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development of self.²² They are also the best defense against moral error.²³

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TWO PROBLEMS FOR EVOLUTIONARY EPISTEMOLOGY: PSYCHIC REALITY AND THE EMERGENCE OF NORMS*

Neil Tennant

On locating our perspective: the problem of psychic reality

Naturalized philosophy, of which evolutionary epistemology is a specialized branch, offers itself as a radical alternative to any "first philosophy". It does not lay fundamental doubts to rest. It does not pour metaphysical concrete into the skeptic's trenches so that the scientists can come afterwards and build their edifices. Nor does it lay down preconditions for the very possibility of knowing and then show no scientific interest at all in how those preconditions are realized. Rather, it accepts present scientific theories as a contextually necessary starting point, and extracts from them as much information and explanation as it can about the nature of knowledge itself, and the processes of acquiring it. In the days of first philosophy, when it was thought that we did not know all that much for sure, there was correspondingly less that we could know about what we might know and how we might know it. In the wake of major scientific revolutions since then, scientific knowledge has extended the potential reach of its descriptions and explanations to the point where it can become its own object. The theorist of knowledge must now know much more theory than before, before he can theorize about knowledge.

To the first philosopher, of course, this just begs the question: why invoke more theory when one is pressing doubts about all theories and any theory? But to the naturalized philosopher, one does not "beg" the question in this way. One has to bury it. The only progress to be had is by way of what Vollmer has called a virtuous circle. We invoke more refined theories to explain the aberrations of less refined ones: just as by using a microscope to examine a hand lens one may explain some of the distortions and double images

²² "Hume on Heaps and Bundles", p. 295. Relevant is the strong propensity almost everyone has, according to Hume, to "over-weaning conceit" of oneself: "No one can well distinguish in himself between the vice and virtue, or be certain, that his esteem of his own merit is well-founded . . ." *Treatise* pp. 597-8.

²³ Helpful comments on this paper were made by Samuel C. Wheeler III, Susan James, Gregory Trianosky, Herbert Fingarette, and also members of the philosophy department at the College of Charleston, and finally by Edward Craig. Some of these comments are reflected in revision; others will be addressed in the book on character that is now underway.

* Ancestors of this paper were read to the Staff Seminar of the Department of Philosophy, The Faculties, A.N.U.; to the International Conference on Evolutionary Epistemology, held in Newcastle, NSW in July 1987; and to the Annual Conference of the Australasian Association of Philosophy, held in Brisbane, August 1987. I am grateful to members of those audiences for comments, and also to Philip Pettit and Russell Hardin for discussion. Translations of German passages quoted are my own.

that the hand lens produces of objects seen more clearly by means of the microscope.

But some of the worries of first philosophers and of transcendental epistemologists still carry over to the answer offered by evolutionary epistemology to the main question to be answered by any theory of knowledge:

what are the objects, scope and limits of human knowledge? and what are the correct methods for obtaining it?

Ironically, these worries on the part of the first philosopher derive from the licit emphasis that evolutionary epistemology allows one to place on the adjective "human" in the phrase "human knowledge". A first philosopher, surrounded on all sides by skeptical doubts on all matters, cannot allow the word "human" to play any significant role in the question. It certainly cannot be allowed to be drawing attention to the properties of our own species' knowledge, as opposed to that purportedly had by other species. For that, from the point of view of the universal skeptic, would be to concede too much. Nor, strictly, can the word "human" be allowed to advert to the communal or social or interpersonal nature of the knowledge in question; for that would be too much of a move towards peopling the world of the knowing subject with other people, other subjects. Rather, the word "human" is external to the posing of the question. One uses it while deliberately dropping one's skeptical guard, as it were, to direct the audience's attention to the predicament of the individual human knower. Then one raises their guard with the usual skeptical manoeuvre, challenging them, on behalf of this generic individual human "knower", to make good his claims to knowledge.

