

How is contemporary biology used for ideological purposes?

Subtitle: Papaver Somniferum for the masses

Marxism, Science and Ideology

Coined in the 18th century by the French aristocrat Antoine Destutt de Tracy¹, the term 'ideology' was originally meant to describe an empirico-natural (rather than metaphysical or theological) approach to the study of epistemology and human cognition. For the 'ideologues' of the 18th century, our ideas about the external world are natural phenomena that result from our interaction with our environment and not the byproducts of either the human soul or divine providence². By the 19th century, the term 'ideology' was subjected to significant internal re-working as its meaning came to be entangled with the political and philosophical writings of Karl Marx and Friedrich Engels. For Marx and Engels, 'ideology' no longer denoted what it did for de Tracy - that is, a scientific study of how true ideas about the world are formed. Rather, it came to describe the logic whereby the interests of the ruling class are safeguarded vis-à-vis the promotion of distorted and pathological representations of reality itself. For these fathers of the philosophical tradition of historical materialism, an ideology was a constellation of ideas and concepts that reverse or inverse the order of things by making the artificial appear as natural and the derivative as originary. "In an ideology," they famously wrote in *The German Ideology*, "men and their circumstances appear upside-down as in a *camera obscura*, this phenomenon arises just as much from their historical life-process as the inversion of objects on the retina does from their physical life-process"³. In the Marxist sense of the term, then, an ideology is something akin to a veil

¹Richards, RJ (1993), 'Ideology and the history of science', *Biology and Philosophy* 8(1), 103-108.

²A whole tradition of 'illuminationist' epistemology leading back at least to the writings of Thomas Aquinas and Henry of Ghent forms the historical backdrop to the rise of the ideologue's naturalized approach to epistemological controversies. For the illuminationists, the human mind comes to grasp ideas only when aided by the infinite providence of the divine intellect. The effulgent light of God, in other words, was taken to a necessary condition for the generation of human knowledge and, for this reason, entailed the irreducible dependence of epistemology upon theology. Much of this tradition was subjected to secular critique with the rise of modernity in the 16th, 17th and 18th centuries.

³Marx, K, and Engels, F (1846/1970), *The German Ideology: Vol. 1*. International Publishers Co.

that conceals a fundamental truth about reality in order to preserve an existing state of affairs and that, moreover, dissimulates this very act of concealment in order to postulate the truth-value of its own distortion.

Interestingly, as archetypal 'masters of suspicion' (along with Freud and Nietzsche), Marx and Engels were convinced that most of the discourse of the sciences was ideological in nature and that the different scientific endeavors of a particular culture were nothing more than refracted reflections of the interests of the bourgeoisie. Like liberal political economy, the natural sciences were seen as expressions of ruling-class consciousness and thus, in principle, were reducible to the inner working of ideological productions.

Not surprisingly, this reductionism has led prominent philosophers of science to hold Marxism in disregard and to call for a moratorium on Marxist explanations of scientific rationality⁴. For many contemporary thinkers, the worry is not simply that the Marxist schema is outdated (having been designed following 19th century economic principles) but also that it is highly counterproductive as a mechanism for theorizing and guiding scientific knowledge (the rise and demise of Lysenkoism was evidence enough that Marxist theories and scientific research produce dubious offspring). The problem, in other words, is simply this: when all scientific programs are *defined* as ideological and submerged in the waters of partisan motivation and subjective interests in the vein of Marx, science is divorced from objectivity and this divorce, in turn, authorizes all kinds of non-scientific discourses to lay a claim to scientific status (again, see the case of Lysenkoism).

But does this mean that we must purge contemporary debates about science from all traces of Marxism? Perhaps not.

⁴In the 'Preface' to his famous book, *Against Method*, Paul Feyerabend argues that "science can stand on its own feet and does not need any help from [...] Marxists." See Feyerabend, P (1975/1988), *Against Method*, London: Verso.

