Following a marital crisis, Agatha Christie disappeared from her home in Berkshire on the evening of Friday 3 December 1926. The following morning, her abandoned Morris Cowley car was found near Newlands Corner, a local beauty spot five miles from Guilford, Surrey. An enormous search was carried out with the help of many volunteers. On the evening of Sunday 12 December, a woman resembling Agatha Christie was reported to be staying at a hotel in Harrogate, Yorkshire, registered in the same name as that of her husband’s mistress. Two days later, Mrs Christie was formally identified by her husband. According to Jared Cade (1998) in *Agatha Christie and the 11 missing days* (Peter Owen Publishers, London) Mrs Christie told her husband that she had deliberately staged her disappearance in order to spite him.
INTRODUCTION
Amnesia is an abnormal mental state in which memory and learning are affected out of all proportion to other cognitive functions in an otherwise alert and responsive patient. This memory impairment can affect learning of new material (anterograde amnesia) because of impairments in the encoding, storage and retrieval of memories. It can also cause retrograde amnesia, when difficulties arise in trying to recall previously acquired memories, which might be personal experiences (episodic memory), general information (semantic memory) or perceptuo-motor skills (procedural memory).

CLASSIFICATION OF PSYCHOGENIC AMNESIA
(Table 1) Psychogenic (i.e. not due to identifiable brain disease) episodes of memory loss can be situation-specific as occurs in amnesia for offences, in the fragmentary recall in post-traumatic stress disorder, and in amnesia for childhood sexual abuse. In other cases, psychogenic amnesia involves a more global memory deficit, often accompanied by loss of the sense of personal identity, as in a ‘fugue state’. We favour the term ‘psychogenic amnesia’ because it does not make assumptions about mechanism (as does ‘dissociative’ amnesia) or about the degree to which memory loss results from unconscious processes (‘hysterical’ amnesia) rather than motivated, deliberate or conscious processes (‘factitious’ or ‘exaggerated’ amnesia). The term ‘functional amnesia’ is unsatisfactory because there are deficits in function (‘processing’) in organic amnesia (i.e. due to identifiable brain disease), and psychogenic amnesia is ‘dysfunctional’ per se. On the other hand, it can be argued that the term ‘psychogenic’ makes assumptions about underlying aetiology and when and under what circumstances a psychological stress is sufficient to become ‘psychogenic’. However, there can be debate about the point at which markers of pathophysiology amount to ‘aetiology’ even in organic amnesia.

SITUATION-SPECIFIC PSYCHOGENIC AMNESIA
This refers to a brief, discrete episode of memory loss, usually related to a traumatic event in the individual’s personal history (also known as ‘dissociative amnesia’ in DSM-IV).

Amnesia for offences
This will be discussed under medico-legal aspects below.

Post-traumatic stress disorder
This is characterized by intrusive thoughts and memories (‘flashbacks’) about the traumatic experience, anxiety and avoidance phenomena, and several cognitive and somatic (‘hyperarousal’) complaints such as an enhanced startle reaction, hypervigilance, severe irritability, and impaired concentration. Some memories are enhanced, detailed, and recalled intrusively thereafter, whereas others may be forgotten: there can be instances of partial memory loss (‘fragmentary’ memory), distortions or even confabulation. The most common memory problem is disorganization in retrieval, which is evident as gaps in recall and difficulty in producing a coherent narrative; this could explain why in psychotherapy the victims recall more and more detail of their traumatic experience as therapy progresses. Post-traumatic stress disorder symptoms can occur even in cases when the subject appears to have been completely amnesic for the episode. After head injury, amnesia predominates and although vivid intrusive memories can occur they are infrequent; by contrast, in post-traumatic stress disorder intrusive memories predominate and characterize the disorder, and memory gaps are less common. However, where post-traumatic stress disorder follows concussion, the effects of the psychological trauma can be difficult to separate from those of the actual concussion.

Childhood sexual abuse
Recent theories suggest that memories for abuse may never be completely forgotten but rather they are retained in a vague unelaborated form,
Three main factors predispose to psychogenic fugue:
- Severe precipitating stress such as marital or emotional discord, financial problems or, as in the case above, a charge of offending.
- Depressed mood: some cases have been contemplating suicide before the episode or do so following recovery from it.
- A history of a transient organic amnesia: up to one half have experienced severe head injury in some studies.