By contrast, the meaning allowed by the evolutionary epistemologist to the word "human", and the pragmatic role he has it play in the posing of the question, is exactly what any competent speaker would take it to be. Here we are, one species among many. We make knowledge claims, we challenge knowledge claims, we make assumptions about what others know; we distinguish knowledge from merely true belief. *Pace* the more legislative of analytical philosophers, we even stretch the extension (not necessarily the meaning!) of the word "know" so as to allow non-human beings to know various facts or things. And the question was: when we are the knowers, what can we know about, and how much can we know about it? and how might we come to know it? There is an agreeable relativity here. We seem to be offered the prospect of

contrasts and comparability, points of contact and sundry marks of uniqueness, in a comparative, inter-specific science of the knowing process. To the naturalized philosopher, we are but part of nature; we do not create it, nor do we deny access to it on pain of self-centred pre-conditions. There is no reflexive paradox in the suggestion that a part of nature could reflect on all of nature, including itself. To the evolutionary epistemologist (a special variety of naturalized philosopher), the challenge of such a comparative epistemology, covering all species and all the different forms that knowledge and coming to know might take, is an especially congenial one. Wherever there is process, growth and change, structural storage of information and transfer of inherited or acquired information from one body to another, the evolutionist has a host of models, schemata, mechanisms and methodological maxims to offer.

But then this is where some of the worries that I mentioned earlier make themselves felt. The worries are not in their original form, from the side of first (or transcendental) philosophy pitted dogmatically against naturalized philosophy. Rather, the main worry is a transmuted one that can be pressed because of the very problems addressed by the evolutionary epistemologist, and the very materials from which, by his own lights, he has to fashion his solutions. The worry is this. As evolutionary scientists we are taking a relativistic stance on various kinds of perceptual and cognitive apparatus. As early as 1895 Simmel had put it as follows:

The sensory impressions with which animals respond to the influences of their environment must deviate most markedly from ours in many ways. Doubtless some animals have sensations which we completely lack – this is shown both by some of their ways of behaving and also by the discovery of neural apparatuses of which we have no analogue; others likewise no doubt lack certain senses which are peculiar to us; with yet others the acuity of qualitatively similar experiences is greater or lesser than it is for us. The cause of this diversity cannot but be that one kind of animal finds one kind of sensory equipment the most useful and best suited to its conditions of life, another kind of animal another. But then it is inevitable that from such different material wholly different pictures of the world will arise.

It is compatible with – perhaps even implied by – what Simmel wrote that we should no longer assume that we are at the pinnacle

of the evolutionary order, nor that we are the only actual or possible species that could properly be said to know and to seek to know. We acknowledge the possibility of further evolution, whose distant products could one day look upon us in something like the way, perhaps, that we look upon chimpanzees. We regard different species as differently equipped, by their respective past selective regimes, to deal with different kinds of exigencies. We explain their perceptual and intellectual quirks by reference to the survival problems they had to contend with during a specific phylogenetic past. From our vantage point, we say they interacted with their environment; just as (so we hope we can say in the same detached way) we and our ancestors interacted with ours. As a result of this realist pitting of creature against creation and other creatures, we have a myriad different adaptations effecting agency in the broadest sense. Perceptual mechanisms vary; so too may species' conceptual apparatus. Those that receive and process perceptual information from their surroundings, and act accordingly, so as to optimize their use of resources and to maximise their inclusive genetic fitness, are, in the broadest sense, intelligent or thinking agents. In addition they might communicate acquired information among themselves. If the method of communication is sufficiently versatile, flexible and open – especially, say, if it has a creative or generative grammar – then there is further reason to regard them as both rational and conscious as well.

But from what vantage point could we ever render transparent the nature of their knowledge (even of the most mundane features of their surroundings) to ourselves? If their perceptual and cognitive resources differ dramatically from ours, can we even begin to form a conception of what it is like to know that which a bat knows, let alone what it is like to be a bat? As Nagel confesses (*Mortal Questions*, p. 168)

Facts about what it is like to be an X are very peculiar, so peculiar that some may be inclined to doubt their reality, or the significance of claims about them.

