

DARWINIANS OF THE SOUL¹

Csaba PLÉH*

Abstract

The paper gives a concise summary of the recent upsurge of evolutionary ideas in psychology. It starts from a comparison of two attitudes regarding this trend. Radical evolutionary psychology represented by authors like Cosmides, Tooby and Pinker conceptualizes the human mind as being entirely modular and the different modules all have an adaptationist explanation. The other approach that could be labeled as the evolutionary attitude in psychology is softer, postulates interactions among the different mental subsystems and takes a broader comparative view. The paper surveys the evolutionary ideas applied to prehistory, specifically the theory proposed by Merlin Donald regarding the communicative buildup of the modern mind from earlier communicative systems.

“If we’re all Darwinians what’s the fuss about?” – this famous title of Symons (1987) originally proposed in connection to the application of evolutionary arguments to the study of behavior does carry a relevant message to the recent evolutionary applications of psychology as well. The careful reader is able to notice how many different approaches to evolutionary psychology exist today. This is true of the international scene, but it is also present in Hungary as well, as the Hungarian volumes edited by Pléh, Csányi & Bereczkei (2001) and by Pléh (2002) show in their variety of approaches. There are certainly many possibilities today to be a Darwinian. Nemes and Molnár as well as Bereczkei (2000) indicate that there are basically two interpretations of the term *evolutionary psychology* that became fashionable in the past fifteen years. One is the view of a peculiar school that is headed by Cosmides and Tooby, introduced first in their reader (Barkow *et al.* 1992) but outlined in many other publications, including those where a connection is proposed between modular brain organization and mosaic-like selective adaptations for different cognitive domains and functions (Tooby & Cosmides 2000; Duchaine *et al.* 2001). The challenging aspect of this particular vision, let it be called as the standard view of Evolutionary Psychology or EP, is that it ties a peculiar interpretation of Darwin to computational, mechanical, or algorithmic

concepts. In a *pars pro toto* way it advocates itself as the only possible Darwinian psychology. Even in its non-computational interpretations, it certainly is an ultradarwinian approach in the sense that it intends to explain every aspect of the architecture of the mind by selective and specific adaptation processes as presented by David, the leading advocate of this reproductive selection theory for cognition (Buss 1994, 1999).

The other approach is softer and at the same time broader. Let us call this more comprehensive approach Evolutionary Attitude or EA. This approach is trying to be a protagonist of Darwinian thinking in any field of psychology as represented most clearly by the textbook of Gaulin & McBurney (2001), who try to present “general psychology” as seen from the perspective of evolution. This view can be interpreted to be more generous both from a historical and from a contemporary point of view. It establishes a continuity between the numerous Darwinian ideas that arose in psychology, such as the functionalism of the late 19th century, comparative psychology with its tradition over a hundred years, the evolutionary epistemology proposed by the followers of Karl Popper (Campbell 1974) on the one hand, and our current evolutionary concepts on the other hand. The difference between the present situation and the situation many decades ago is not to be

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* Center for Cognitive Science, Budapest University of Technology and Economics, pleh@itm.bme.hu.

found in our questions (our curiosity about whether animals can think existed 120 years ago as well as today), but in the greater data sets and the more sophisticated methods available (for some of these comparisons see Pléh 1999).

For a redefinition of psychological issues in an evolutionary framework, great help was received from researches carried out in experimental cognitive psychology that lead to a better understanding of the inner world of the human mind. We know better today what it is exactly that we have to explain. Another factor was the emancipation of human ethology (for a Hungarian overview see Csányi 1999), along with the discussions concerning sociobiology (see for example the volume edited by Crawford *et al.* 1987). The differences and continuities between sociobiology and evolutionary psychology are not all that trivial as one sometimes feels. EP is a new vision compared to sociobiology since it deals with the inner world (treating the psychological side as belonging to the proximal stage of explanation in the sense of Mayr 1982), and takes the results and methods of experimental psychology into serious consideration, which is a big change compared to the attitude of sociobiology which had the tendency to treat the mental realm as an epiphenomenon. The change is not only flirting with the permissible vanity of psychologists but broadens the levels to be considered in interpreting behavior.

