Nerlich may be explained by facts like these. Due to our dual bodily role as subject and as object respectively, we are empirically able from one position in space to measure a 'global' unit size in another position in space. But there is no such measurement of temporal phenomena from one position in time to other positions in time.[9] Therefore, we cannot observe a global change in temporal unit size. We only have a change in normal *relations* between our own doings and what goes on in other

[8] Graham Nerlich, 'Time as Spacetime', in R. L. Poidevin (ed.), *Questions of Time and Tense* (Oxford: Clarendon Press, 1998), 130.

[9] Cf. Saint Augustine, *Confessions*, book 11, transl. V. J. Bourke, *The Fathers of the Church* vol. 21 (Washington, D. C.: The Catholic Church of America Press, 1953), 359f.

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regions of *space*. And so we cannot but perceive fast or slow model happenings as abnormal or even comic.

I still can recall very well the first time we saw a film in fast motion at school. The whole class laughed. And I believe one never quite gets used to watching slow replays as if they were completely normal. How could one? Because they are slow in relation to everything else in the perceived world, the change is relational, not global. Again, consider temporal phenomena with no spatial movement involved, like hearing someone singing a song. Without having already changed our sense of musical normality, we cannot perceive a piece with an abnormal tempo as normal. But that is exactly what we do in space. Without having already changed our sense of empirical normality, we experience pieces of spatial variations as normal. They are perceived to be normal because they are global – a feature for which there is no temporal counterpart.[10]

Then if I am right in what I have said about objective size in space, there is no corresponding duration in time. In space, the thought that a unit of length is not double its own size may instantiate real empirical knowledge. In time, it is propositionally empty – a view to which I believe most contemporary philosophers of time would subscribe. My own transcendental concern in stressing the lack of global temporal models is to highlight the contrast to global, propositional knowledge of spatial size.

This does not mean that one cannot speak of 'knowing' singular, temporal duration at all. As everyone knows, depending on the kind of activities in which we are engaged, the experienced size of time units differs widely from context to context. When you are bored, time feels slow, when you are having fun, it feels fast. And for the bored person, *everything* 'takes longer', so the differences are not felt only locally, in relation to other happenings. They are differences of unit length, on a global scale. Then, when speaking of 'knowledge', we have to work with *global but not propositional* knowledge.

Ascribing this kind of knowledge to a disembodied, omniscient being is something I would find very counterintuitive. How could such a being possibly know the difference between ways of bodily engagement with the world from her own case? So neither in the spatial nor in the temporal case does ascribing knowledge of particular size to such a being make much sense. I therefore

[10] We certainly represent lots of phenomena – e.g. on the cosmological or subatomic level of the sciences – as slowed down in temporal models that are not perceived as abnormal. The reason for this I take to be that we have no normal perception of those phenomena either.

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conclude that only in relation to human beings are units of space and time possible objects of knowledge, be they propositional or non-propositional. As far as I can tell, this speaks in favour of the transcendental idealist view that space and time are phenomena of human experience.

III

Returning to spatial models as evidence for the occurrence of 'global' propositional knowledge of size, I claimed at the end of part (I) that somehow and somewhere 'dual role subjects' must exist as a measure of worlds. What is the factual merit of this claim?

For size determination, in addition to sensation and model representations, Paul and Mary are in need of *indexical identification*, i.e. knowledge of the following kind: 'That thing is so big/small compared to the fat man in the mirror, and *I am the fat man*'. Thus at the basis of spatial knowledge we find the familiar phenomenon of perceptual self-identification, as when suddenly awakening from a dream, I see my own foot at the end of my bed – before recognizing it as my own. I then identify an object perceived with myself as the subject perceiving the object. And since in singular spatial size determination I am also a measure of worlds, somehow the indexical identification involves comparing myself as an object of description with myself as a subject in a different, non-descriptive role. I now turn to the question of how I may fill this role as subject beyond the sphere of descriptive facts.

What about the *expressive* role of 'I', as in a normal statement such as 'I feel pain in my left leg'? In simply expressing my pain, I do not describe myself. This does shed some light on the phenomenon of indexical identification, if combined with Wittgenstein's remarks on the uses of 'I' not 'as object' but 'as subject'.[11]

According to Wittgenstein, a typical subject use of 'I' (or 'my') is in my saying that I feel pain in my left arm, whereas in 'My left hand is dirty', we have an object use of 'my'. In both cases, I may be mistaken in some way. Perhaps, on further reflection, I would not characterize an itchy feeling as painful, and perhaps it was not dirt but sunburn. But one kind of mistake is impossible in the first and only the first case: an error due to misidentification. I may be wrong because I mistake another person's dirty hand for

[11] Ludwig Wittgenstein, *The Blue and Brown Books* (London: Basil Blackwell, 1958), 66f.

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my own, but I cannot be wrong because I mistake another person's feeling of pain for my own.

So somehow a consciousness of my mental states entails a consciousness of 'who I am', a striking fact that contributes to explaining the immunity to referential error of both subject and object use of the first person singular: Having understood the word 'I', I cannot wonder, 'Am I the person feeling pain right now?', and then I cannot consciously apply this pronoun to a non-existent or wrong person. And in this way, expressive features of 'I' at least partly account for its distinctly indexical occurrence in 'I am the fat man'. But what about the subject's distance to the object of the identity statement? In looking for a global measure of size, we need an embodied standpoint beyond the sphere of descriptive facts, and it seems no purely expressive consciousness can supply such a standpoint.