It seems that the very most one could do is render their propositional contents in some rough and ready way in our own system of representation. We would have to rest content with dim glimmerings of what features and resonancies their life world contains, of what is significant or salient to them. We would remain prisoners of our own evolutionarily conferred perspective. Yet, as evolutionary epistemologists, we would be trying to transcend the

limitations of that perspective by putting forward a theory according to which our own perspective ought to be but one among many, and should occupy no privileged position among them. And, so the worry might develop, we might not be able to characterize those other perspectives properly. We are bound to sully them with some human overlay, to domesticate their contours, to humanise their contents and the categories by which they are constituted. Our very epistemological egalitarianism, coupled with the admission of our own evolutionary contingency, produces a transcendental push that threatens to propel us out of that comparative framework, and force us to take up a reluctantly arrogated view from only we know where.

This worry, however, should not drive us back to transcendental idealism. It is one thing to admit specificity of perspective; it is quite another to concede total limitation of view. It is not as though there is only one focal distance, putting only our knowledge and our means of knowing in view. We can vary our focus, and seek still to contrast and compare. We can, if we like, try still to make imaginative amends for the limitation that we have to apprehend things from our own position within the total scheme. But even without such imagination – which may well be scientifically questionable – we can still broaden the basis of considerations from which we infer to the best explanation of our own place, alongside that of other species, within the scheme. Naturalized epistemology remains natural; and evolutionary epistemology, like any other unfinished business, can still evolve.

The specificity of perspective has to do – in Kantian terminology – with the categories we employ to frame our knowledge of the external world. I have argued elsewhere (*Philosophy, Evolution and Human Nature*, chapter 3) that the evolutionary transformation of Kant's doctrine ought not to take space and time as forms of intuition distinguished from the categories. Rather, we should include as categorical those basic spatial and temporal relations commonly employed (but under different axiomatizations) for topology and geometry, both Euclidean and non-Euclidean. Our categorial framework then includes temporal, spatial, causal and substantial (sortal) properties and relations. It is this intellectual apparatus that we have inherited from our forebears, and with which we confront the world.

The transcendental worry, once again, is whether the affordances of this apparatus are of things as they are in themselves; and whether there is any residue of the real that could or must elude us.

The worry is reinforced by the reflection that, from an evolutionary perspective, this scheme is but one among many. As evolutionary epistemologists, we adopt a realist perspective to the extent that we regard the apparatus in question as the result of interactions between organisms and an external world (which includes other organisms). Each such apparatus, as an accidental by-product of a species' descent, affords its possessors only a highly conditioned perspective. Forgetting this for a moment as it applies to ourselves, we can look upon the water shrew, and conclude that its conception of space is defective, in that it is scarcely more than topological, and appears to lack the "right" metric. But we should immediately find pause if we reflect on the question whether there could not be a species of intelligent beings similarly placed with respect to ourselves.

To be sure, our theories and our technology have helped us gain access to features of the world that we cannot directly observe. Segments of the electromagnetic spectrum, for which we have no evolved detectors, have been made manifest in less direct ways. We have even changed our conception of the global geometry of space, placing ourselves intellectually at odds with our immediate intuitions as to the structure of space in the small. We have posited vast populations of tiny and huge entities, to bring explanatory order to the perceptual flux generated by our contact with middle-sized objects, including cloud chambers and photographic plates from radio telescopes. We have struggled to form adequate conceptions not only of what there is, and how it is, and how it has come to be so, but also conceptions of *what it is like to be* some of it. In a realist vein we have not rested content with arguments by analogy concerning other human beings' minds. We have even imagined it possible, by attending to both analogies and dis-analogies of anatomical structure and functioning, if not to *acquaint* ourselves with what it is like to be a creature of a different kind, then at least sensibly to *register the existence of a fact* as to what it is like to be one, inaccessible and impenetrable though such a fact may be.

A world now swarming with differently conditioned centres of awareness calls for careful steps on the part of epistemologists visually attuned to electromagnetic wavelengths of between 380 and 760 nanometres, aurally attuned to frequencies between 16 and 16000 Hertz, similarly limited on smell, taste and touch, and not even conscious of their socially potent emissions from crotch and armpit.