As far as the past of evolutionary psychology and evolutionary attitude is concerned, Hungarian psychology boasts with a long and great theoretical and experimental background. Paul Harkai Schiller, mostly known in the Western literature as Paul von Schiller, was looking for analogies between the teleology in the behavior of animals and human purposeful behavior in the 1930s and 40s. He tried to construct an intentionality-based, ethologically inspired theory of complex animal and human behavior, proposing a function-based unified psychology where biology and sign-related behavior would go together (Schiller 1947). He also tried to extend the application of this holistic attitude to the animal mind in experiments on detour behavior (Schiller 1948, 1950), and to the analysis of figural preferences and drawings by apes (Schiller 1951, 1952). Lajos Kardos

(1980, 1988) established another tradition. He proposed a general theory of the genesis of the mind, maintaining that mental organization gradually evolves as a consequence of predictive information available in stimulus arrays. In his experimental research continued over three decades, he analysed the relationships between spatial orientation and lifestyle and memory systems in rodents, calling for memory maps of a more concrete visual nature than the cognitive maps proposed by Tolman (1948). The continuity of this comparative approach is shown in the work of Magda L. Marton (1970, 2000), firmly based in her experiments on the role of the body schema of primates in the evolution of the self.

Some of the authors in Pléh 2002 surveying present day Hungarian evolutionary psychology – Nemes and Molnár, Bereczkei – would rather replace the parochialism of mainstream EP with a comparative psychological perspective and would try to continue this tradition. We should be aware of the fact, however, that concentrating on humans – that is implied by many to be a limitation of EP – is not a defect of evolutionary psychology. It deals with humans primarily not because of narrow-mindedness but rather because it seeks answers to questions that are inherently connected to the human condition (why are we jealous, how do we see colours, why are there so many languages, what is the origin, function and role of personality differences, etc.). Ilona Kovács in Pléh 2002 as well as in her other works (Kovács 2000, Kovács *et al.* 1996) follows this line of investigation when she looks for structural homologies between perception and animal memory. According to her view, the mammal nervous system tries to avoid both the impossibility to localise two objects in the same place and that of contradictory internal experiences. Here we see a continuity between the traditional comparative questions and current investigations in evolutionary psychology and cognitive psychology of visual experience.

Many central questions of the leading psychological theories are shown in a different, evolutionary light in the framework of the new evolutionary psychologies. Table 1 shows some features of the two frameworks mentioned above.

Table 1. Two approaches on the application of evolutionary ideas to psychology.

Issues	Evolutionary psychology (EP)	Evolutionary attitude (EA)
Adaptationism	Every mental feature is an adaptation	Both adaptations and exaptations
Architecture of the mind	Entirely modular	Modules and general cognition
Determinant features	Early environment, Pleistocene mind	Epigenetic programs, interactions
Concentration	Sexual attraction, motivation	All of human psychology
Computation	Adaptations as programs	Not relevant

The construction of the mind

EP, as shown quite critically by Nemes and Molnár or Kamps, is based on the “Swiss army knife” model of mental structure. This is a radically modular view that postulates that the human mind is a series of independently evolved and autonomously functioning adaptations. This view has to face many criticisms, both on conceptual and on experimental grounds. Even the creator of this modern age modularity concept, Fodor (1983, 2000), also emphasizes in his new book that we have to keep the duality of specialized and general problem-solving modules to have a rational animal.

However, the radical modular view of EP is far too easy a prey. One should not forget that even though it has many conceptual weaknesses as a concept of mental development (for a detailed discussion see Karmiloff-Smith 1992), at the same time this radically innatist modular concept is incredibly fertile from the point of view of the sociology of investigations. This analytic, as they say, domain-specific view considers all our cognitive devices to be inborn. It starts from some unquestionable facts like the apparent wisdom of infants to uncover language structure. It is, however, generalizing this attitude, claiming that in all areas we have very strictly constrained specific knowledge types that are selected by evolution. This attitude certainly enriched the data base on human infant development. Even the critics of domain specificity and nativism

like Elman *et al.* (1996) start from a reanalysis of the facts that were obtained by people in the nativist camp. (For a survey of their findings and approach see Hirschfeld & Gelman 1994.) The experimental critics like Elman *et al.* are able to step on stage advocating plasticity and transfer between systems only because somebody had already stated and established the radical and simple-minded modular view. Thus the radical conception so difficult to retain proved to be an excellent intellectual compass to the fertile lands of investigation.

