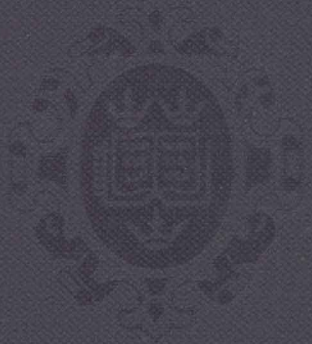
Consciousness in Contemporary Science

Edited by

A. J. MARCEL and E. BISIACH



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A cautious welcome: an introduction and guide to the book

Anthony J. Marcel and Edoardo Bisiach

Difficult returns

When someone returns after an absence, their home-coming is not always straightforward nor their acceptance always universal. Three stories illustrate different aspects of this.

In sixteenth-century France, a young peasant called Martin Guerre, not long married, quite suddenly left home. Some years later a man came to the village claiming to be Martin. The wife, tentative at first, accepted him and came to love him, as did many of the villagers. However, family disputes led to a judicial examination of whether the pretender was in fact who he claimed to be. Despite the fact that the man was appreciated by many for his various qualities, the official issue of his identity, for administrative and financial purposes, could not be ignored.

In the biblical story of the prodigal son, different issues are at stake. For the father, the pleasure at the return of the prodigal to the fold outweighed the satisfaction derived from the constancy of the son who had stayed. Naturally, the dutiful son resented the welcome given to his prodigal brother and the lack of appreciation of his own less glamorous deeds.

Our third story concerns the arrival in Mexico of Cortes. It was taken by many Aztecs to be the return of Quetzalcoatl. But it is said that some dared to voice the suspicion that Quetzalcoatl could not return since he had never even existed, was just a myth. The very idea of a serpent with feathers showed what an incoherent myth it was. However, yet others, especially some thoughtful Spaniards (anticipating Pirandello?), suggested that if something is believed to be the case, well, in some sense it *is* the case.

As we shall see below, the attitudes in these three stories seem to apply to the reception given to the return of consciousness to the fold of psychology, though in this case our own predecessors had banished the

rascal. As in our first story, there are those who either like or dislike the character, irrespective of his[1] name, while others are concerned that the name and the appropriate identity should fit. Sometimes this is for legislative reasons, and sometimes because people do not want to be fooled. As in our second story, when people know only too well who the home-comer is, some positively welcome him with all his drawbacks, either glad to have him back or seeing that he can be set some useful jobs. Others are suspicious of his slipperiness and prodigality, either thinking that they can do perfectly well without him or willing to accept him only if he gives up some of his personality, the bit that to others made him charming. As in our third story, there are those who want back something that they have never known and are duped by a newcomer. If they are not duped, they either reject the interloper, or accept him as hard reality or as the best that can be had. Some of these may think there was never any substance to what they had yearned for. Others suggest that thinking makes it so. There really are a lot of different people at the reception. Who is knocking at the door?

The problems

In recent years, after an absence of over half a century, there has been a growing revival of interest in consciousness among psychologists, philosophers, neuroscientists, social scientists, and clinicians in North America and Western Europe. Of course it has never been entirely absent, being part of the theoretical vocabulary of the psychoanalytic tradition, part of the approach of Vygotsky and Luria, and a focus of interest for philosophers and social scientists outside the natural science framework. It is however only within the last fifteen years or so that mainstream students in the disciplines mentioned above have had increasing recourse to the term. It is significant that Mandler in 1975 entitled a paper 'Consciousness: respectable, useful and probably necessary'. He was responding to the predominant assumption that consciousness is none of these.

The current interest has been both in consciousness as a proper topic of study and in its explanatory use. Although the reasons for this revival of interest have been diverse, some can reasonably be identified. First, in the reaction against behaviourism, psychologists have been more confident in their use of people's experience, realizing not only that it helps

[1] In the text, where pronominal reference is made to unspecified individuals, masculine pronouns (*he, his*) are used in most cases. Readers should take such instances to imply both masculine and feminine forms.

them generate explanations, but that much of what they study is indeed that experience (in perception, emotion, memory, and thought). Certain aspects of consciousness such as imagery, dreaming and the stream of thought have become fields of study in their own right. Second, certain phenomena in normal people (attention, slips of action, perception without awareness) and in clinical syndromes (blindsight, amnesia, neglect, split brains, multiple personality) have encouraged many investigators to use the concept of consciousness as a descriptive and explanatory term. Indeed philosophers of science accord special status to some of these latter phenomena, as data which 'denormalize' a previously widely held explanatory framework.