Much has been said about the mutual unintelligibility of different categorical frameworks; and there are Davidsonian doubts as to the very possibility of the existence of frameworks different from ours. I think that the evolutionary epistemologist has to concede their multiplicity, in the spirit of Simmel; but whether it is a multiplicity that presupposes mutual unintelligibility is a more difficult and deeper question. For to admit their possible mutual unintelligibility immediately raises the worry that we wouldn't have any grasp at all, as would-be comparative cognitivists, of what we were taking ourselves to be comparing with the cognitive apparatus of our own species.

Thus far I have spoken only of our cognitive apparatus and the categorical notions employed within it. I take it that these correspond to primary qualities, not secondary ones. Now it may be an important feature of consciousness that it be involved wherever there is rational revision of attitudes on the basis of perception or mental mulling, as in mathematical calculation; but equally I take it that consciousness is involved in the apprehension of any secondary qualities, regardless how rudimentary the cognitive wheels may be behind the perceptual register.

Should evolutionary epistemology even concern itself with possible facts as to what it might be like to be immersed in the manifold of intuition belonging to a bat? Should it aspire to the status of what Nagel engagingly calls "objective phenomenology" (*loc. cit.* p. 179) — whose

goal would be to describe, at least in part, the subjective character of experiences in a form comprehensible to beings incapable of having those experiences . . . ?

Does bats' sonar sense serve up glows and shines, hazy and fuzzy outlines of looming masses, or stark silhouettes? Can they have duck-rabbit sonar data? Would Morse code look to them like a Mondrian? Do ripples on a pond strike them as hums? Spiderwebs as screeches? Do they in fact immediately intuit scrumms? (A datum is a scrum if and only if it is detected before 1988 and is a screech; otherwise a hum.) The imagination runs wild; one wonders, indeed, whether this is not a domain for a schizophrenic poet rather than a philosopher. What possible constraints can give sense to these questions? what could possibly be the criteria for a correct answer?

Evolutionary epistemology suffers no loss if it backs off from such speculations. One can still seriously study the apparent range of

stimuli to which a bat is sensible; one can still try to make out, in one's own terms, the distinctions it seems to make in its own dealings with its environment. But the dewy-eyed empathy, and the realist heavy-breathing that goes with it, have no place in the project. One does not want to *be* a bat; one does not want to be *like* a bat; one does not even want to know *what it is like* to be a bat; but one might just be able to get some idea, albeit in one's own terms, of *what the world is like to a bat*. I say *the world*, not *our world*; that much of the hypothetical realism endures. Our world is an approximation, in our terms, to the world; the world itself is open to comprehension in different terms; and our own terms are open textured. Creatures like bats may even become epistemic proxies in revealing to us aspects of the world to which adaptations of our own terms might fit. Studying bats in our own present terms might lead us to inquire after the cause of certain behaviour (behaviour that speaks, say, of a discrimination of some saliency for it). Knowing enough, in our own terms, about its perceptual mechanisms, we might thereby become aware of the nature of that saliency, and render it accessible to ourselves in a novel extension of our own terms. And this could happen in a way that would not have been possible but for our interest in the bat in its relation to the world on its own terms.

Could ought evolve from is?

Some emergent phenomena, like the psychic reality of bats, will pose perennial difficulties for metaphysics, the philosophy of mind and the science of cognition.

Other emergent phenomena may be more tractable. Indeed, seeing them as emergent may be half the solution to their problematic status; and seeing their emergence as evolutionary may be the other half. The phenomena I have in mind here are the norms that govern our rational thinking and our dealings with one another: the norms of logic, and moral norms. I think it would be a special vindication of the evolutionary approach if it could reveal some common basis in the emergence of both kinds of norm: if it could provide a unified account of normativity both in thought and in social behaviour. It would be especially satisfying if the account could make it clear why there is such a strong temptation to regard inferences from factual to deontic statements as fallacious; while at the same time showing that the norms themselves supervene on a factual basis – that they arise from natural, causal processes.

The project would be easier, and less interesting, if morality were an *a priori* product of pure reason, and the norms governing our reasoning could be shown to have evolved. But I do not intend to rest my argument for a common natural basis for the two kinds of norms by winning only half the evolutionary battle and appealing to reduction for the rest. For I do not believe the reduction goes through (important though the interconnections between right reason and moral goodness may be).