In fact, the issue of mental architecture and modular organization comes up along lines similar to issues of epigenesis regarding the prehistory of the mind as well.

Ideas on the historical genesis of the human mind

In present-day evolutionary speculations, strong proposals are made about the cognitive changes implied in anthropogenesis. In these theories it is assumed that some relatively stable processing modes that are invariable across cultures do exist, and only some parts of the entire architecture are under the influence of cultural domains. The evolutionary process would explain those aspects of architecture that were formed in a slow, piecemeal Darwinian manner as contrasted to sudden, cultural changes. These are strong biological architectures, and culture has an impact only on the higher, output levels of these computations and cannot rewrite everything.

Table 2. Characterization of two types of mental architecture.

Primitive architecture	Culture, modern architecture
Evolved	Unbound
Fixed	Flexible
Fast (seconds, minutes)	Slow (minutes, hours, years)
Formed over millions of years	Centuries, decades

The formation of these universal mental architectures – during an evolutionary process – could be summarized according to critical stages of hominid evolution. One of the most comprehensive modern proposals encompassing biologically given architectures and at the same time emphasizing the formative influence of culture has been made by Merlin Donald (1991, 2001). The unique feature of his approach is that Donald assumes *correspond-*

ences between communication and representation, external and internal worlds. Neuro-psychological changes in brain organization during hominid evolution, changes in internal representation and changes in the field of communication and economy in memory go hand in hand in creating what he calls the modern human mind. Table 3. gives a summary of his views.

Table 3. Donald's conception on changes in systems of representations and cultures

Culture	Species, age	Memory organization	Transmission
Episodic	apes, 5 myr	Episodic events	none
Mimetic	Homo erectus, 1.5 myr	body representation social enactment	enactment, imitation
Mythical	Homo sapiens sapiens, 100–50 kyr	Linguistic semantics	Myths, narrative knowledge and transmission
Modern	modern humans, 10 kyr	External storage Hierarchical store	Fixed knowledge External authority

Donald outlines a brave conception on changes in representational systems during anthropogenesis. In hominid evolution there are special adaptations he calls “cultures”. The essence of the three special systems of representation is a different organization and transmission of knowledge. The stage that preceded these changes is the episodic; stimulus and experience-bound organization is basically shared by humans and apes. The primate mind is characterized by episodic culture. In episodic culture knowledge is always personal and contextualized. The real human change appeared with the advent of a social semantics with shared knowledge that allowed our ancestors to overcome the limitations of the solipsistic mind.

Mimetic culture was the first social system of knowledge, much preceding natural language, appearing about 1.5 million years ago. It established a world of intentional representations through the body, entailing an open generative system with communicative intentions of a referential nature, using internally reproduced representations. Its domain is visual and motoric, involving besides hand gestures the use of body posture and facial expressions. Its neurological precondition is a relatively precise representation of the body and the outputs of the episodic system.

Regarding cognitive architecture, mimetic culture implies a more precise control over our

own body, the executive functions being able to “turn inward” as well. This means that the perceptual world and the mind of the primates were replaced in early hominids by an action-oriented world, making action the object of tradition.

From then on, concepts become shared and distributed. Social play, organized teaching systems of transmission are born, as well as coordination through communication and joint representations, like in social hunting.

Mimetic culture at the same time was very conservative and slowly changing. The reason for this was that mimetic culture always required an episodic anchoring, its contents being provided by contextually-bound episodic knowledge.

A language based on sound manipulation also implies a culture characterized by faster social changes. Donald refers to this as *mythical culture* due to the prevalence of narrative language use in the early stages. The dominant new organization of knowledge is through action and protagonist-oriented narratives. Integrative myths of a group are an outgrowth of narrative patterns. Narratives are essential for change as well. “On a cultural level, language is not about inventing words. Languages are invented on the level of narrative, by collectivities of conscious intellects.” (Donald 2001: 292)

