Out-of-the-Body Experiences

Implications for a Theory of Psychosis

Charles McCreery, DPhil

Formerly Lecturer in Experimental Psychology

Magdalen College, Oxford

Oxford Forum

Chapter 7
Dissociation of arousal in the laboratory III: Illustrative examples of individual subjects

Introduction

In this chapter I shall present some longitudinal data from five individual subjects, the purpose of which will be to illustrate various aspects of the theory of out-of-the-body experiences proposed in the preceding chapters. Some of the data may also serve to indicate what might be expected, according to that theory, from possible future studies of OBEs in the laboratory.

The data were analysed using a different mode of the Jordan analysis programme to that described in the previous chapter. In this second mode the programme switched to a moving average mode. Instead of prompting for a block range over which to analyse the amplitude spectrum, the programme prompted for the number of blocks to use in the average. For example, with a sample-size of six blocks (the value used in analysing the data shown in the present chapter), the programme produced a series of averages for the blocks 1 to 6, 2 to 7, 3 to 8, and so on.

An advantage of the moving average as a measure in this context is that it smooths out some of the random fluctuations in the amplitude spectrum from block to block. Smoothing the data in this way makes the trends, if any, over the sort of time-spans of interest in the present experiment more readily apparent to the naked eye. Used in conjunction with the graphing facility of a spreadsheet, it was possible to make visual plots of the progress of a variable such as the median frequency over time, and it is a number of such plots which will be shown below.

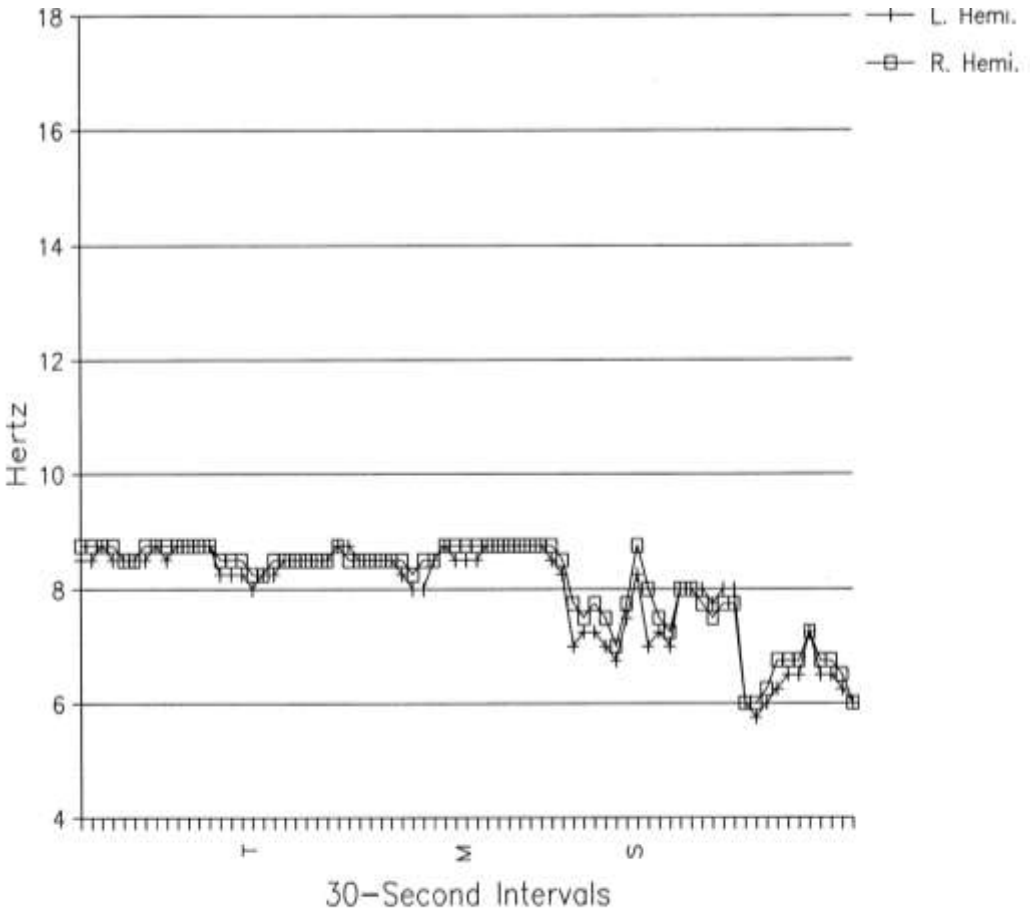
Mr. O'D. (Subject No. 40)