The project threatens to be messy, and possibly to get bogged down, because of analytic intricacies concerning canonical forms of normative and valiative statements in general, and the logical relations among them. So the analytic task is not one to be undertaken here, where only a sketch of the leading ideas is possible. It would involve choosing some central ways of stating norms or ascribing value; but I shall defer the more detailed work on grammatical niceties to another occasion.

The project appears not to have any great historical names attached to it. Hints of like inclination may be in Aristotle or Hume or Kant; but they are not developed into the sort of account I envisage. Husserl is possibly more interesting on this score, as he runs together a discussion of the force of "soll" in logic, mathematics and morals in a work that also contains one of the best succinct statements of evolutionary epistemology before Konrad Lorenz's famous paper. I refer here to *Logical Investigations*, Volume I. The respective places are chapter 2, entitled "Theoretical disciplines as fundamentally normative", and chapter 9, entitled "The principle of thought-economy and logic". More recently Edna Ullmann-Margalit has written a study of the "emergence" of norms in which she confines herself to a rational reconstruction of various social norms, as solutions likely to be reinforced to various kinds of game-theoretic situations in which social beings can be placed – generalized Prisoners' Dilemmas, and situations of coordination and of inequality. Her work, however, despite its title, is deficient in an important respect: it does not tackle the question of *how* the norms emerged. It does not account for the evolutionary or causal mechanism by which they are established. It is an exactly similar shortcoming to the one in Bennett's *Linguistic Behaviour*, as pointed out in my paper "Intentionality, Syntactic Structure and the Evolution of Language". In that work Bennett explains, by drawing on Lewis's work on convention, how linguistically unstructured items might acquire conventional meaning. He explains also how we may gather evidence, on being confronted by

users of a *structured* language, as to what the structural features are and how they affect meanings of complex sentences. But he does *not* account for how the structure *came to be* a feature of the developing language. Now I have tried elsewhere to make good this sort of shortcoming with an account of the aetiology of entrenchment of meanings of logical operators, as they enter a growing language. (See *Anti-Realism and Logic*, chapter 9.) What I wish to canvass here is the possibility that evolutionary approaches to the development of linguistic conventions, and to the development of social practices and forms of behaviour, might be ripe for unification. Could similar processes have given rise to norms both moral and logical?

I am not aware of any writer who has tried to give a unified account of both kinds of norm. Indeed, no-one, so far as I know, has tackled the problem of how norms of reasoning may have evolved. There is only a hint in Simmel:

... certain norms governing the behaviour of our thought, in keeping with the utility principle, first give rise to that which we term truth, norms which are stated in abstract form as laws of logic.

But how our thought came to behave that way, came to conform with the laws of logic, he does not say.

I believe that something closely analogous to Kant's well-known method of universalization in ethics can be applied so as to justify the canons of reasoning in mathematics and science. If this idea can be carried to completion, it could provide the common strand sought in a satisfactory evolutionary account of both moral and logical norms.

Let us recall the way Kant intends his method to work in the case of moral norms:

... I ought never to operate in any way other than that I be able also to will that my maxim should become a general law. Here now indeed is bare lawlikeness ...
(*Grundlegung zur Metaphysik der Sitten*, Akademie-Ausgabe 401/2)

His categorical imperative received two similar formulations later in the text, at p. 421:

... act only according to that maxim, by which you can at the same time wish it to become a general law.

and

... act as though the maxim of your action should by your will become a general law of nature

The important features of a law are its publicity and generality. Kant immediately illustrates how his categorical imperative can yield lower level moral principles such as:

- i) one should not commit suicide in the face of suffering and despair
- ii) one should not make promises (such as to repay borrowed money) that one cannot, and does not intend to, honour
- iii) one should not squander one's natural talents
- iv) one should not, when comfortably placed, refuse to extend help to others in dire need

One might challenge some of Kant's explicit or hidden premisses in the application of his universalization test to yield each of these four results. But the examples serve to make his intentions clear. Most importantly (for our considerations) is the fact that in all but the third example (the least persuasive one!) the "impossibility" involved – the way it would be impossible for the maxim to become a general law – is one of *systemic breakdown*. Kant thinks that any species whose members killed themselves as soon as they first experienced duress would go extinct; that any community of inveterate promise-breakers would no longer have an institution of promise-keeping or even promise-making: the utterance of "I promise you that ..." would be an "*étiles Vorgaben*" (an idle pretence); and that if human beings were to refuse one another even minimal measures of altruism, they would cease to be a social-living species as we understand it.