The third stage was established by the formation of a theoretical culture that involves the discovery of external storage mechanisms. Writing embodied this external storage space. In episodic, mimetic and mythical cultures, knowledge was basically represented in the brain of an individual, though regarding their origins in language-based (mythical) culture, they certainly were of a distributed social nature. With the advent of writing they become social systems independent of us, thus establishing a division of labor between our own working memory system and the external supporting memories. External memory can be realized in many physical forms, it is unbound, stable and in principle always accessible. This *in principle* is of course questioned by the long stories of sacred knowledge, censorship and

the like, and in a way the modern network-based knowledge carriers are in fact suggesting that network-based knowledge provides for real constant accessibility. But compared to our individual brains, books are certainly a more accessible system. Writing creates a system that with the new organization of knowledge leads to new epistemologies and visions of knowledge in general (Nyíri 1992). From then on we can talk about a symbolic theoretical culture that shall become the main governing principle of formal education with the image of a noetic system that has an independent existence. According to Donald, our mental apparatus is relieved from overload due to writing: on any given occasion, sometimes it only has to contain some arrows pointing to relevant external memories, and sometimes the written “frame” as an external aid has allusions to internally stored locations.

Representational changes are the moments that allow us to understand the relations between brain reorganization and hominid evolution better. According to this vision, “We are a culturally bound species and live in a symbiosis with our collective creation. We seek culture, as birds seek the air. In return, culture shapes our minds, as a sculptor shapes clay” (Donald 2001, 300). This creates a peculiar bridge between biology and culture.

The four cultures according to Donald do not replace each other but create inclusive relations. It is this inclusiveness that leads to a new kind of consciousness, self organization and creativity in communicative and representational systems. Creativity, as it was emphasized by many, is the ability to overhear between otherwise separated systems. In the framework put forward by Donald, this appears as the option provided by mentally co-existing cultures.

There are several attempts regarding anthropogenesis as well that try to overcome the fixed, modular nature of the mind by emphasizing flexibility and representational cross-talk in a similar way that is proposed by Karmiloff-Smith (1992) for development. Steven Mithen (1996) claims that the human mind is characterized by a cross-talk between very general types of originally isolated,

modular intelligences, such as social, technical, naturalistic and communicative intelligence. The mythologies e.g. show a cross-talk between human and natural intelligence by treating animals as humans. Group stereotypes would act the reverse way by treating humans as animals. In short, most of what is studied about the creativity of human culture is treated by him as the special human feature that the development of special modules in hominid evolution was followed by in the last stages with a cross-modular representational system.

Elementary sociality as an evolutionary issue

The evolution of social interactions are of a central importance in present day EP when talking about the peculiarities of the architecture of the human mind. In fact, the different proposals regarding some kind of elementary biological sociality are proposed as important bridges between biological and cultural psychology (Tomasello 1999), or between biological and social determinism. In this regard, present-day EP and EA are taking up the traditional biology-culture continuity issue characterizing the debates of the late nineteenth century.

According to Donald, the peculiarly human development leads to the birth of *hybrid minds* who live in *cognitive communities*. “The evolutionary origins of language are tied to the early emergence of knowledge networks, feeling networks and memory networks, all of which form the cognitive heart of culture. Language was undoubtedly produced by Darwinian selection, but evolved indirectly, under conditions that favored those hominids who could make their shared cognitive networks more and more precise. ... [the] emergence of language could not have initially been an end in itself ... The first priority was not to speak, use words or develop grammars. It was to bind as a group, to learn to share attention and set up the social pattern that would sustain such sharing and bonding in the species. ... The great divide in human evolution was not language, but the formation of cognitive communities in the first place. Symbolic cognition could not spontaneously self-generate until those communities were a reality. This reverses the standard order of succession, pla-

cing cultural evolution first, and language second.” (Donald 2001, 253).

This sets the framework for the development of symbolic communities. However, for evolutionary psychologists there is a need to explain the emergence of a socially tuned individual mind. The general mood was set in biological terms by Nicholas Humphrey (1976), claiming that the minds of all primates and consequently of humans evolved primarily under the requirements of social pressure, and that the original function of intellect was to give orientation in social life, either in a positive way, via empathy and similar functions, or in a negative way, by means of manipulation, by development of what is called today a Machiavellian intelligence (Byrne & Whiten 1988). When referring to apes, some researchers go as far as talking about them as “natural psychologists” (Humphrey 1980), and others claim that language and learning, the foundations of human culture, are based on the need to decode the intentions and thoughts of others (Tomasello 1999). Current evolutionary psychology is a continuation of this ethological view, and so is cognitive psychology. Nemes and Molnár claim that sociality is the field where evolutionary and cognitive views could really meet.