However, both the use of the term and the status of the concept remain unclear and inconsistent. Natsoulas (1978) distinguished seven conceptual uses of the term consciousness, and it is not difficult to find additional usages. One reason for this is that, like many terms in psychology, the word pre-exists scientific terminology in natural language usage. This is much less so in physics. Hence there is much more agreement on the concept of a quark. However, if one examines the history of physics, at several times of paradigm change concepts were unstable. Not only do meanings change over time, but people do not use language by consulting a dictionary (even if they did they would find the term 'consciousness' to be polysemous). Further, scientists, certainly psychologists, tend to use terms according to what they are trying to explain. This difference in usage can be seen in this book (although most of the authors make an attempt to specify what they are referring to). Sometimes it can be depressingly amusing to see scientists legislating on what is meant by a word. It is such polysemy that leads Wilkes (this volume) to scepticism over the scientific status of the term 'consciousness'. However, whether the various referents of a term form a 'natural kind' and whether each of those referents is a valid topic for science are separate issues.

A particular problem is the domain or level of discourse in which the concept is being located. Sometimes the term appears to be used in a functionalist way, so that it is equivalent to concepts such as attention, short-term memory, representation, control, or what people can assert verbally (concepts which themselves are often unclear). At other times it is used to refer to phenomenological concepts, such as subjective experience, qualia, the contents of awareness, intentionality, or personal unity. (Phenomenology is not being used here in its technical, e.g. Husserlian, sense.) Furthermore, the very relationships between descriptions and explanations in phenomenological terms and in functional (e.g. information-processing) terms remain problematic and are in need of scrutiny. The problem of level of discourse is even more obvious

when it concerns neuroscientists. They often have occasion to explain one level in terms of another and even use terms from the two levels interchangeably. Legislation is seldom of use to science, but we appear to need some clarification.

The issue of the status of consciousness is largely what has attracted the scientific censor's blue pencil, and is still a matter of dispute among philosophers and psychologists. As regards phenomenal experience, the censor's argument has been not so much that of radical behaviourism, that phenomenal experience is mentalist, but rather that its essential privacy and 'subjectivity' debars it from science. Yet clearly, psychologists and sociologists use reports of such experience not only to help frame hypotheses but also as data. In the former case, perhaps this is just an example of the scientist ultimately relying on at least some tools and heuristics outside the formal practice. But protocol analysts such as Ericsson and Simon (1984) have argued that introspection is a perfectly legitimate and valid tool that ought to be recognized as such. In the latter case, when phenomenal experience is used as data, the problem of status is more acute. Many psychologists treat such reports as informationally equivalent (Simon 1978) to some functionalist internal representation. But it is not clear that this is legitimate, especially if the report is a translation or if it is a description expressing only part of the representation. Additionally, if the report is to be treated as conveying a person's putative phenomenal experience, and if it turns out that isomorphic equivalence with the functionalist counterpart breaks down, then the problem of validity raises its head. It has been suggested by Dennett (1982) that these problems are not real, and even that phenomenal experience, as we conceive of it (though even that is unclear), does not exist (see Dennett, this volume).

These problems can be illustrated by considering how we regard our answers to certain types of question. If we are asked for our telephone number, we usually respond quite quickly with the digits and we have little experience of the information until we say it. The same is true if we are asked if we know any buildings in a well-known place (e.g. Trafalgar Square), especially when a quick reply is required. But if the request is for more detailed information, such as the spatial arrangement of the buildings, or as full a list as possible, or if the request is for spatial information, such as whether the 'toe' of the map of Italy faces east or west, then our experience of our answer is usually rather different. We may experience an image before we answer, we may even feel that we cannot answer *unless* we can experience the image, and we may feel that our answer is a 'description' of what we experience. Now how should the psychologist regard the relation of the answer to the knowledge which it conveys? Is the answer just a response to a specific

stimulus? Is it intentional[2] (i.e. is the utterance 'about' something), and if so is it the verbal expression of an informationally equivalent representation of knowledge, which is independent of phenomenology? Or is the answer in some real sense a description? If it is a description, what is it a description of: of what the question referred to (the map), of knowledge, or of the phenomenal experience?

The answers to such questions and the appropriate level of discourse depend on one another. If one wants to treat the answer as a description, then one cannot treat what is described *purely* as a brain state, though it corresponds to one. But is one forced to go beyond the functionalist level to the phenomenological? Essentially the same issues arise when trying to decide on the status of phenomenal reports.

The meeting and the book

This book arises out of a meeting which was convened to make explicit the issues mentioned above and to discuss them. The meeting was held at the Villa Olmo, on the shore of Lake Como, in April 1985[3]. The motivations for the meeting determined and constrained what this book contains, and, indeed, what it omits. The contents are both wide and narrow. They are wide in the sense of the considerations, data, and approaches represented and discussed by the contributors: information-processing approaches to perception, action, and attention; neuropsychological approaches to blindsight, neglect, amnesia, and split-brain syndromes; social and psychodynamic approaches to meaning, memory, the self-concept, and learning; computational approaches; philosophy of science and philosophy of mind.