Beyond Marx – A Revamped Critique of Scientific Ideology

In *Ideology and Rationality in the History of the Life Sciences*, the French philosopher of science Georges Canguilhem urges us to resist the temptation to vilify the Marxist line of analysis *in toto* and take a slightly different path when thinking through the relationship between science and ideology. Although Canguilhem, who was a close reader of Marx, grants that a classical Marxist reading of the epistemology and philosophy of science is no longer viable, he notes that a wholesale moratorium on Marxist terminology may be a injudicious move that could end up depriving philosophers of science of genuinely valuable intellectual resources. Instead, Canguilhem advocates a liberal-pragmatic approach to the Marxist corpus that enables us to take from Marx what works and leave behind what does not. In particular, Canguilhem tells us, the Marxist notion of *ideology* remains an important thematic for the philosophy of science that retains its analytical power and critical force. Once disconnected from Marx and Engels' strict usage, this notion can help us gain a greater understanding of how scientific domains are constituted and how, in some cases, ideological forces usurp them.

As I interpret it, Canguilhem's crucial move lies in deflating the Marxist stance on scientific knowledge and holding, contra Marx, that science can but need not be an ideology. Scientific domains are characterized by the fact that they reach certain thresholds of formalization and regimentation that expunge personal interest from their content, and they are to be juxtaposed to ideological formations that do not abide by these thresholds. A science becomes a science by separating itself from 'non-science', which encompasses every form of human activity that does not represent a search for objective truth, such as politics, religion and myth. To perform this deflationary program, Canguilhem introduces the term '*scientific ideology*' to describe a subset of ideological discourses that operate through the distortion of authentic scientific discourse. Thus, unlike Marx and Engels, who operated with two concepts ('science' and 'ideology') and folded one under the other, Canguilhem operates with three ('science,'

'ideology,' and 'scientific ideology') and accepts the irreducibility of scientific to ideological reason. By differentiating between a 'science' on the one hand and a 'scientific ideology' on the other, Canguilhem fulfills two different functions that cannot be satisfied (at least not simultaneously) by conventional Marxists or their critics: 1) defending the special epistemic status of scientific projects by establishing criteria that could differentiate them from other forms of social activity (like commerce, education, art, sports, etc.), and 2) developing a conceptual repertoire that can help us identify instances of abuse and pathogenesis in which a particular science becomes subject to political ends.

In *Ideology*, Canguilhem defines a 'scientific ideology' as a discourse that employs scientific means for the sake of extra-scientific ends and explains that "in a scientific ideology there is an explicit ambition to be science, in an imitation of some already constituted model of what science is"⁵. A scientific ideology, therefore, is a pantomimic discourse that presents itself as genuinely scientific but ultimately fails on two grounds. First, unlike a true science that is regimented by stringent conditions of concept-formation and concept-application, a scientific ideology treats scientific concepts as if they are context-insensitive categories and proceeds to carelessly apply them outside of their legitimate domain without justifying this cross-application. "Scientific ideology neglects the methodological requirements and operational possibilities of science in the realm of experience that it chooses to explore, but it is not ignorance and it does not scorn or repudiate the function of science. Hence scientific ideology is by no means the same thing as superstition, for ideology has its place, possibly usurped, in the realm of knowledge, not in the realm of religious belief"⁶.

Three things should be clarified here. First, for Canguilhem a scientific ideology is *scientific* only in a nominal sense because it is neither normative in content nor objective in form. Second, a scientific ideology is *ideological* in an epistemological-but-not-necessarily-explicitly-political sense. Third and finally, a scientific ideology is never

⁵Canguilhem, G (1988), *Ideology and Rationality in the History of the Life Sciences*, Cambridge, MA: MIT Press.

⁶*Ibid.*, p. 33.

internally consistent. Because there is a tension between its lofty ambitions and its lowly actuality, a scientific ideology will be to marred by internal inconsistencies that threaten to betray its 'scientific' self-understanding. These inconsistencies - which include anything from incoherent use of concepts to unwarranted inferences in scientific discourse - are visible only from the standpoint of science itself.

For the lay reader, who necessarily lacks familiarity with the methodological and technical norms that govern scientific thinking, the pronouncements of a scientific ideology will be indistinguishable from those of a well-founded science. For this reason, in order to debunk a scientific ideology, it is necessary to expose its failure to meet the appropriate methodological and epistemological thresholds of scientific rationality and highlight the concrete norms of scientific reasoning that are breached by it.