A remarkably similar sort of justification can be given, I maintain, for norms of reasoning. (I shall limit myself to deductive logic for the time being.) Suppose we have, say, a connective ϕ in our language whose meaning is given by the convention that one may assert $A\phi B$ on the basis of a proof of B from A . Then one can criticise as wrong any step in reasoning that has the form

$$\frac{B \quad A\phi B}{A}$$

by invoking Kant's universalization test. For you cannot will the last rule to become generally entrenched in the language. To see

this, look how it could be used (modulo the usual rules for &) to prove any proposition A from any proposition B:

$$\frac{\frac{\frac{}{(1)}}{A \& B}}{B} \quad (1)}{B \quad (A \& B) \notin B} \\ \frac{A \& B}{A}$$

A language whose "logic" allowed any conclusion to be drawn from any assertion would be unable to convey information among its users. Such systemic breakdown threatens any deviation from the pattern of such rules, for the introduction and elimination of logical operators, as are in *harmony* with each other. For the logical operators to carry the meaning they do, and to fulfil their respective functions in the flow of survival-relevant information, this "transcendental" constraint must be met: one should not be able to extract more from an assertion than is needed in order to be able to make it in the first place.

Such conservation principles are at the heart of current proof-theoretic theories of meaning, and seem to me to marry well with rational reconstructions (in Ullmann-Margalit's sense) of how languages with logical operators could have evolved. They represent systemic constraints on the development of syntactically structured codes of communication. They are examples of general constraints on (dare one say: preconditions for the very possibility of?) higher-level, emergent functions of complexes whose constituents have already acquired established, lower level functions that are to be sustained even when enmeshed in the new complexities.

As noted above, I have treated elsewhere the question of the evolution of syntactically structured languages, and the question of the logic justified by considerations of conservative extension (respectively: "Intentionality, Syntactic Structure and the Evolution of Language"; *Anti-Realism and Logic*, chapter 9.) Note that harmony between introduction and elimination rules is a transcendental constraint on the *conceptual roles* played by logical operators. The evolution of conventions makes it an "accidental" or "arbitrary" matter which word or expression comes to play the role

of, say, conjunction in a given language; but *that there is such a role to be played* is no accidental matter.

Husserl's criticisms of an evolutionary approach

In conclusion I wish to draw attention to Husserl's forceful statement of the basic tenets of evolutionary epistemology (see chapter 9 of his *Logical Investigations*, volume 1). But I want also to parry his very weak and dogmatic criticism of what he saw as its shortcomings, unsupplemented by the transcendental trick I have tried to turn above. Husserl writes, after a discussion of the algorithmic character that arithmetic has assumed (p.204):

The analysis of these and similar types of method and the final explanation of their accomplishments forms [sic – N.T.] perhaps the most beautiful and in any event the least developed field of a theory of science, but particularly of the important and instructive theory of deductive (or, in the broadest sense, mathematical) method. Naturally nothing is achieved here by bare generalizations, vague talk of the representative function of symbols, of energy conserving mechanisms and the like; one needs above all deep analyses, one must really investigate each typical distinct method and establish the economical achievement of each method once one has an exact explanation of what that achievement is.

(*Logical Investigations*, Chapter 9, Section 54)

I submit that the proof-theoretic methods and an appropriate theory of meaning are now at hand to accomplish this task. In the absence of these methods (Hilbert being too late a contemporary) Husserl had pressed his critique of psychologism to undermine the higher reaches of evolutionary epistemology.