The first case to be presented is that of the Control subject whose amplitude spectra, taken from his left hemisphere during the Control and End phases of the experiment, were shown in Chapter 6.

Figure 7.1 shows the median frequency of his two hemispheres, plotted against time, for the duration of the experiment. Each data-point represents the moving average of six four-second data-blocks.

Figure 7.1, Subject 40, Control

Median Frequency, both Hemispheres, Against Time



In this and subsequent plots, three transitional points in the experiment are indicated on the *x* (time) axis: 'T' indicates the start of the tape, with earlier

points representing the three preliminary exercises (mind a blank with eyes open, mind a blank with eyes closed, and performing mental arithmetic) and the three-minute Control period; 'M' marks the end of the physical relaxation exercises and the start of the purely mental ones; and 'S' marks the onset of the sound phase.

There are three points of interest in the present context. First, it will be seen that until shortly before the sound phase both median frequency measures show very little fluctuation, all the values lying between 8.00 and 8.75 Hz.

Secondly, there is very little divergence between the hemispheres from beginning to end of the experiment.

Thirdly, the irregular decline in both median frequencies from just before the start of the sound phase to the end of the experiment corresponds well to the subject's subsequent verbal report of his state; he said that the procedure had been very relaxing, more so than just lying in bed at night, because it had involved clearing the mind. There were delta waves visible in the paper record at various points during the sound phase, and the subject produced what sounded like an isolated snore four and a half minutes into the sound phase.

It is perhaps also worthy of remark that the fall in the median frequency begins before the onset of the sound, during the mental relaxation phase, and the onset of the sound produces a temporary rallying of the M50 to its former level, presumably reflecting the temporarily arousing effect of the sound onset. The median frequency measures eventually fall nearly, but not quite, to the 5 Hz level adopted by Schwilden *et al* (1987) as a criterion of unconsciousness.

This Control subject (i.e. one who had no experience of OBEs) illustrates the obvious point that the approach of sleep is not by itself a sufficient condition for the occurrence of the ecsomatic state. Some additional factor clearly needs to be present for someone to have such an experience, even though the hypnogogic state appears to be one of the most frequent conditions

for their occurrence. I have suggested in previous chapters that either lability of arousal, or chronic hyperarousal, may constitute an additional, necessary factor.

Subject No. 4

The next case comes from one of the five Outside subjects, and provides a striking contrast to the previous one.

The data plotted in Figure 7.2 comes from a female subject recruited to the OBE group, since she reported previous experience of the ecsomatic kind. She was one of the five subjects who endorsed the Outside question following the experiment, which was the question designed as a criterion of whether a subject had had an OBE in the course of it.