Evolutionary Psychology as a Scientific Ideology

In what follows, I advance the admittedly polemical and controversial thesis that evolutionary psychology is a contemporary scientific ideology. In my interpretation, evolutionary-psychological explanations of certain forms of human behavior (especially highly complex social behavior) are epistemologically ideological insofar as they meet the two chief identifying characteristics of a 'scientific ideology': 1) they purport to be scientific yet, 2) they hinge on a fundamentally abusive treatment of the very science they seek to emulate - namely, evolutionary biology. It must be specified that my thesis should not be taken to suggest that all research in evolutionary psychological circles is devoid of scientific value or scientific relevance. My argument, instead, is simply that there are symptomatic elements endemic to the whole field of evolutionary psychology that should make us wary about accepting many of its explanations - especially its more controversial claims about complex social behaviors - as scientifically-authorized truths about human nature given the status of available evidence and the tenuous nature of its inferences⁷. These elements, which are explored below in greater detail, include some

⁷In this sense, I echo Elisabeth Lloyd's disqualifier: "I should clarify immediately – I am not at all opposed to the application of evolutionary biology to human and animal reasoning, or to psychology more generally. Cosmides' theory and experiments are, in many ways, heading in an exciting direction; to the

of evolutionary psychology's ontological commitments (especially regarding the modularity of mind) as well as its assumptions regarding the relationship between mind and nature (especially its appeal to natural selection as the principle responsible for the generation of mental modules).

Evolutionary psychology can be defined either as a branch of evolutionary theory or most frequently, if we are to judge by the departmental affiliations of a large majority of its practitioners, as a branch of psychology. The basic premise behind it is that manifest human behavior is the result of a series of 'mental modules' that are responsible for the ways in which we process information and react to external stimuli. Somehow housed in the brain⁸, these modules are information-processing and problem-solving mechanisms that are thought to have been molded by natural selection and that we have consequently inherited from our evolutionary ancestors. According to leading evolutionary psychologists David Michael Buss and David P. Schmitt, the unifying tenet of evolutionary psychology is that "human psychology consists of a large number of functionally specialized evolved mechanisms, each sensitive to particular forms of contextual input, that get combined, coordinated, and integrated with each other and with external and internal variables to produce manifest behavior tailored to solving an array of adaptive problems"⁹.

The success and legitimacy of evolutionary psychological explanations, when cast in these general terms, depend for their success upon a series of assumptions. These are:

extent that cognitive psychology has focused on the rules of logic as the ideal form of reasoning, other, more pragmatic, social, or biological bases for reasoning have been neglected. In addition, the general move towards reuniting psychological research and explanation with evolutionary biology is undoubtedly a positive step. My criticisms in this paper reflect concerns that the claims on behalf of the evidence have been overstated, and that evolutionary standards of evidence have been neglected". See Lloyd, EA (1999), 'Evolutionary psychology: The burdens of proof', *Biology and Philosophy* 14(2), 211-233.

⁸I say 'somehow' because the explicit relationship that is supposed to exist between 'mental modules' and 'brain' is a contentious issue and no definitive answer has yet been provided by advocates of evolutionary psychology.

⁹See Buss, DM, and Schmitt, DP (2011), 'Evolutionary psychology and feminism', *Sex Roles* 64(9-10), 768-787.

1. A commitment to the ‘massive modularity of mind’ thesis. According to evolutionary psychologists, human behavior is not the result of cultural forces, or general problem-solving intelligence, or “pragmatic reasoning schemas”¹⁰ but of specialized, problem-solving mental modules that have been ‘selected for’ over the course of evolutionary time¹¹. Since this represents a positive, declarative statement about the ontology of the mind, evolutionary psychologists have given themselves the burden to prove that these ontological units (i.e. modules) exist and that they are the proper units of meaning when it comes to explaining human behavior. Thus, to justify their conclusions about the modular origin of certain human behaviors, evolutionary psychologists must either prove that the behavior in question could not be the result of a general intelligence system, or grant the inconclusive nature of their analysis.

2. The possibility of causal imputation. As mental modules are reputed to be byproducts of natural selection (usually framed as ‘adaptations’) and since, moreover, natural selection is a causal concept¹², the success of evolutionary psychological explanations is contingent upon the production of clear accounts of the module in question. Generality in this regard simply will not do. We need to know exactly what ‘solution’ evolution conjured up as a response to what ‘problem’ and we also need to know why only this solution (rather than alternate possible solutions) was selected for.

¹⁰See Lloyd, EA (1999), ‘Evolutionary psychology: The burdens of proof’, *Biology and Philosophy* 14(2), 211-233.