An interesting question for believers of EP is to explain in a modular frame when does a human infant show signs of having a “theory of mind”, this peculiar knowledge of “the other mind” emphasized by philosophers of cognition. Baron-Cohen *et al.* (2000) in their study show the broad implications of this issue, from ape intelligence through child development and autism to the development of prefrontal functions in humans. One of the key debates here is up to what point can a theory of the mind be considered as a self-contained system that has its own autonomous development? Evolutionary science headquarters are quite divided concerning this question. The scale ranges from “theories” that attribute a naive theory that is like scientific theories to the human child to views and concepts about emulation and imitation, and starting off from first person knowledge.

The publications of Csibra and Gergely (see e.g. Gergely & Csibra 1997, Gergely,

Nádasdy, Csibra & Bíró 1995, Csibra & Gergely 1998, Csibra *et al.* 1999) show clearly the fertility of modularity theory as a starting point. Their much cited experiments – apart from being in line with the investigations about “knowledgeable infants” – also show how an apparently dry philosophical theory can become a generous inspirator for cognitive research. Formerly, they dedicated themselves to show that an infant is capable of taking up or assuming an intentional stance that was proposed by Dennett (1987). According to their recent work, however, this is preceded by a purely teleological knowledge in infants as young as 6 months of age. Csibra and Gergely also show the further steps that lead children towards a fuller theory of mind that projects thoughts and intentions into the others. The studies of Györi, another investigator who sees this as a key issue, take us to the field of applied evolutionary psychology. Currently the most widely investigated generic developmental disorder of the mind, autism provides us with an opportunity to put our views about the theory of mind to a test (see again Baron-Cohen *et al.* 2000). Can autists be simply characterized by mind-blindedness? This would support the idea of a naive psychological mind-reader module as an independent adaptation in the eyes of a modular theorist. Or is this peculiar disorder a malfunction of general executive functions, which therefore fails to connect ideas to each other? The study of Györi is a good example that our theories about the entire mental architecture can be used as a leading compass in the labyrinth of applied questions of research on developmental disorders.

Evolutionary ideas about human sociality show up in other clinical fields as well. The investigations of Péley analyzing attachment processes in troubled adolescents show that if we take an evolutionary point of view it is possible to cram into our vision both the “hard” biological and the “soft” biographical narrative facts when it comes to explaining individual differences and pathologies.

Body-mind relationship and evolutionism

Contemporary psychology, if it is at all valid to use such a generalizing expression nowadays,

is an heir to the functionalism originally created by Aristotle, and later revised by Ryle (1949) and other evolutionists, by the Hungarian (Harkai) Schiller (1947). In this broad functionalist view, mind is the form of matter, that is to say, mental processes do not articulate an independent level above material processes in the brain. The later cognitive interpretation of this notion proposed that mental processes are always realized by a material system, yet they are not identical to it. This program of research in its cognitive version of functionalism was on the peak of its success at the end of the seventies (see the reader edited by Ned Block 1980 to this effect). Not only did it revive an ancient philosophical heritage, it also gave faith to the autonomous investigation of the inner world. As Nemes and Molnár, Bereczkei and Kampis (2001) clearly show, this program has faded by now. The development of neuroscience and evolutionary thinking once again gives a leading role to investigating the relationships between mental structure, material implementation and the evolutionary origin of the system. Keeping the virtues of this sterile functionalism, our task today is to find a place for the mind in the system of proximal and distal explanations of biology, as systematized by Mayr (1982). Meanwhile, classical issues of psychology, such as the status of causal models and determinism are being rephrased in this frame in a new way. This is a critical point where evolutionary psychology and sociobiology diverge. Sociobiology – like eliminative materialism (Churchland 1981, 1986) – tended to treat them as concepts like the ones cultivated in astrology, to be eliminated as neuroscience and evolutionary theory progress. EP, however, considers psychological proximal causes as real and existing entities again. The redefinition emphasized by EP and EA has two new aspects. On the one hand, as it is emphasized by Nemes and Molnár and Péley, the epigenetic tuning, i.e. the role of experience in stabilizing these adaptive characteristics in the behaving individual becomes important, as opposed to simple genetic determinism. On the other hand, this new view seeks a harmony between neurobiological and evolutionary explanations. The original proposition of Kampis (2001) to consider the body as a model for the cognitive system, and the union of corporal