But a reading of his main target, Avenarius, shows that it is not really the fault of evolutionary epistemology that Husserl was able to score some points. Avenarius's little tract *Philosophie als Denken der Welt gemäss dem Prinzip der kleinsten Kraftmasses* is truly dotty – a piece of would-be naturalized epistemology slavishly applying the principle of least action from physics. In Avenarius's hands it yields a thoroughly unconvincing account of our mental processes, of our conceptual apparatus and of the development of philosophy as the outcome of a grand principle minimizing mental work. There is nothing particularly evolutionary about his approach; Avenarius puts forward a synchronic physiology of thought of the crudest

variety. He writes of "*das Streben der Seele nach Kraftersparnis*". In the foreword his intention is painfully clear:

The change that the mind occasions its ideas on receipt of new impressions is a smallest possible one. The mind accords an apperception no more energy (*Kraft*) than is necessary, and gives preference to that one among a multiplicity of possible apperceptions that carries the same load with smaller expenditure of energy, or a greater load with the same expenditure of energy; under favourable circumstances the mind itself prefers, to a momentarily smaller expenditure of energy with which, however, a smaller amount of duration of work is connected, a temporary increase of effort that promises correspondingly greater or more lasting advantages of work.

There is no doubt either that Avenarius is talking not about psychic energy, but about physical or physiological energy (p.13):

Here energy is above all taken in the sense of physiology; the experiences of energy or weakness, or relief or burden, or recovery or exhaustion are regarded only as accompanying phenomena of consciousness.

I shall give only one example of how inadequate a treatment this yields of questions of meaning, logic and rationality. This is his account of contradictions (p. 14):

Another averse reaction is produced by the presence of a contradiction in our thought. The waste of effort lies here in the ineluctable but futile endeavour of thought to eliminate one of the contradictory ideas, or to get rid of the contradiction by means of a third (resolving) idea. The need, however, to neutralize a contradiction establishes once again only the striving after a saving of effort.

(One might ask here whether there is mental-effort involved in the striving to save effort. The reflection does not appear to detain Avenarius. One also wonders what he would make of the modern intellectual industry of paraconsistent logic, that *Streben der schliessenden Seele*, whose goal is a logic that will accommodate contradictions!) In due course he reaches his titular dignification of philosophy (p. 29):

Such scientific thinking directed at the totality does actually exist; and according to the testimony of history it is philosophy

... The totality, however, of the given in experience, or of that which can ever be given in experience, we call the world: hence we conceive of philosophy as thinking about the world in accordance with the principle of least action.

This characterization of philosophy would no doubt have us all in our armchairs occasioning only the gentlest flutter on the spectro-scope of any modern scientist mad enough to seek evidence in support of Avenarius's general thesis. Husserl's anti-psychologism could not have been directed against an easier target. But Husserl was too precipitate in thinking that the normative character of logic and mathematics could be vouchsafed only by the (p. 202)

practical-logical reflection of the researcher, who brings into the scope of insightful understanding the advantages of these artifices of method, and now perfects them in full consciousness, and connects them artificially, producing in this way more complicated, but incomparably more efficient machinery of thought than the natural one.

In my view Husserl makes too arbitrary a distinction between ideal modes of thought or rationality, and those that can be produced by or approximated within the natural realm. He misses, I think, the possibility of there being *transcendental preconditions for the natural emergence* of linguistic and conceptual processes governed by norms. He says of his "principle of maximum rationality" that it is (p. 210)

... obviously no biological or merely thought-economic principle, but much more a purely ideal and eminently normative one... To identify the tendency towards the greatest possible rationality with the tendency towards biological adaptation, or to derive it from the latter, and then to invest it further with the function of a fundamental psychic force – that is a budget of confusions that finds its parallel only in the psychologicistic interpretation of logical laws and the conception of them as laws of nature.

The validity of any "perspicuously recognised ideal norm" is (p. 211)

... a presupposition of any meaningful talk of an economy of thought, and is therefore not a possible explanatory outcome of the theory of this economy.