¹¹This argument is advanced by the leading figure in evolutionary psychology, Leda Cosmides. She writes: “The more important the adaptive problem, the more intensely selection should have specialized and improved the performance of the mechanism for solving it. Thus, the realization that the human mind evolved to accomplish adaptive ends indicates that natural selection would have produced special-purpose, domain-specific, mental algorithms – including rules of inference– for solving important and recurrent adaptive problems”. See Cosmides, L (1989), ‘The Logic of Social Exchange: Has Natural Selection Shaped How Humans Reason? Studies with the Wason Selection Task’, *Cognition* 31, 193.

¹²See Fodor, J, and Piatelli-Palmerini, M (2010), *What Darwin Got Wrong*, New York: Farrar, Straus and Giroux.

My argument is that both of these assumptions place evolutionary psychology on unstable ideological terrain since it cannot justify them from within its own conceptual armature. Let us take them in order, beginning with 'massive modularity'.

The problem with the massive modularity of mind thesis is twofold. From a philosophical standpoint, the thesis of massive modularity creates a formidable conceptual problem for evolutionary theory that is best articulated in the form of an exclusive disjunction. When it comes to modules, only one of the following claims can be logically true - either (a) there is no variation in modular processing across members of the same species (i.e. all humans have the same modules that operate in the same way), or (b) there is variation in modular processing (due perhaps to generic variance) in the population.

The First Horn – A Foray into Metaphysics

Many evolutionary psychologists opt for the first horn of the disjunction, claiming that mental modules do not vary among organisms. However, this picture of modularity raises a series of problems concerning the origin of the modules in question. A fundamental postulate of much work in evolutionary psychology (and this is part of the reason it has been so controversial) is that mental modules are identical within the species and that there is a large set of mental modules that all humans necessarily possess on account of belonging to the same species. But if modules do not vary, then how were they 'selected for' in our evolutionary past? How, in other words, could they be subject to selective pressures? One way out of this dilemma would be to make a chronological distinction and hold that modular variation existed amongst our evolutionary ancestors, but has since dropped out of the picture. The problem with this exit strategy is evident. It leads no-where. Are these modules, which presumably have some genetic basis, immune to genetic mutations? Are they immune to epigenetic changes? And, if so, what is the relationship between them and the physical structure of the brain anatomy? What would make the former vulnerable to the standard variation exhibited by the latter in the human species (either on account of genetic mutation and

selection or genetic drift or both)? The point to be made here is that there seems to be a vicious contradiction when one holds onto the belief that these modules are ‘selected for’ and holding the correlate belief that these modules are identical in all members of the species. Paradoxically, the same property (i.e. variation) needed for making sense of their existence is the same property that is denied to them by their definitional essence. In an entertaining reversal of Thomist metaphysical reasoning, it would seem as if the inner logic of evolutionary psychology leads us to the conclusion that mental modules are the only terms whose *in-existence* is entailed by their very *essence*.

The Second Horn – The Weakening of a Concept

Not all psychologists embrace the standard-based view of modules. If we simply hold, as some prominent figures in the field have¹³, that there is variation in the functioning of mental modules, then we have no reason to entertain concerns about the link between these modules and natural selection. This line of thinking, however, is not without its own shortcomings. First and foremost, if there is variation in mental mechanisms, can we still talk about the existence of modules across a population or are we forced to abandon this language all together? Suppose that an organism, A, possesses a certain mental module, M1, that enables her to process information in order to recognize attractive and wealthy members of the opposite sex for reproduction. This gives her an evolutionary advantage, which somehow passes from generation to generation. In such a case, we could say that M1 causes A to identify ‘wealthy and attractive’ for the goal of reproduction. But now imagine that another organism, B, of the same species as A, has the ‘same’ module, M1, except that in B’s case (say, due to genetic mutations) this mental schema only enables B to identify members of the opposite sex (rather than members of the opposite sex who are also wealthy and attractive). In this case, do A and B still have the ‘same’ module? Or do they possess different modules? If we say it is the same module, we are led down a rabbit hole of conceptual difficulties that would force us to defend the incoherent thesis that

¹³Cosmides and Tooby were forced to do this.

two token entities that are normally defined functionally belong to the same type in spite of performing different functions. Conversely, if we chose the line according to which A and B have different modules, then what becomes of the very notion of a 'module' as it recedes into absolute individuality? Are there as many mental modules as there are organisms in a species? If so, why not simply talk about different individual minds rather than modules? Another way of articulating this claim is to ask: At what point does variation within modules become difference between modules? Evolutionary psychology, I argue, has not matured to the point of formulating coherent answers to these questions.