[2] A problem arises with the spelling of the term *intention/al/ity*. There are in fact three terms.
(a) The term which refers to 'the sum of attributes or objects comprehended in a concept or set', and is the opposite of its extension (the range or enumeration of objects), is *intension* and is always spelt with an *s*.
(b) The term which refers to a goal or purpose that is explicitly represented is *intention* and is always spelt with a *t*.
(c) The term which refers to content, reference, or indication – what something is about – is sometimes spelt with a *t* (*intention*) and sometimes with an *s* (*intension*). The spelling convention is partly a North American versus British matter.

In this book the first usage does not occur. Both of the latter usages are spelt with a *t* – (*intention/al/ity*). In individual chapters authors have made it quite clear in which sense they are using the term. In the subject index entries are listed under two headings (i) 'Intention – aboutness', and (ii) 'Intention – goal'.

[3] Two of the contributors (RVG and KVW) were not present at the Villa Olmo. Their chapters were originally delivered as papers at a symposium at Bielefeld, F.R.G., organized by Philip Smith and Peter Bieri, to whom we are most grateful for consenting to the inclusion of revised versions as chapters in this book.

There are two senses in which the contents are narrow. The issues dealt with are a limited set, of the kind introduced above, which have been raised by the juncture of certain disciplines at a particular time. In addition, the participants were selected from several overlapping areas (cognitive psychology, neurology, philosophy of mind and of science). These areas overlap in their interest in a set of themes and phenomena, which makes the enterprise more focused. It also contributes to the extent to which the participants could speak a common language.

Psychology of various kinds, neurology, neurophysiology, artificial intelligence, and philosophy are interacting at the moment in a way that they did not before. Clinical psychologists are looking to cognitive science for theoretical frameworks, and cognitive psychologists are more interested than previously in understanding emotional disorders. Psychologists and philosophers of mind are finding that the psychological dissociations shown by neurological patients provide test cases for their arguments. Neurologists concerned with brain damage have been adopting to a much greater extent the investigative techniques of psychology and are joining with psychologists to find functionalist models both to characterize the disorders they deal with and to guide their clinical inquiries. Artificial intelligence not only provides functionalist models and theories, and tests their cohesion and workability, but has given psychology a new range of theory and vocabulary. But it too is more influenced by both normal and pathological psychology.

The language in which these disciplines have all been able to converse is that of functionalism. Functionalism is that discourse which focuses on the functions performed by systems and the functional relationships of their components. It deals with them in abstract terms which are indifferent to what is being dealt with by the system and to the particular instantiation of that system. Since it deals in the manipulation of abstract symbols it is the language that characterizes computation. It is also clearly of importance to all the sciences to be able to have a functionalist level of theory. Perhaps the hub of this book, though in some places tacit, is whether consciousness provides a problem for functionalism. Without dwelling too much on this at the moment, the contributors adopt or discuss what is probably the whole range of views on this relationship. Some people think that the absence of consciousness in functionalist models is a feature, i.e. that it represents a substantive theoretical claim, such as that consciousness is not relevant to behaviour. Others think that such absence is not a feature of functionalism, just that it is beyond the scope of 'scientific' psychology. Some believe that there are quite adequate functionalist characterizations;

others believe that we need to tighten up our referential criteria before we can decide. There is also the claim that such characterizations as exist omit the central aspect of consciousness, phenomenal experience, and that psychology is incomplete without it. If consciousness has causal status, if it has an effect, then it ought to be dealt with by functionalist models.

Since these themes were the motivation and agenda of the meeting, and in view of the constraints of overlap and common language, it was inevitable that the participants are not representative of all current approaches to consciousness. Thus there are several phenomena, aspects, and views of consciousness that are not dealt with or represented in this book. Approaches such as the hermeneutic, phenomenological, evolutionary, developmental, and clinical are to be found represented and discussed in other recent collections; for example, the volumes edited by Pope and Singer (1978), by Underwood and Stevens (1979, 1981; Underwood 1982), and by Horowitz (1988). Such approaches clearly have implications for those outlined in this collection. Indeed reference to them is made by several of the present authors. But full representation would have presented difficulties for a small workshop meeting, where the main objective was to clarify commonalities and differences within cognitive science. Indeed the focusing of issues and the common language of contributors is what makes this volume different from other edited books on consciousness.