The expression of pain is an expression of my bodily state. As such, it may be conceived of in isolation from the environment or as a natural part of the causal nexus of things. In and of itself, it yields no particular perspective 'from above' perceptual objects of description, and so it supplies no measure of global space determination. We have to look elsewhere, and indeed the answer may be close at hand if we leave behind the causal nexus of things and enter instead the sphere of *rational agency*. As agents, we are able to 'suspend' desires exerting causal influence on us, to use John Locke's phrase.[12] And generally, agent consciousness seems to fit very well with the general phenomenon of indexical consciousness.

I do not act on the basis of descriptive perceptual knowledge of myself or the environment unless I am able to recognize myself as myself, as in 'That foot will soon be bitten by a snake – and the foot is *mine*.' Therefore, human agency is generally held to be a sufficient condition of indexicality. My suggestion is to regard it as a necessary condition of indexical space determination as well, supplying the role of the human body that we are looking for beyond the sphere of descriptive facts.

Reflecting on what to believe, intend or to do regarding some occasion, I do not describe my brain or other parts of my mental or physical self. Thinking, 'Since I now see neuron X firing in my brain, the rational thing for me to believe or do, is Y', makes no sense. Generally, I cannot conceive of my more or less rational behaviour in descriptive terms as caused by external or internal events. So from the first person perspective, my behaviour is not

[12] John Locke, *An Essay Concerning Human Understanding* (London/New York, 1910), 184.

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sufficiently explained by causal antecedent conditions.[13] It also involves irreducibly normative concepts from the space of reasons. That is, descriptive facts do not fully explain my behaviour as a conscious, rational agent.

Then, concerning my utterance of 'I' in practical contexts, its correct application does not depend on true descriptions of my body. Rather, in realising my thoughts, I may say 'I do this now' as a statement of intention, an utterance that in modern parlance carries 'world-to-mind direction of fit' and so is not open to falsification by empirical matters of fact. Or consider the case of my leaving a party and heading for the door with the words 'I am leaving you now'. Normally, this is not intended as an assertion about me, but as an expression of more or less rational action.

Perhaps upon leaving the party I see myself in a mirror, thinking 'That is a fat man!'. Then identifying that person with *me* is a case of identifying an object of description with myself in the role as rational agent. This role cannot be identified 'just by looking', i.e. by scrutinizing an isolated bodily movement. But as part of a rational *pattern*, it seems indeed to incorporate two roles of the kind required by a real, existing world measure: Causally, it is part of the physical world. From a rational standpoint, it instantiates a different kind of world order. And conceiving of myself in the latter role, I am able consciously both to 'step back' from the world of perception and empirically to compare it with myself as one among many objects of perception.

Returning to the case of Mary, what she initially does not know is the singular or particular size of objects. As her indexical discovery makes clear, more than sensation is involved in such knowledge of size. And indeed, as a living agent, conceiving of her bodily movements as possible expressions of rational thoughts, she evaluates her own behaviour from a standpoint beyond the sphere of descriptive facts. In this role as rational agent she has a subjective-indexical experience of her body as, say, *this big*. But the body is also an object of perception, the size of which may be compared with other empirical things. In this way, as a 'dual role subject', Mary is a singular measure of worlds in person.

Several years ago, Elisabeth Anscombe eloquently proposed taking agent consciousness to be a general, sufficient and necessary condition of indexical identification:

> 'I am this thing here' is, then, a real proposition, but not a proposition of identity. It means: this thing here is the thing, the

[13] Cf. John R. Searle, *Rationality in Action*, (Cambridge, Mass.: The MIT Press, 2001).

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> person [. . .] of whose action *this* idea of action is an idea, of whose movements *these* ideas of movement are ideas, of whose posture *this* idea of posture is the idea. And also, of which *these* intended actions, if carried out, will be the actions.[14]

As should have become clear by now, I propose we take this to express a truth about 'I' at least in its role in indexical size determination.[15]

All in all, a nice little story, isn't it? But is it true? Of course, no one not already committed to a more or less similar theory would be convinced by a meagre sketch like this.[16] But does it not at least carry a certain amount of plausibility? Then we do not have to consider the quest for a non-descriptive element in indexical identification an empty dream. As a rational agent mastering the pronoun 'I' in perceptual self-identification, I may reasonably be said to fill the necessary non-descriptive role.

In this way, reflections on spatial size and consciousness of free and rational agency turn out to mutually support each other.

On the one hand, in my role as rational agent, I conceive of myself as a subject whose movements take place independently of causal antecedent conditions. From (III), we have an account of *how* the kind of subject required for spatial size determination might be realised in human agency. On the other hand, there is the further question of the possibly illusory character of this self-conception. Are we not just causally determined parts of the natural universe after all? But considering the results of (I), the occurrence somewhere in the universe of epistemic subjects *conceiving of themselves in the role as rational agents* seems to be a condition of possibility of globally determined, particular objects in space. How then could this self-conception be 'illusory'?

[14] G. E. M. Anscombe, 'The First Person', in Q. Cassam (ed.), *Self-Knowledge* (Oxford: University Press, 1994), 155.

[15] Admittedly, Anscombe denies that what I call 'indexical identification' is a 'proposition of identity'. However, I do not believe this divergence makes any difference to the present issue of size determination.

[16] On the other hand, stressing the necessary practical features of 'I' really is not that controversial. Or take the similar cases of 'here' and 'now'. Many philosophers agree that my 'knowledge' of being 'here now' is of a practical nature. Only, for that very reason, they are keen on excluding such knowledge from the ontological realm of 'objective' facts. The transcendental approach to these matters I take to consist in regarding the non-propositional features of human subjectivity as a precondition of the same objectivity.

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Rationally free agents would be exactly as 'real' as the world of spatially determined objects whose conditions they are. And as such conditions, we cannot be parts of the causally closed natural world. Rather, we seem to incorporate a causally distinct order of transcendental freedom.[17]

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