**Global Psychogenic Amnesia**

**Psychogenic fugue**
A psychogenic fugue consists of a sudden loss of all autobiographical memories and the sense of self or personal identity, usually associated with a period of wandering, for which there is a subsequent amnesic gap after recovery. These states usually last no more than a few hours or days. When a fugue lasts much longer than this, it may evolve into ‘focal retrograde amnesia’ (see below), but the possibility of deliberate simulation must be strongly considered.

A 55-year-old man, after being confronted with embezzlements he was alleged to have made from his work place, disappeared from his home the following morning, emerging that evening 500 miles away in the railway station of the city where he grew up. He also disappeared for a briefer period 3 months later, the day after the police had searched his home. In this case, these episodes of undoubted fugue (in which personal identity was lost) emerged against a background of mild-to-moderate organic memory impairment of vascular aetiology.
Multiple Personality Disorder

Multiple personality disorder patients are rare, and vulnerable to suggestion from clinicians and researchers. They have been described particularly in the American psychiatric and neuropsychological literature.

DIFFERENTIATION OF PSYCHOGENIC FROM ORGANIC AMNESIA

(Table 2.) Differentiation of psychogenic fugue from organic neurological (i.e. due to some form of brain damage) and other conditions is usually clearcut, although the basis of psychogenic focal retrograde amnesia is much more controversial (Kopelman 2002a). Table 3 illustrates some points of similarity and difference between psychogenic amnesia and neurological conditions. In neurological conditions (including transient global amnesia), there is usually relative sparing of early memories but severe impairment of recent memories (i.e. a ‘temporal gradient’), whereas in psychogenic amnesia early memories are completely lost, but recent memories (since the onset of the condition) may be spared (‘reversed temporal gradient’). Box 1 details points to note in the assessment of psychogenic amnesia.

We have proposed a model of how psychosocial factors and brain systems may influence autobiographical memory retrieval and personal identity (Fig.1) (Kopelman 2002a,b). Psychosocial stresses affect frontal control/executive systems, thus inhibiting the retrieval of autobiographical and episodic memories during a fugue or psychogenic focal retrograde amnesia. The inhibition will be exacerbated, or made more likely, when a subject is extremely aroused, very depressed, or where there is a previous learning experience of transient amnesia. If the stresses are severe enough, the inhibition may even affect the ‘personal semantic belief system’, resulting in a transient loss of knowledge of self and identity. In spite of the suppression of autobiographical memory retrieval by the frontal inhibitory mechanisms, anterograde learning still can occur from ‘normal’ environmental stimuli via the intact medial temporal/diencephalic system.

MEDICO-LEGAL ASPECTS OF PSYCHOGENIC AMNESIA

Amnesia for offences

There seems to be a clear relation between the violence of the crime and impaired recall in the offenders, victims and any eyewitnesses. Between about one-quarter and one-half of those convicted of homicide claim amnesia for the killing. There are conflicting views about the persistence of such amnesia. Pyszora et al. (2003) found that at 3-year follow-up, one-third of her amnesic sample had complete return of memory, one-quarter had partial return, and about 40% reported no return of memory. Evidence for brain disease and EEG abnormalities are inconsistent across studies. However, a history of alcohol misuse and acute intoxication is common. With regard to psychiatric factors, the most important seems to be depressed mood, which has often been present for some weeks or months before the offence.

Table 2  Differential diagnosis of psychogenic fugue

<table>
<thead>
<tr>
<th>Alcoholic ‘blackout</th>
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<tbody>
<tr>
<td>Transient global amnesia</td>
</tr>
<tr>
<td>Transient epileptic amnesia</td>
</tr>
<tr>
<td>Epileptic fugue (rare)</td>
</tr>
<tr>
<td>Simulation/malingering</td>
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</tbody>
</table>

Table 3  Comparison of fugue/psychogenic states with transient global amnesia (TGA)/transient epileptic amnesia (TEA)

IN BOTH
Can be preceded by precipitating stress/significant life-event
Standard investigations (routine EEG, CT, MRI) can be normal

