Consciousness Lost and Found
A Neuropsychological Exploration

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Recognizable variants of passages in this book will be found in The problem of animal consciousness in relation to neuropsychology (Behavioural brain research, 1995, 71, 1715), Fragments of memory (to appear in
Neuropsychologia), Chapter 1 of Animal Intelligence, a Royal Society Discussion Meeting publication (Oxford University Press, 1985), and in Blindsight (Oxford University Press, 1986).

L. W.
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Introduction

The starting point for this book is the study of brain-damaged subjects who retain the very capacities they think they have lost. The form in which each of these capacities is demonstrated may be different, but in some sense it is the same capacity. And so a blindsight patient may claim not to see the very visual stimuli that he or she can be shown to be able to discriminate by guessing, and without the patient's having knowledge of such success. The amnesic patient can be shown to learn and retain information that he or she does not realize is memory nor can be made to realize. For that patient, there is no experience of remembering an event beyond a minute or so. In fact, in every major class of defect in which patients apparently lose some particular cognitive ability through brain damage, examples of preserved capacities can be found of which the patient is unaware. This range extends from perception, to meaning, to memory, and to language, with several different subtypes within each of the categories.

These facts are well known to neuropsychologists, but not so well known to a wider public. But quite aside from their intrinsic interest, they seem to offer both a challenge and an opportunity to consider the brain mechanisms of conscious awareness, and what its functional status might be in patients' lives. It also presses us to ask whether animals who share much the same brain anatomy as humans also share awareness. To tackle such a question requires that we ask of animals the same types of questions we ask of people when we try to decide whether they are aware.

There is something of an epidemic of interest these days in consciousness, and especially in trying to understand how the brain manages it whatever it may be, and for that matter, whatever manages means. Philosophers, psychologists, cognitive scientists, physicists, and neuroscientists have been addressing the issues in surprisingly large numbers over the past 5 years, and this is to be warmly welcomed. The
development, in itself, is remarkable because the subject, at least for scientists, traditionally was dismissed pejoratively as metaphysics, outside the scope of their subject and impossible to pursue empirically. No doubt some aspects still are, but several are not. And many philosophers of mind considered it to be unnecessary for their arguments to turn to, or be based upon, scientific facts; their task as regards science, if there was one, was to clear up the muddle in the utterances of the scientists. Some, of neoWittgensteinian ilk, attack these with self-congratulatory zealotry. Personally, at any rate, had it not been for patients actually forcing me to admit that not only was there a problem, but a fascinating and important one, I probably should have stayed clear of what scientists used to think of as metaphysics, and what philosophers relished as a muddle. I find it mildly amusing that for some 26 years I held the Chair of Psychology in a department at Oxford that was dedicated to teaching undergraduates in the School of P.P.P. Psychology, Philosophy, and Physiology. The majority of students combined psychology with philosophy (only 2 of the 3 P's were studied), but during my tenure these two disciplines, for most tutors, with a few exceptions (one of them a noteworthy Wilde Reader of Mental Philosophy), and for most students, remained quite disparate. The P.P.P. students could well have been reading Greek and not philosophy as far as the psychologists were concerned, and the same separation, perhaps even greater, was maintained by the philosophers regarding psychology. By the time I was about to retire in 1993, forces from both within and outside Oxford had moved to bring the psychological and philosophical interests closer together, and today, throughout universities in the West there is a heavy barrage of joint seminars and lectures on related aspects of psychology and philosophy of mind, together with new allied subjects, such as cognitive science. And there are academic societies devoted to their union, or at least their disputation, both in America and in Europe. I have benefited enormously from attendance at many of these meetings, and from discussions with a wide spectrum of interesting contributors. Admittedly, some Oxford philosophers have remained resolutely and disdainfully aloof from this development. (I can recall trying to introduce two of the leading and well-known investigators of sign language in chimpanzees to a distinguished Oxford philosopher in the Senior Common Room of an Oxford college. The topic and my guests' findings at the time were innovative, provocative, intrinsically fascinating, and deeply controversial. I failed no flicker of interest could be evoked in him.) There are so many philosophers in Oxford that there is room for non-
standard deviations, but I have no doubt that the liaison is
here to stay. We may even graduate soon to joint examination questions!