phenomenology and evolutionary thinking are good examples of the renewal of concepts that the application of the evolutionary frame brings about. Szathmáry in Pléh 2002 as well as elsewhere (Szathmáry 2001) concerning the beginnings of language shows that the human cortical system developed a new, more dynamic (amoeba-like) localization principle as opposed to static modular conceptions about cortical architecture. At the same time, he stresses most markedly the importance of understanding the co-evolutionary processes between social structures and the evolution of the brain. In general, language as a human neo-formation is the clearest case where the alliance between the proximal, neuroscience-based and distal, evolutionary considerations becomes the most articulated (see e.g. Jackendoff 1999).

The question of ultraadaptationalism

Evolutionary psychology revives the interest in the issue of explanatory frames for mental phenomena as it has been shown already by the considerations over body-mind relations. Explanation through development is restored to its former glory. This also gives more weight to consider the individual epigenesis as an important factor as well. It is also becoming a respected and interesting question again what is the relationship between evolutionary prehistory, advocated by EP, and “real history”. In the resolution of this particular query, narrative theories might have a central role. There are some avant-garde efforts to create this connection. One of them is the conception of Donald (1991, 2001) already analyzed. For him, the key to continuity between prehistory and history is the fact that the crucial moments are always corollary changes in mental representation and communication tools in the construction of the human mind.

One of the central issues of the quest of this explanation is whether every single architectural feature of thought, experience or perception is a result of specific adaptations. EP advocates this view. Modular conception and selection go hand in hand: we are the way we are because we were selected to be this way. This theory is represented not only by people like Buss (1999), but by philosophers like Dennett

(1995) as well. Criticisms arise from many quarters, claiming that this is a single-minded view of human nature. The source of criticism is the general utilitarian principle. As Fodor (1998, 211) puts it: “Psychological Darwinism is a kind of conspiracy theory; that is, it explains behavior by imputing an interest ... that the agent of the behavior does not acknowledge”. A way out of this can be the acceptance of the possibility of evolutionary by-products (exaptations), as proposed by Gould & Lewontin (1979, Gould & Vrba 1982). Some particularly human features leading to culture can be by-products of structural processes or exaptations of selective forces that acted on some other feature. Another option could be formulated by the assumptions regarding different levels of selection and postulating group selection, as done by Csányi (1999) among others. Eventually, all of this comes to be related to the issue of the relationship between culture and selection: how does the emergence of culture affect general (somatic) selective processes? This was already asked more than a hundred years ago. Today we add a further query: what was the role of selection in the evolution of apparently universal cultural patterns?

The importance and origin of being different

It is a key issue in all theories of psychology how they provide for diversity amidst their tools for looking for universal mechanisms. A model based on Darwinist selection via postulating variability promises a firm base to theories of individual differences. For psychologists this stands out most clearly in two fields:

- I. The origin and nature of *individual differences*. Györi presents a psychological model on a peculiar population: radical differences are explained in terms of modularity in the literature on autism. The massive diversity in similar conditions seems to support independent adaptations. Péley on the other hand emphasizes that a fine tuning over the individual lifespan of these adaptations is also required. We all prepare our biographical narratives (i.e. adaptations), but the content of this and the power of destiny in turn is already a question of the contingent facts of our life. Thus there

are hard and soft evolutionary models of individual variability.

- II. *Variability of cultures.* From the beginnings of modern anthropology we live with a certain anxiety in our mind: if all we have are adaptations, how do we explain cultural diversity? The solution of current social sciences (heavily criticized by EP, e.g. Pinker 1997) is that this diversity shows precisely that there is nothing to be explained in terms of evolution within the domain of culture. Hernadi (1995) and Péley in Pléh 2002 point out that today there is quite a lot of uncertainty here. On the one hand culture – by influencing our own domain of possible choices – creates a new space of dynamics, which, according to classical ethology, is the most important niche where species-specific behavior is molded and formed. On the other hand, evolution is treated by many people favoring EA not as the opposite of culture, but the condition to create a culture. Culture is constructed, but the ability to construct it is of an evolutionary origin (Tomasello 1999). And this seems to be the most important message of recent evolutionary psychology for the human and social sciences.

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