There is an unfortunate yet easily understandable paradox in the relation of the meeting to this book which stems from it. The purpose of the meeting was discussion, though that had to be engendered by pre-circulated papers. There most certainly *was* discussion, amounting in the formal sessions alone to some 254 pages of typed transcript, excluding what could not be heard and what could not be discreetly transcribed. Since this discussion was one of the main goals we tried very seriously to find a way of including it in the book in some form. But it could not be easily divided up and fitted neatly at the end of each contribution. What we settled on was an attempt to get the contributors to revise their presentations in the light of and in answer to the discussion of their original papers, and to encourage them to cross-reference where appropriate and where possible.

The outcome of this process is that the book has two structures. There are those topics explicitly addressed by each author. There are also the central but more implicit themes which give the book a unity and focus and which produce the major differences of stance and approach.

Themes

The main themes that emerge concern (a) what is to be explained, (b) how to explain it, and (c) what level of discourse or theory is necessary, is most useful, and is scientifically legitimate. These issues arise out of the focus of two complementary types of inquiry: one can address oneself to the question of consciousness or to problems posed by behavioural phenomena.

When the focus of explanation is consciousness, for some of the contributors it is phenomenal experience which constitutes the prime candidate for explanation (MK, AJM, KO, TS, LW)[4]. For others, aspects of the control of behaviour constitute the central problem (PNJ-L, CU), while others focus on self-knowledge or our lack of it (MHE, MSG). Different usages of the term consciousness are treated on the one hand as different aspects of a single entity, all requiring related explanation (PNJ-L, CU), and on the other hand as suggesting that there is no single coherent phenomenon or topic to be explained (AA, KVW) or that certain usages are beyond scientific explanation (EB). Is it possible that our use of language is so mistaken and incoherent that it not only leads to confusion (AA, KVW), but that in fact there is really nothing to be explained (DCD)? As one of the contributors remarked, it is somewhat easier to take a critical stance to consciousness than to provide effective and rigorous definitions. There is some tension here between those who want the topic specified and those who maintain that definitions should be the theoretical goal rather than the starting point.

Complementary to focusing on consciousness for explanation, is to take behaviour as one's starting point and to ask what is the appropriate way of accounting for it. Indeed what motivated the meeting was that many investigators have recently sought to account for normal and pathological behaviour in terms of consciousness. Several of the authors in this book explain the reasons for this (AJM, LW, MHE, TS). But even if one accepts such reasons [see Holender (1986) for dissent], the question remains as to the appropriate level of discourse. While many of the contributors are committed to functionalist psychology (EB, PNJ-L, TS), several emphasize brain-state accounts (PSC, RLG, MK), while others feel that the personal level cannot be forsaken and locate at least some explanation in the social domain (MHE, AJM, KO). As regards the issue of intentionality, although some doubts are raised, it is argued that it can be treated within functionalism (RVG), but the relation of its nature to phenomenal experience remains an open question.

[4] Relevant chapters are indicated by the authors' initials.

This divergence is mirrored by the positions taken with regard to the scientific status of the concepts. On one side, it is argued that phenomenological concepts, so far as they relate to something that cannot be completely conveyed by reports, have no place in science (EB); that is, what some conscious state feels like is not itself a representation of the kind that could have informational equivalence with a report. By contrast it is proposed that not only are phenomenological concepts legitimate, but if we want adequate and full accounts then present scientific boundaries may have to be violated (AJM). The most prevalent position is to seek translation of the phenomenological—either to the functionalist level (TS, PNJ-L, CU) or to the neural level (MK, RLG) or to some combination (MSG). A more radical alternative that can be considered is to abandon the phenomenological (DCD) or reduce it to progressively lower levels of neurobiology (PSC). Finally, for several authors (AA, KVW), scientific status depends on more precise terminology than we now have.

Organization of chapters

Since most of the contributions do not deal exclusively with one topic, they have not been explicitly placed in sections. However the ordering of the chapters reflects the main issues addressed by the authors. These can be adequately captured as follows: the status of different aspects of consciousness; criteria for using the concept and identifying instances; the basis of consciousnes in functional brain organization; the relationship between different levels of theoretical discourse; functions of consciousness.

The opening chapters concern the status of the concept of consciousness in its different senses, and the positions adopted set the reference points for what follows. In the first chapter, *Kathleen Wilkes* deals with the adequacy of the term 'consciousness' as referring to something to be explained. She adopts two strategies for this. First, she suggests that if there is an explanandum, one ought to find that it is picked out by language. Second, given that in English the term exists, she asks whether it refers to something which for scientific purposes is unitary or coherent. On the first issue, she concludes that there is little equivalence to the terms 'mind' and 'consciousness' in the lexicons of classical Greek, Chinese, Croatian, or even in the English of a few centuries ago. On the second issue, after listing the referents of 'consciousness' in psychology, she suggests that the relationship between them is that of an arbitrary set rather than that of a 'natural kind' (where the constituents are systematically related). Whether the individual referents are