This book will not review the manifold offerings of others. This will be interpreted by some as arrogance on my part, or as ignorance, or as laziness, attributes that are not mutually exclusive, and I am willing to admit some culpability in at least two of these regards. In part, I am unable to do justice to some of those offerings, even though I have read or attempted to read much of what is available, and have found many reviews useful. But I simply do not understand the intricacies and mysteries of arguments from quantum mechanics (Penrose, 1989; Hameroff and Penrose, 1995) and wave collapse (Burns, 1990), nor what specific investigations, if any, must be truncated by Gödel’s theorem. And what I do understand only serves to puzzle me as to the form in which some of the arguments are constructed and how one would forge links with the empirical evidence that sits at quite a different level. As regards philosophers of mind, they are a very heterogeneous group and I have been stimulated and provoked by many. Those who actually address empirical findings are close to my heart, but philosophers do not usually actually start from that position. And by and large the philosophers’ knowledge of the empirical findings in the field that I wish to examine is understandably patchy, with certain notable exceptions, and is sometimes just wrong. In other cases they seize upon a single interesting phenomenon, like split-brain patients, and expand it into a universe of speculations, gedanken experiments or even gedanken fantasies, without fussing over whether the original details were correct. Finally, I am wary of some philosophers who wish to solve the problems from the armchair by verbal boot-strapping, no matter how clever they are, and some are very clever. It is curious how some attacks on folk psychology emanate from that folksy piece of philosophical equipment, from which it is simply not possible to generate new domains of knowledge. I have found the scientists writing on the topic, especially Crick (1994) and Edelman (1989), not to mention some of my own colleagues and coworkers, to be the most helpful to me, and am grateful that they do not let philosophical niceties get in the way of speculation about real brains. In any event, to write such a treatise that reviewed this wealth of opinion would simply detract from my main purpose. Aside from The neuropsychology of consciousness (Milner and Rugg, 1992), an excellent but varied collection of reviews by different authors, and the valuable edited volume by Marcel and Bisiach (1988), Consciousness in contemporary science, which includes some neuropsychological material but also ranges more widely, there are few books
that systematically derive their arguments from the varieties of consciousness that are lost in brain damage, and that pursue the implications for how
the brain might operate when they are present, both in people and in animals. It seemed worth trying to concentrate on that as the main project.

But first of all, some explanation of the oddity of the title is required. As the book concerns patients who, in one sense or another, have lost awareness, there is no puzzle over Lost in the title. By Found I mean retained and established (The concise Oxford dictionary). To convey that sense, strictly speaking, it should be founded, but that would be infelicitous. I wish to contrast my position with any other that explains consciousness by explaining it away, or substitutes as yet unknown computer software for it. I think, instead, one should try to elevate one's explanations to the level where they actually give full credence to the importance of awareness. Any patient who has lost his sense of seeing or of touch will understand that: what he has lost is his awareness, not his concept, nor a draft, nor the key to allow him to escape from a Theatre, Cartesian or otherwise. This is in no sense to diminish the great complexity of the issues and of allied human cognitive capacities generally, nor to deny the vagueness with which the terms like consciousness and awareness are used, nor to fail to acknowledge the illuminating treatment of these terms by skilful dissectors, but notwithstanding all that, there is a hard nub that requires explanation not only for such patients (some of the blindsight subjects I have studied are avid readers of the topic!) and anyone else interested in them but also because perhaps it offers a starting point, from where the matter might be pursued further. It would be pretentious in the extreme to suggest that I have Found the solution to the thorny problem of conscious awareness and its neurological basis. I have had a go. The character of what is Lost in the syndromes under consideration offers a challenge, as well as suggesting a possible route towards a solution, or at least to a step in that direction. Moreover, it is one that maps onto both philosophical and neuroscientific landscapes. If this particular enterprise fails, it will be in part because at least some aspects of the exploration are empirically testable. Whatever the outcome, I hope it may nevertheless tempt others to also have a go.

When I first embarked on this project, I teasingly put it forward to the relevant editor at Oxford University Press as a proposed book on the What, Whether, How, and Why of Consciousness. I thought the mock pretentiousness might amuse some of my fellow Delegates of the Press. Embarrassingly, this was actually preserved as the title of the proposal that was forwarded to the Delegates of the Press by the editor, and it was actually
endorsed by the Delegates as such but with a wry note that perhaps a simpler title might be preferable! Indeed, it would be. But I do
seriously think the neuropsychological facts are pertinent to all four of these questions, and all four are, in one way or another, addressed in the book. There are even four chapters that contain these words in their titles. I am not wholly satisfied with my efforts, but they are starting points, for me at least.