DIFFERENTIATION
Loss of personal identity in fugue, never in TGA
Repetitive questioning in TGA/TEA, seldom in fugue/psychogenic amnesia where there may be ‘la belle indifférence’
Other symptoms/signs, e.g. sensorimotor in TEA, wandering in fugue
‘Temporal gradient’ of retrograde amnesia in TGA/TEA vs. ‘reversed gradient’ in psychogenic amnesia
BOX 1 ASSESSMENT OF SITUATION-SPECIFIC PSYCHOGENIC AMNESIA

Characteristics of the amnesia
- Identify the last thing a subject can recall before the amnesic gap.
- Time and circumstances at which continuous personal memory returned.
- Length of the amnesic gap and any evidence of islets of preserved memory within it.
- Evidence of memory loss for any time-periods before or after the event.
- Ask about the consequences of the amnesia, and find out what the subject has learned from others about the episode.
- How memories may have changed since the episode.
- Check any records to find out at what point the person first complained of amnesia.
- Background circumstances of the incident.
- Attitude towards the amnesia and recovering missing memories.
- Previous episodes of amnesia, past history of head injury, epilepsy or other neurological disorder.
- Any change of behaviour or personality?
- Rule out the possibility of an automatism.

Neurological examination

Mental state examination
- Depressed mood.
- Psychotic symptoms such as hallucinations/delusions (e.g. in psychotic depression, alcoholic hallucinosis or alcoholic paranoid states).
- Other hysterical symptoms (apart from amnesia).
- Current cognitive function.

Interview relatives, witnesses to the event, and any other informants

Inspect relevant documents (e.g. legal)

Investigations
- Man red cell volume.
- Liver enzymes including gamma glutamyl transferase.
- Urine drug screen.
- EEG (suspected epilepsy).
- Brain CT, MRI if relevant.

Neuropsychological testing
Examine recall and recognition of both verbal and visuospatial material as well as memory for recent and more remote events.

Faking tests
Malingersers may fail easy items, or on aspects of memory (e.g. procedural memory) which patients with severe neurological amnesia will pass.
Amnesia for offences occurs in four main circumstances:

Crimes of passion
These are unpremeditated and take place in a state of extreme emotional arousal, the victim usually being closely related to the offender (88% of cases). One-quarter of the offenders attempt suicide immediately afterwards. There is often an accompanying diagnosis of depression and occasionally of schizophrenia.

A 40-year-old Egyptian man was married to an English woman and they had two young children. He discovered that his wife was having an affair with a musician and he became depressed. He was treated with antidepressants as an outpatient in the local hospital. During the afternoon of the offence, he had a furious row with his wife, during which he threatened to kill the musician. Later, he could recall going to kiss his daughter goodnight, but he could not remember anything after that until the police arrived. However, in the meantime, he had telephoned the police, and he was subsequently charged with the murder of his wife by stabbing.

Alcohol abuse or dependence, and severe intoxication at the time of the offence
The level of intoxication is normally severe and the victims are not commonly (25%) related to the offender. In some cases, other drugs are also implicated. As is well known, alcohol can produce transient amnesia (known in the literature as an ‘alcoholic blackout’) when peak blood alcohol levels are very high.

A 20-year-old man had consumed eight or more pints of beer plus three whiskies in the course of an evening. The last thing he could recall was being in a night-club with friends, who had been threatened by a rival gang, and who were then pacified by attendants. Continuous memory returned early the following morning, whilst interviewed by the police, although there were ‘islets’ of preserved memory: peering down from a roof above a shop, being kicked
An automatism is an abrupt change in behaviour in the absence of conscious awareness or memory formation, associated with certain specific clinical disorders such as epilepsy, hypoglycaemia or parasomnias.

by a policeman, being made to descend a ladder with handcuffs on. He had no idea how he had climbed on to the roof or why. He was charged with assaulting a police officer whilst under the influence of alcohol. Eight months after the offence, there had been some infilling of memory between the ‘islets’, and shrinkage of the amnesic gap from about 6 to approximately 2 hours.

Psychosis/delusional memory
Occasionally, amnesia occurs in the context of a florid psychotic episode. The most common offences are minor acts of aggression or criminal damage. The accounts from the perpetrator and observers are completely different, and sometimes such anomalous and paramnesic accounts can result in inappropriate charges.