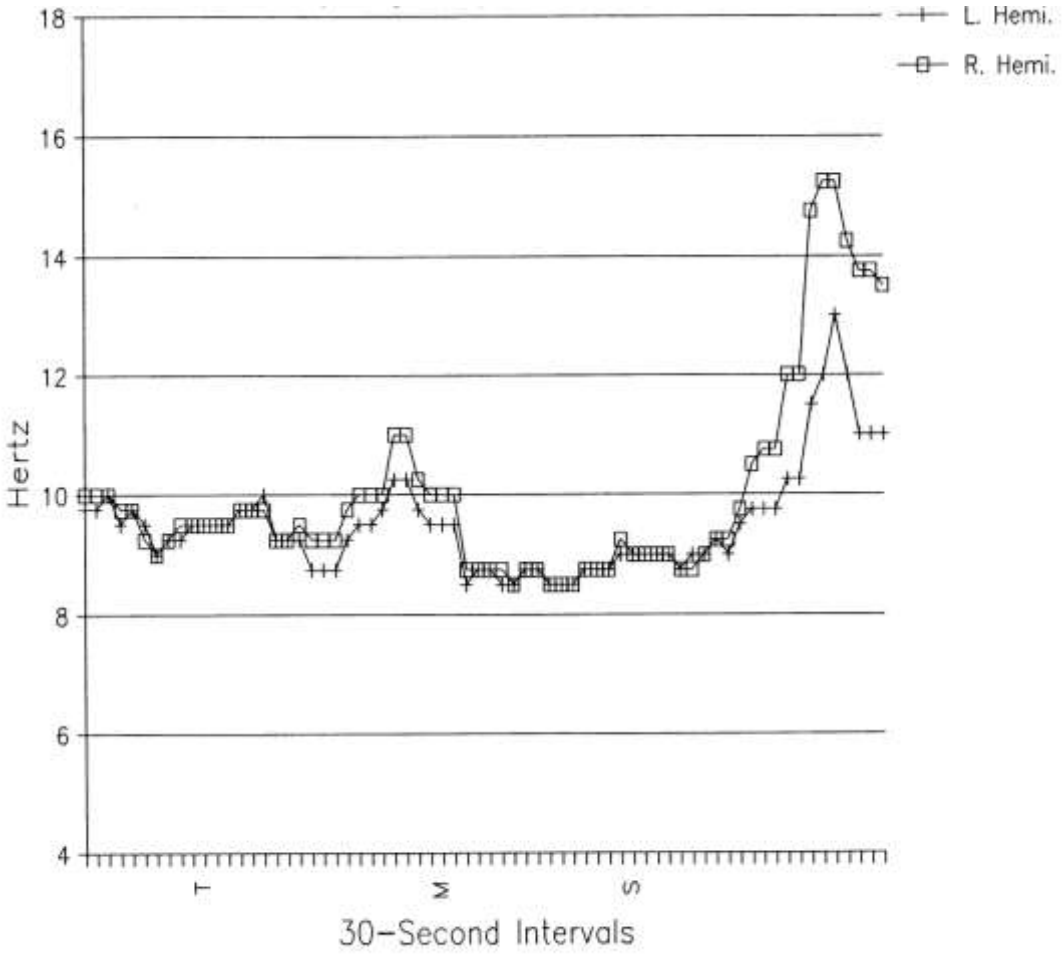
As described in Chapter 6, participants who endorsed the Outside question were invited to describe their experience briefly in writing, and Subject 4 characterised hers as ‘a feeling of detachment from my body, as if it wasn’t there’.

Figure 7.2 illustrates a striking activation of both of her hemispheres towards the end of the experiment, the right even more so than the left.

Figure 7.2, Subject 25, OBEr

Median Frequency, both Hemispheres,

Against Time



It will be seen that the peak in the median frequency measures comes after the start of the sound period, and that they are beginning to fall back by the end of it.

It is also worth noting that the median frequency of the two hemispheres is virtually identical for considerable periods of the experiment, an exception being a phase about a third of the way in, towards the end of the muscular relaxation exercises. Even in this latter phase, however, the relative activation

of the right hemisphere does not approach that displayed during the sound phase.

The pattern evident in the EEG maps in an interesting way onto the subject's subjective account of her experience. In contrast with two other subjects, who said their experiences occurred at the start of the sound phase (see Tables 6.3a and 6.3b in Chapter 6), this subject said her experience occurred ell into the second half of the sound period, when perhaps three-quarters of the sound period had elapsed.

This fact may be related to an ambivalent attitude on her part to the experimental procedure. Whereas several subjects conveyed pleasurable anticipation before the start of the experiment, she was the only one to enquire before the start what she should do if she 'couldn't bear it' at any stage.