But there is more. If the information-processing modules vary from person to person, important questions are raised about their efficacy *qua problem-solving adaptations*. Presumably, mental modules are hyper-specialized mental structures that emerge as a response to a highly specific evolutionary problem. This matters. Many experts in evolutionary psychology point to the remarkable specificity of these modules as evidence that they differ from any general problem-solving mechanism. But how could these hyper-specific modules work as solutions to the same evolutionary problem if they exhibit normal levels of phenotypic variation? Wouldn't variation compromise their functional efficacy? Recall the simple example from above. In organism B, M1 no longer facilitates a good solution to the specific mate selection problem of discriminating members of the opposite sex who possess two properties (attractiveness and wealth) from those who do not. Its function, due to variation, has been truncated. Importantly, the problem here is not with the existence of variation but with the hyper-specificity that is often postulated of the mechanisms. To frame the problem, one may simply recall the evolutionary mantra that specialization leads to extinction. When an adaptation is so specific, shouldn't we expect anything that varies from the 'ideal' solution (ideal here understood as the best of the existing phenotypic expressions in a population, rather than as some absolute norm of all logically possible expressions) to simply disappear over the course of time? Or shouldn't we, at the very least, expect the mechanism in question to be much less prevalent in the population?

From Evolutionary Psychology Back to Ideology

Evolutionary psychology is yet to formulate a coherent solution to these dilemmas associated with the massive modularity of mind thesis that it must, by necessity, presuppose. This is, in my interpretation, because evolutionary psychology is a 'scientific ideology' in the Canguilhemian sense. It 'aspires' to scientific status but applies the scientific concepts it uses - especially the notions of specialization and natural selection that are operative in the rational domain of evolutionary biology - in areas in which their application has not yet been justified. In the words of Elisabeth Lloyd: "Evolutionary psychologists are primarily using evolutionary theory to attempt to eliminate other competing theories within psychology, without regard to – and, in fact, in violation of – the standards of evolutionary biology"¹⁴.

It is important to note that evolutionary concepts were originally developed to explain the evolution of empirical entities whose evolution could be ascertained from the historical record. This is why debates over fossils in the 19th century were so lively - because the existence of material traces of past life-forms gave us evidence for inferring that different organic structures inhabited the planet at different points in time. Indeed, this is why many debates often hinged on the authenticity and [in]conclusiveness of fossil data. This, of course, is not to suggest that evolutionary science is entirely dependent upon the discovery of fossilized records for articulating sound hypotheses. My argument, rather, is that the domain of application of evolutionary reasoning is the realm of natural objects whose evolution can, in some way or another, be seen. Only those things that exist *in time* can be subject to evolution vis-à-vis natural selection because nature is itself temporal and because the selective pressures exerted by natural forces are creatures that act in time. This is why, to take an admittedly hyperbolic example, any evolutionary explanation of the origin of the human soul would rest on a highly problematic and fundamental category mistake - any such endeavor would seek to use a principle of nature (i.e. evolution) to explain a principle that, by its very

¹⁴Lloyd, EA (1999), 'Evolutionary psychology: The burdens of proof', *Biology and Philosophy* 14(2), p. 213.

definition, lies beyond the sphere of the natural. The soul is a metaphysical concept and, as such, its mode of existence prevents us from explaining its genesis or existence by means of natural events, natural laws and natural regularities. Assuming such things exist, souls do not evolve. They are neither in space nor in time. And since their relationship to empirical, natural human bodies is unclear, it is highly unclear how they could be subjected to the same sorts of natural laws and pressures.