I have tried to make each chapter intelligible in its own right, and the book as a whole readable to the non-specialist. As a result, there is a measure of redundancy between some of the chapters to make it unnecessary for the reader to skip backwards or forwards, although the figures are only reproduced once. Addressing the non-specialist will annoy some, but hopefully will be a relief to others. I know that I would be very annoyed in reading this book as a specialist. There are many pertinent facts and counter-arguments that the expert will accuse me of omitting and, even more serious, many authors whose work deserves to have been included will note the absence, the more so as I might actually be ignorant of it. This is especially so in the areas in which I have not personally worked, or worked to a much lesser extent than with the phenomena of blindsight and amnesia, with which in total I have spent some 30 years. Nothing offends the active scientist more than for his or her work to be passed over, and nothing more titillates an author who wishes to irritate a competing adversary than knowingly to fail to quote their work. I can only plead that I have not deliberately discriminated, nor have I been tempted by or enjoyed any such titillations here. I am sorry for admissions and oversimplifications; I have no doubt these will be pointed out to me.

There is another difficulty with which an author in this area must contend, namely that the field is moving so quickly that he is bound to be out of date. Some of the speculations found in the chapter on brain mechanisms, (How?) may well have already been put to the test by the time this goes to press, especially as non-invasive methods of examining function are evolving apace. Especially in the area of blindsight, memory, and brain imaging, I resolutely hope that current research will have made some of the speculations redundant!

The book starts with a review of some of the conditions in which brain-damaged patients can be said to have lost an awareness of a retained capacity, followed by a discussion of some of the general issues that are pertinent to neuropsychological analysis. There are aspects of these general issues and matters of terminology that are not necessary for the argument, but an
Appendix is devoted to taking some of these a bit farther. There follow chapters on blindsight and amnesia, but the former deliberately focuses on neural pathways and visual attributes, and the latter more on the
nature of the psychological disorder and patients' commentaries. Given the importance of commentaries in making decisions about another person's awareness, the next chapter addresses the question of awareness by animals, the possible homologous role of commentaries for them, and how the question might be addressed in practical terms. The chapter on How? grapples with the question of how the brain deals with the problem in its normal intact state, and I also take the opportunity to expose my own general strategic proclivities.

Finally, except for a brief summary chapter, there is a treatment of the question of the evolutionary value of awareness. Here, too, as is true throughout, the emphasis is derived from the patients: if you want to know what something might be good for, examine the situation where it is no longer present.

The summary chapter tries to bring some of these disparate strands together. If many other readers are like me, they will jump to that chapter first, but although there are mysteries about consciousness, the final chapter is not quite like the final chapter of a mystery thriller. I hope it will not discourage them from going back to the evidence and the arguments.
The unseen and the unknown

The very phrase, brain-damaged conjures up terrible images of lives blighted or destroyed. Those types of damage which do cause serious loss of mental and physical capacities are what most people associate with brain damage, and I do not want to trivialize these cases in any way. However, there are many different types of damage, resulting in a whole spectrum of effects. At the less serious end of the spectrum lie those phenomena which impact on everyday life in relatively minor ways, and can be accommodated through changes in habits and routines. It is possible to sustain damage to the brain which affects only your ability to remember strings of numbers longer than one or two, or your memory for names which plagues practically everyone sooner or later, with or without brain damage. Or a part of the visual field might be made insensitive as a result of damage to the visual cortex. But in that case the subject simply uses the remaining intact visual field for everyday purposes, and may scarcely notice the missing part of the field. Indeed, we all have a small region of absolute blindness in each eye, the optic disc, of which we remain unaware in everyday life.

To the scientist brain-damaged patients have been a source of highly specific knowledge and fascinating, illuminating insights. Through the cooperation of patients, neuropsychologists have made significant progress in understanding what the damaged brain tells us about the normal brain. Those cases of specific impairments restricted to relatively isolated capacities that occur with damage in limited regions of the brain have been especially useful. They can tell us not only what capacities can be disturbed in relative isolation from others, but also which anatomical systems of the brain are important for their processing, especially in conjunction with modern imaging methods that reveal the functioning of both the normal and the damaged living brain.

There is another aspect of brain damage that is really the major focus of