She also said afterwards that the initial impression of the sound was unpleasant, reminding her somewhat claustrophobically of being in a ship. She then overcame this impression by reminding herself that she was not really in that situation, and by remembering the prior instructions to relax.

If the subject's estimation of when the experience occurred is correct then it would seem possible that it coincided with the peak in the two M50 measures, or at any rate that it occurred within a short time of it either way. If this was the case then it would be consistent with the hypothesis that the experience occurred during a micro-sleep, triggered by the subject's extreme arousal in response to the experimental situation.

Mr. A.S. (Subject No. 13)

Not all the cases in which there was relative activation of the right hemisphere resembled the one just presented in having the median frequency in both hemispheres increasing at the time. There were also cases in which there was

relative right hemisphere activation while both hemispheres' median frequency was declining. The next case was of this kind.

The subject is Mr. A.S., the graduate student in philosophy who was one of those who gave a qualified endorsement of the Outside question. He reported a series of perceptual experiences, starting with flickering blue light and progressing to an aerial view of a landscape, as described in Chapter 6.

Figure 7.3, Subject 23, OBEr
Median Frequency, both Hemispheres,
Against Time

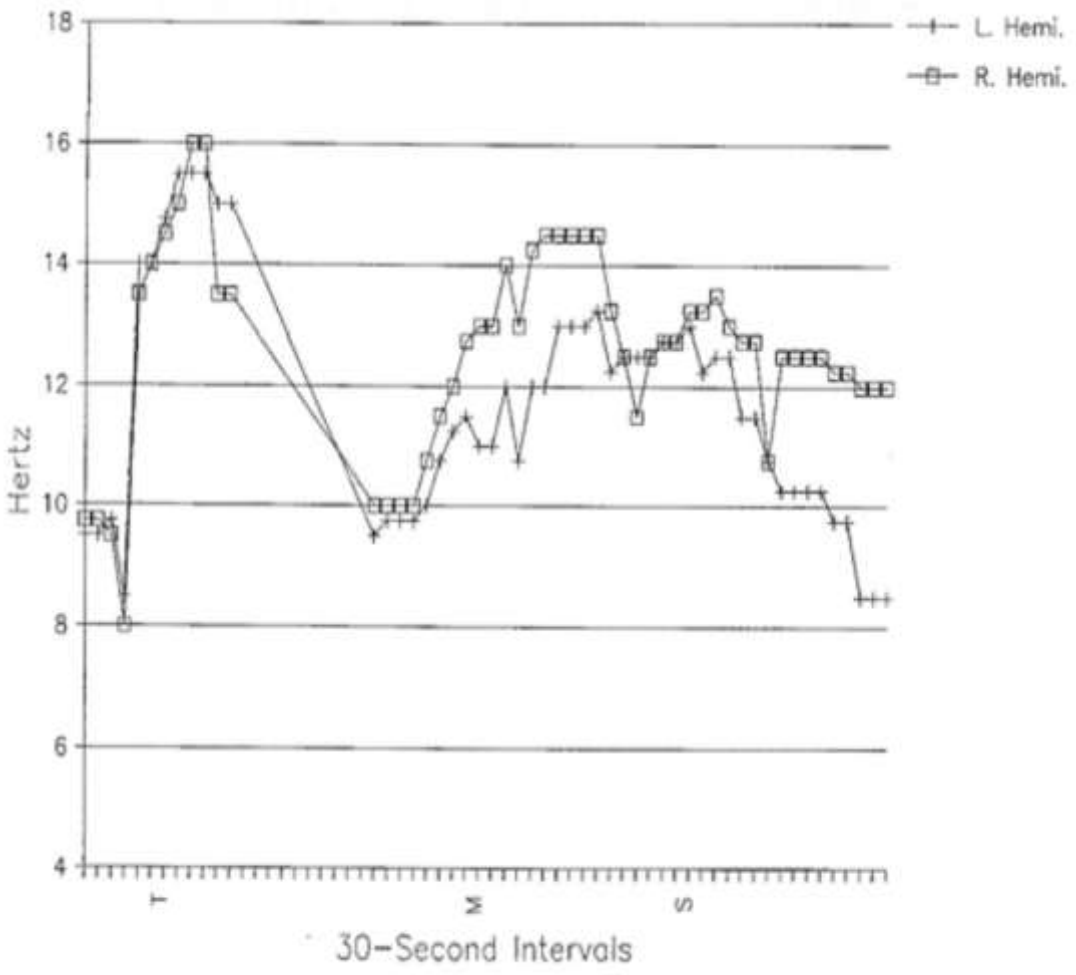


Figure 7.3 illustrates how a relative activation of the right hemisphere occurred when both hemispheres' M50 was declining in value, rather than increasing, as it was in the previous case.

The jump in median frequency after the first four values corresponds to the onset of the tape, following the silent control period. There are some missing data shortly thereafter, due to artefact-contamination during the muscular tension-and-relaxation exercises.

It will be seen that the maximum divergence between the two hemispheres occurs towards the end of the sound period, when both the median frequencies are on a declining trend, but the left hemisphere more so than the right.

Mrs. R.H. (Subject No. 17)

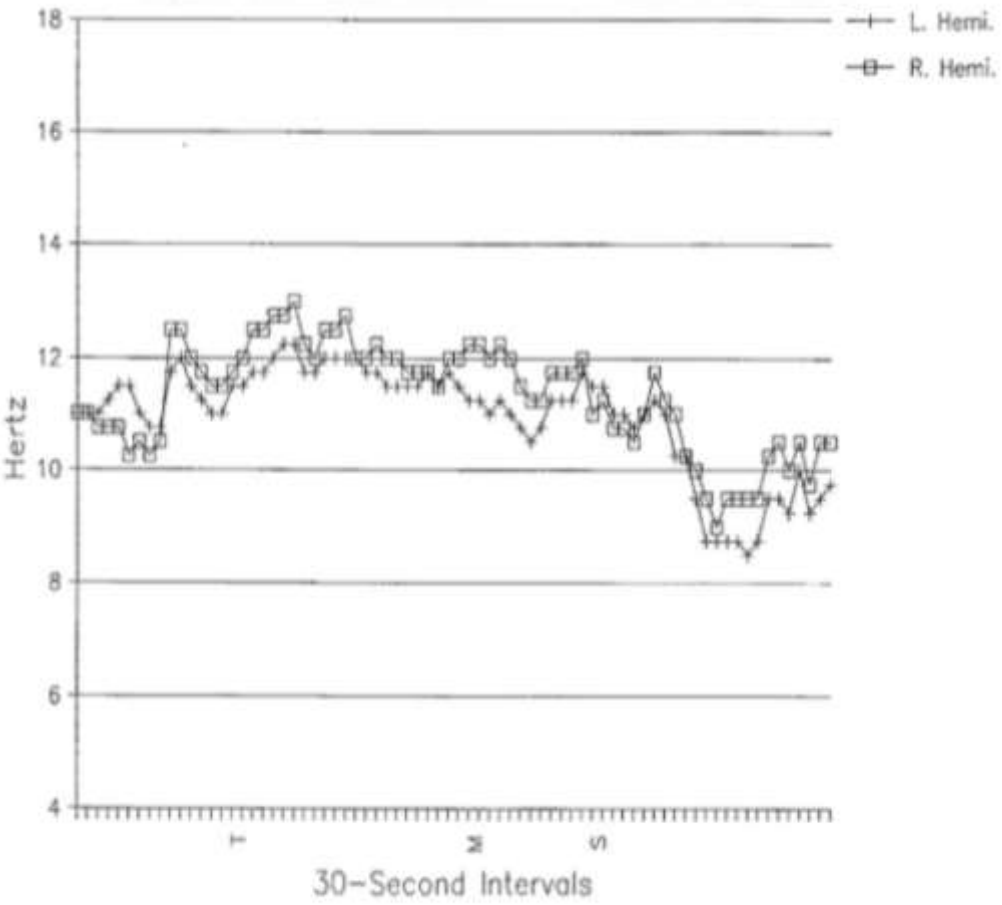
Mrs. R.H., from the OBE group, was one of the five subjects who endorsed the Outside question (see Table 6.3a in Chapter 6).