In this regard, are the 'mental modules' presupposed by evolutionary psychology all that different from the human soul? Perhaps not. Of course, my position is not that evolutionary psychologists implicitly presuppose or postulate the existence of a human soul by talking about mental modules (although they sometimes come eerily close when discussion of 'human nature' emerges). Rather, my contention is that these modules and the human soul are on similar ontological footing relative to the sphere of that which is called 'natural.' Mental modules, like the soul, exist outside space and time. They are neither empirically observed nor ascertained by purely rational inference. They are metaphysical principles that are thought to somehow inhere in the brain. And, as referenced above, the nature of the module-brain relation in contemporary evolutionary psychology is no less clear than the soul-body relation in the 17th century writings of Descartes. Indeed, it is revealing that evolutionary psychologists struggle to distinguish these modules from both the physical brain and from anatomically-discernible neural networks (otherwise evolutionary psychology would reduce to evolutionary neuroanatomy and evolutionary psychologists would find themselves without a job). In the relevant literature, for all practical purposes, the information-processing modules that form the core of evolutionary psychology's ontological commitments are transcendental objects that do not exist 'in' nature. Hence the question must be asked: how can a theory of and about nature (evolution) be applied to a transcendent structure (a massively modular mind) that, by definition, escapes the bounds of all empirical reality? The answer is unclear. And in the absence of robust philosophical and methodological arguments authorizing this odd application of the empirical to the transcendental, the presumption goes against evolutionary psychology.

The shaky foundations of evolutionary psychology are reflected in the liberality of its approach to mental modules¹⁵. Surely there are mental mechanisms at play in human life whose existence it would be difficult to deny and whose evolutionary origins seem relatively well established. Mechanisms in charge of spatial intelligence, visual range, and object permanence are well documented in the literature¹⁶. But as Pankseep and Pankseep point out, the reason these examples have been compelling is because (a) they are generic enough to avoid the problem of over-specialization noted above, and (b) they are often rooted in the structure of the brain (especially the reptilian brain we share with many other creatures) and supported by empirical evidence coming from comparative neuroanatomy. The mental modules that tickle the fancy of the evolutionarily-inclined psychologist, on the other hand, lack both of these properties because all too often they are polemical, controversial and under-substantiated hypostatizations propped up by dubious logical connections and “meager”¹⁷ empirical facts. Blinded by strong adaptationist tendencies and poor ‘just-so’ causal stories (X exists therefore X was an adaptation in the past), evolutionary psychologists have ceased generating scientifically-grounded hypotheses regarding the structure of perceptual and affective experience. Instead, they construct highly tangential stories about our social lives and “entice us with the allure of much juicier emotional and motivational stories that color human life”¹⁸.

And juicy these stories are indeed! Consider, for example, an evolutionary psychology paper published by Gerianne Alexander and Melissa Hines in the prominent journal *Evolution and Human Behavior*¹⁹. In a nutshell, the authors advanced an adaptationist-evolutionary explanation of gender-differences in toy preferences and argued that these differences (i.e. girls liking pink, boys liking blue) are natural tendencies that we share with at least one other species, vervet monkeys. This

¹⁵See Panksepp, J, and Panksepp, JB (2000), ‘The Seven Sins of Evolutionary Psychology’, *Evolution and Cognition* 6(2), 108-131.

¹⁶Ibid.

¹⁷Ibid., p. 112.

¹⁸Ibid., p. 115.

¹⁹ Alexander, GM, and Hines, M (2002), ‘Sex differences in response to children’s toys in non-human primates (*Cercopithecus aethiops sabaeus*)’, *Evolution and Human Behavior* 23(6), 467-479.

preference is the product of a specialized mental module whose job it is to code toys along gender lines and to generate subjective preferences. The evidence for this claim: in one experiment, female vervets played with pink toys more than with blue ones. Aside from a series of truly egregious methodological errors²⁰, we have the usual suspects of evolutionary psychology: 1) the assumption that there is a hyper-specialized mental module whose sole function is to interpret the gender-status of toys, 2) the assumption that this mental module has an evolutionary *raison d'être* that can be articulated in a 'select for' elocution, 3) the assumption that presumed manifest behavior could not have been the result of a general intelligence mechanism, of the monkey's social intelligence or of their behavioral plasticity, and 4) the assumption that this mechanism was somehow susceptible to the influence of natural selective pressures. After a powerful point-by-point refutation of the vervet monkey study, Letitia Meynell concluded that the entire research endeavor "may simply reflect carelessness or ideology"²¹.