Brain disorder/automatism
Automatisms are a rare cause of amnesia for an offence, and there is no automatism without amnesia. Automatisms are poorly defined in most texts, but a reasonable definition is ‘an abrupt change in behaviour in the absence of conscious awareness or memory formation, associated with certain specific clinical disorders such as epilepsy, hypoglycaemia or parasomnias’. In addition to these disorders, some psychiatrists (e.g. Fenwick 1990) have argued that fugue can be viewed as a ‘hysterical automatism’, although this is a potentially very hazardous loosening of the concept. Epileptic automatisms, and postictal confusional states, occasionally result in crime. In these cases an interictal EEG may reveal seizure activity involving the hippocampal and parahippocampal structures bilaterally as well as the mesial diencephalon, crucial structures for memory formation. The amnesia is generally complete.

A student in his early twenties had a history of complex partial seizures and tended not to comply with antiepileptic medication. This resulted in repeated attendances to emergency departments with prolonged fits (and sometimes status epilepticus) which required admission to hospital to manage. On coming round in a state of postictal confusion, he was disoriented and aggressive, out of character for him, resulting in aggressive behaviour and on one occasion an attempt to strangle another patient. The disturbed behaviour resolved after 24–48 h, but during that time he required close monitoring and nursing. He did not recall the events afterwards, and he was insightful and very remorseful.

Legal classification
In English law, ‘insane’ automatisms result from ‘intrinsic’ brain disease such as epilepsy, and are liable to recur: hence (under the criminal Procedure (Insanity) Act 1964) leading to a direction to hospital for psychiatric treatment. ‘Sane’ automatisms result from extrinsic causes, potentially leading to acquittal, e.g. if insulin administration can be shown to have precipitated a hypoglycaemic automatism. Drug intoxication and even alcohol intoxication have been used to argue for ‘sane’ automatism in very rare instances (Fenwick 1990). Although this black-and-white distinction between ‘sane’ and ‘insane’ automatisms may make sense in law, it makes little medical sense. Epilepsy should not be regarded as a form of ‘insanity’ and disposal to a secure hospital (e.g. Broadmoor) is not appropriate. Hypoglycaemia can result from (treatable) intrinsic as well as extrinsic causes. Extrinsic as well as intrinsic causes of automatism are likely to recur, and the law is very muddled in its approach to alcohol-induced offences.

One of us managed to argue successfully for acquittal in the case of a young diabetic man who after self-administering his insulin delayed taking a meal because he had become interested in a television programme. Subsequently, he killed a friend without any apparent motivation, and he was clearly hypoglycaemic when the police arrived.

‘Hysterical’ amnesia or simulation?
The question of simulation always arises in such cases. This is difficult to exclude, and various techniques for the detection of simulation have been suggested (Boxes 1 and 2) although none is entirely satisfactory. Points indicating that many of these amnesias may be genuinely ‘hysterical’ (i.e. unconscious), as opposed to feigned or malingered, include the following:
the subjects often describe their amnesia in ways resembling those with other forms of hysterical or psychogenic amnesia;
- the subjects often give themselves up or make no attempt to avoid capture;
- victims and eyewitnesses of crime often show failures of recall in similar circumstances;
- in law, amnesia per se does not avoid criminal responsibility, and may actually be damaging in a defense if the accused cannot give an account of or explanation for his or her behavior at the time of the supposed offence. Only in the very rare cases where a case for ‘sane automatism’ can be argued is amnesia legally helpful to a defendant.

CONCLUSIONS
In conclusion, psychogenic amnesia can be situation-specific (e.g. post traumatic stress disorder, offences) or global (e.g. fugue, psychogenic focal retrograde amnesia). Amnesia for an offence is commonly claimed, particularly in violent crimes and homicide. Amnesia as such does not avoid responsibility for committing an offence (and can actually be damaging to mounting a defense), except in those rare instances where some additional factor (e.g. epilepsy, parasomnias, insulin-induced hypoglycaemia) means that the case for a ‘sane’ or ‘insane’ automatism can be argued for. The distinction between ‘sane’ and ‘insane’ automatisms is medically very unsatisfactory but has massive legal implications (acquittal vs. psychiatric disposal, usually to a secure hospital).

REFERENCES