She described her experience, which she regarded as having lasted the whole of the sound phase, as 'a wonderful floating feeling after relaxation of all muscles'. She said this had been 'very similar' to her previous, spontaneous OBEs, of which she considered she had had at least eight. She evidently found the experience reinforcing, as she said at the end of the experiment, 'Is that all?', as if disappointed there was not to be more of it, and described the whole experience as 'very pleasant'.

Figure 7.4 shows the progress of her median frequency in both hemispheres over the course of the experiment. It will be seen that there is a general tendency to intermittent relative activation of the right hemisphere, not just towards the end of the sound phase, but throughout the experiment. Also noticeable is a general declining trend in the median frequency measures,

starting soon after the start of the tape (marked ‘T’ on the x-axis), with a particularly marked dip about the middle of the sound phase.

Figure 7.4, Subject 17, OBEr
Median Frequency, both Hemispheres,
Against Time



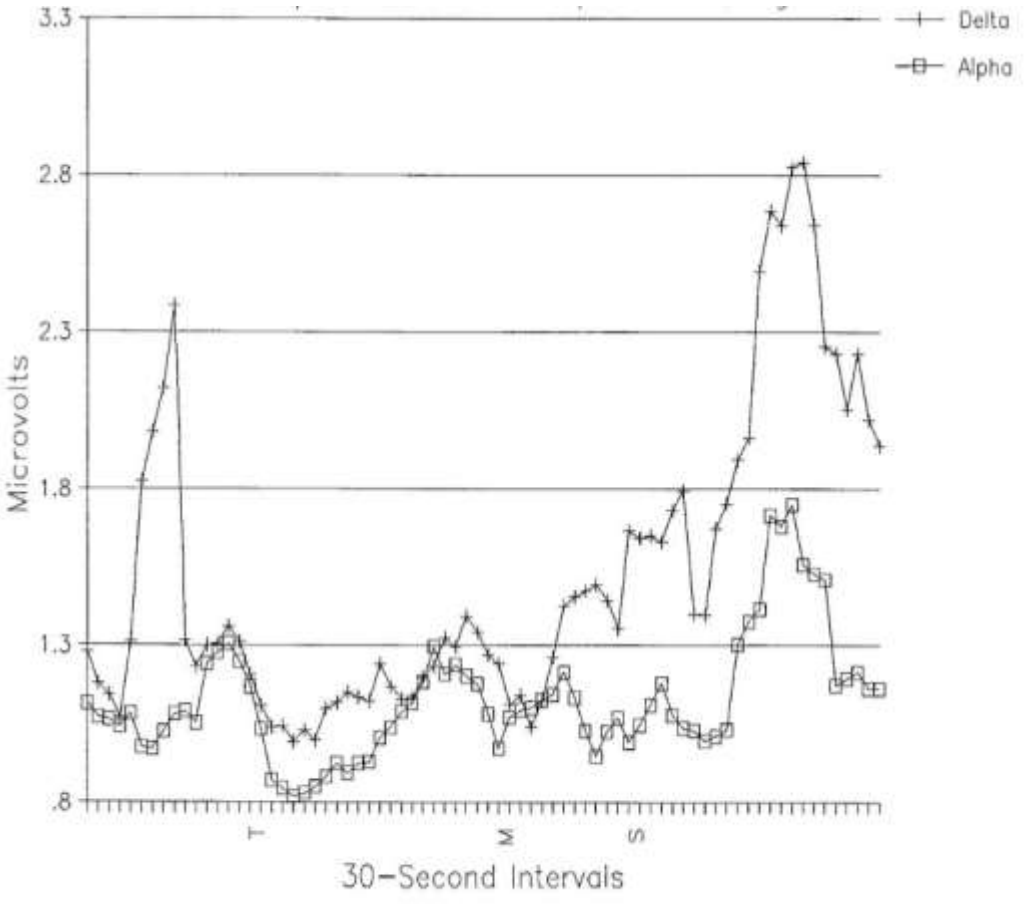
Dividing up the EEG bands

In this section we will discuss the results of applying a further option in the Jordan programme, which segregated the data of the four bands, *delta*, *theta*, *alpha* and *beta*, so as to show the course of the average amplitude in each band

separately. This will be relevant to the question of how near to sleep Mrs. R.H. may have been during the sound phase.

Figure 7.5 illustrates the results of applying this mode of the programme to the data represented by Figure 7.4, and selecting for representation the *alpha* and *delta* bands. It shows the moving average of the absolute amplitude in these two bands over the course of the experiment, and in the right hemisphere. Each data-point represents the average of a maximum of six blocks, as with this subject's median frequency plot shown earlier.

Figure 7.5, Subject 17, OBEr
Absolute Amplitude, *delta* and *alpha* bands,
Right Hemisphere, against Time



The plot of the progress of the amplitude in these two bands shows a tendency for *delta* amplitude to increase from about the start of the tape, with a particularly marked surge about half way through the sound phase. (*Delta* was defined operationally in this experiment as power in the 1-3.75 cycles per second range, which is a range characteristic of the deeper stages of sleep.)

Also worth noting is the fact *alpha* and *delta* amplitude move in parallel, rather than inversely, during the late surge of *delta*. This illustrates a point made in the preceding chapter, namely that electroencephalographers were gradually compelled, with the development of new, computerised techniques for analyzing the data, to abandon the original idea that activity in different bands was necessarily unrelated.