I submit rather that the proper functioning of the various symbolic processes in question depends on the existence of norms – however

tacitly they may be observed, and despite the fact that they are often violated in practice. These norms (in the form, for example, of rules governing the logical operators) give expression to what Ruth Millikan would call the *stabilizing* or *standardizing* function of those operators: "a function that accords with a critical mass of cases of actual use, forming a center of gravity to which wayward speakers and hearers tend to return after departures." (*Language, Thought and Other Biological Categories*, p. 4). They may be excogitated and articulated only by a very small proportion of gifted intellects (Husserl's '*Bahnbrecher der Forschung*' – and was not indeed Gentzen the first?), but our practice is not thereby imbued or invested with its normativities. The normativities wholly constitute the stable function of the logical operators. Put another way, the rules of inference determine the meanings of the logical operators that they govern. The "explanatory outcome" of the theory of thought economy, or indeed of any more modern evolutionary account, will be an explanation of why the norms are in place. The explanation is characteristically evolutionary: once an operator, such as & say, started conventionally to acquire the meaning of conjunction through repeated simple uses within a community of Gricean innovators, it was stabilized and retained within the growing language only by virtue of being governed by introduction and elimination rules that were in harmony with each other. Departures from the demands of deductive rationality – of faithfulness to conferred meanings – that can be developed by means of proofs in accordance with these rules, can be explained within a model that makes appropriate allowance for differences of performance from ideal competence. The model would allow for errors, say, on deeply nested occurrences of operators within sentences; and it would allow also for the occasional intentionally deceptive departures from what would be demanded by more vigilant reason on the part of one's interlocutor. In brief, it would allow for a variety of characteristic "departures from the center of gravity", either accidental or intentional. Husserl is importantly wrong when he claims that (p. 211)

The few cases of really insightful thinking excepted, (our imagination and judgment) bear in themselves no guarantee of logical validity, they are not ordered purposefully in themselves, either insightfully, or indirectly via earlier insight.

The evolutionary explanation that I favour shows that the hardness of the logical and mathematical musts is as natural as the hardness

of a skeleton. Husserl's trailblazing thought-economists should regard themselves as logical anatomists, not (as he would have them) mysteriously insightful and authoritative makers of new intellectual spare parts. The forces of natural and cultural selection have had to leave logical norms immanent in our linguistic practice, because of the transcendental impossibility of its being otherwise. It may be an arbitrary or contingent matter that we have such-and-such expressions filling just these stabilizing roles, rather than some other expressions filling the same. But *that there be such roles to be filled* is no arbitrary or contingent matter; nor is the fact that, once such-and-such expressions fill these roles, then those very same expressions *ought* to be used this way rather than that.

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References

- Avenarius, R. *Philosophie als Denken der Welt gemäß dem Prinzip des kleinsten Kraftmasses* (J. Guttenberg, 1903).
- Bennett, J. *Linguistic Behaviour* (CUP, 1976).
- Husserl, E. *Logische Untersuchungen*, 1. Band.
- Kant, I. *Grundlegung zur Metaphysik der Sitten*.
- Lewis, D. *Convention* (Harvard University Press, 1969).
- Lorenz, K. 'Kant's Lehre vom Apriorischen im Lichte gegenwärtiger Biologie', *Blätter für Deutsche Philosophie* 15 (1941) 94–125.
- Millikan, R. *Language, Thought and Other Biological Categories* (MIT Press, 1984).
- Nagel, T. *Mortal Questions* (CUP, 1979).
- Simmel, G. 'Über eine Beziehung der Selektionslehre zur Erkenntnistheorie', *Archiv für systematische Philosophie* 1 (1895) 34–45.
- Tennant, N. *Anti-Realism and Logic* (OUP, 1987).
- 'Intentionality, Syntactic Structure, and the Evolution of Language', in ed. C. Hookway, *Minds, Machines and Evolution* (CUP, 1984).
- 'In Defence of Evolutionary Epistemology', *Theoria* 49 (1983) 32–48.
- 'Evolutionary Epistemology', in ed. P. Weingartner, *Proceedings of the International Wittgenstein Colloquium* (Hölder-Pichly, Vienna, 1983) 168–173.
- Tennant, N. and von Schilcher, F. *Philosophy, Evolution and Human Nature* (Routledge and Kegan Paul, 1984).
- Ullmann-Margalit, E. *The Emergence of Norms* (Clarendon Press, Oxford, 1978).
- Vollmer, G. *Evolutionäre Erkenntnistheorie* 3rd edition (Hirzel, Stuttgart, 1983).