But is it carelessness or is it ideology? Much hinges on this question. Although there is no way to tell for sure, I am afraid that the charge of carelessness is both naive and optimistic²². Raw carelessness simply cannot explain the utter poverty of thought that is reflected in the entire experimental setting, which reflects, over and above

²⁰The authors made vervet monkeys play with a series of 'gendered' toys and then recorded the monkey's manifest behavior. The conclusion: male vervet monkeys prefer 'active' toys while female vervets prefer 'nurturing' toys. This conclusion was reached in spite of the fact that, as Letitia Meynell has pointed out in a powerful point-by-point refutation of the entire study, (1) multiple variable-control mechanisms were absent in the conduction of the experiment, (2) scientists failed to record crucial data pertaining to preference variance within the population of female vervets, (3) male vervets, by the authors' own data, actually played with 'nurturing' toys as much as they did with 'active' ones, (4) the very notion of 'gendered toys' would make no sense to a vervet monkey at, and (5) that the whole leap from vervet psychology to humans was never defended nor justified within the confines of the study. See Meynell, L (2012), 'Evolutionary Psychology, Ethology, and Essentialism (Because What They Don't Know Can Hurt Us)', *Hypatia* 27(1), 3-27.

²¹Meynell, L (2012), 'Evolutionary Psychology, Ethology, and Essentialism (Because What They Don't Know Can Hurt Us)', *Hypatia* 27(1), 3-27.

²²Presumably, the authors abided by all the appropriate rules and relevant regiments when designing and conducting their experiment. As researchers, we may take it for granted that they are committed to the soundness of their research, to the validity of their conclusions, and the soundness of their approach. No scientist wants to be held in disrepute by her or colleagues and by members of his or her scientific community. Of course, mistakes happen. And carelessness can sometimes put even scientific superstars in uncomfortable positions relative to their own research. Consider the controversy over Jane Goodall's last book.

carelessness, a sort of carefully constructed blindness to the limitations of evolutionary psychological explanations. And so, we are left with ideology as the proper *explanans*. The authors brought with them a whole constellation of expectations and prejudices regarding the nature of gender and sexual difference that inverted the order of things and made the artificial appear as natural and the derivative appear as originary. But the ideologies in the study go beyond gender and sex; they permeate the entire logic of the argument and disclose the fundamental abuse of biological reasoning that is all too often found in evolutionary psychology, which is itself a 'scientific ideology.' It is a discourse that masquerades itself as scientific by borrowing the language of a legitimate science (evolutionary biology) but that applies these concepts and principles to a domain of objects that is alien to the science being pantomimed. It thus exhibits a high degree of carelessness, but carelessness not in sustaining its own scientific image but in respecting the narrow domain of applicability of the concepts it appropriates.

The lack of scientific grounding behind so many of its 'juicy stories' is the reason why evolutionary psychology may end up, so to speak, stewing in its own juices. As these stories continue to propagate both in popular scientific writing and in professional journals, an ideological operation is taking place that must not go unnoticed; many aspects of human behavior that we have no reason to suspect are natural and that may well be nothing more than the byproducts of social convention (i.e. baby girl's preferences for pink pots) are being unquestionably and uncritically naturalized. This naturalizing procedure is dangerous not only because it is produced by below-par reasoning that acquires epistemic authority in the eye of the larger public, but also because it unfolds in a saturated social context, in which the naturalization of social norms has significant ethical, political and epistemological consequences²³.

²³For example, Letitia Meynell concludes her article on the vervet monkey study by arguing that the naturalization of gender psychology is not an innocent scientific pursuit. Often, it not only is buttressed by, but also buttresses, political ideologies about what men and women want. Men want sex, so we rape. Women want nurturing, so they get raped. These ideologies, she continues, are then reflected back to us in our social institutions, in the ways in which we organize social spaces such as military, sports and the classroom.

Conclusion

The study of the human mind can benefit from evolutionary accounts of human cognition and even from psychological theories regarding the functioning of the human psyche. But these benefits must be accepted on conditional terms - that is, on the condition that one need not, in appropriating evolutionary or psychological conclusions, be committed to an *evolutionary psychological* understand of the mind. Moreover, it is crucial that, as philosophers, we not only take but also give. It is not enough for philosophers to sit back and receive ready-made conclusions about the nature of the mind from the natural sciences, especially when there are unrecognized philosophical posturing moves in these scientific disciplines. Philosophers must make critical interventions into the discourses of the sciences and highlight the ways in which certain aspects of scientific discourse (such as the equation of mind and brain) remain open questions, at least from a philosophical standpoint.