The subject was adamant that she had not fallen asleep at any point during the sound phase. However, she described herself as feeling ‘overrelaxed’, as if she could have gone to sleep if she had wanted to, during the control period (i.e. before the start of the tape), and possibly ‘a bit sleepy, very briefly’, during the sound phase, though she found this difficult to distinguish from relaxation.

It is interesting to note that both these points in the course of the experiment correspond to surges in *delta* amplitude, since there is a notable surge during the control period, prior to the start of the tape, as well as the even larger one occurring during the sound phase.

What may also be relevant is that her sense of the passage of time seems to have been considerably distorted during the sound phase. She estimated this had lasted a mere thirty seconds and ‘couldn’t believe it’ when assured that it had in fact lasted ten minutes.

Overall, I suggest that the data represented in the above figure supports the hypothesis that the subject’s experience during the sound phase was an indication of Stage 1 sleep.

Conclusion

Examination of individual cases such those presented in this chapter provides support for the validity of the median frequency measure as an index of arousal. In a number of cases in addition to those discussed above, it was found to reflect well the subject's verbal report of having approached or actually entered sleep. In addition it was found to be related in a meaningful way to heightened arousal in the case of the second case quoted in this chapter.

The data presented are at least compatible with the idea that out-of-the-body experiences occur in states of either high or low arousal, as pointed out by Irwin (1985), rather than states in between these extremes.

At the same time it is clear that the occurrence of these extremes of arousal are a necessary and not a sufficient condition of the occurrence of an OBE. For example, the manifestations of Stage 1 sleep by Subject 40, the control subject illustrated at the start of this chapter, were evidently not accompanied by any anomalous experience. Likewise, many people are involved in high-arousal situations, such as car accidents or medical emergencies, without subsequently reporting OBEs.

We therefore have to look for individual differences in nervous system function as a further predisposing factor. I suggested earlier that this may consist, either of a tonic state of relative hyperarousal, or of a tendency to lability of arousal, even if the person's average state is relatively normal.

In the concluding two chapters I will describe how the model I have put forward for out-of-the body experiences may give pointers to a theory of psychosis.