

18. Assessing the presence of mental disorder

INTRODUCTION

Assessment is the process of collecting information relevant to the diagnosis, management, and treatment of a patient's clinical condition, including distinguishing or recognising the presence of disease or disorder from its symptoms or manifestations. The mental state examination is equivalent to the detailed physical examination in general medicine.¹ Its purpose is to elicit and observe any signs and symptoms indicative of mental disorder. Various medical terms are used to record and describe what is observed and it is important to have an understanding of their meaning. In addition to recording any symptoms and signs of disorder apparent on examining the patient, the assessment includes conducting any tests necessary to establish a diagnosis, for example biochemical investigations or an EEG. The nature and purpose of these tests are described later (1089). Mental illness may be seen as the response of an individual to his life situation so that, as Hamilton has noted, one must always ask the threefold question: "Why did this person break down, in this way, at this time?"² More particularly, Sir Denis Hill has emphasised that it is necessary to investigate the patient's psychic reality and experience and the bearing this has on his disorder; it is also necessary to investigate the psycho-social environment and culture within which the patient lives and works; and it is necessary to examine the patient as a biological organism. The psychiatrist's capacity to know, after the initial interview, to which area he should in the main direct his attention is dependant upon his clinical experience and training, his skill in examination, but above all upon his detailed knowledge of the clinical phenomena which mental disorder presents, and their significance.³

SYMPTOMS AND SIGNS

A person may be diseased but "symptom-free" which is another way of saying that following the onset of disease, pathological changes may or may not make themselves evident. When they do, they are described as "manifestations" which, by medical custom, are usually distinguished as "symptoms and signs."⁴ A sign is an objective indication of a disease or disorder that is observed or detected by a doctor upon examining and interviewing the patient, in contrast to a symptom which is noticed or reported by the patient. Symptoms are therefore what people complain of and worry about so that the customary distinction is between an objective observation

¹ A. Sims and D. Owens, *Psychiatry* (Baillière Tindall, 6th ed., 1993), p.8.

² *Fish's Outline of Psychiatry* (rev. Max Hamilton, John Wright & Sons, 4th ed., 1984).

³ Sir Denis Hill, in W.A. Lishman, *Organic Psychiatry, The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987), page vii.

⁴ *International Classification of Impairments, Disabilities, and Handicaps: A manual of classification relating to the consequences of disease* (World Health Organisation, 1976), p.25.

and a subjective complaint.⁵ In practice, the distinction "often difficult" make where psychological phenomena are concerned,¹⁶ partly because certain phenomena may be simultaneously experienced and reported by the patient and observed by his doctor. In common usage, and in the text below, the term "symptoms" includes objective signs of pathological conditions.

The purpose of recording the patient's symptoms

"Listen to the patient, he is telling you the diagnosis," the physician William Osler once observed. The recording of a patient's symptoms is undertaken to identify the type of mental disorder from which he suffers — symptoms being pointers towards the underlying pathology — and, following on from this, the most appropriate form of treatment and the patient's likely response to that treatment. As to the diagnostic significance of symptoms, psychiatry often distinguishes between the form and content of mental phenomena such as hallucinations and delusions. The content of an idea may "be meaningful and understandable. But it is even more significant that the idea is a delusion, and not merely an overvalued idea, that the hallucination is occurring in a setting in which other people do not experience false perceptions; and that the patient's difficulty in expressing himself coherently is not explicable in terms of limited vocabulary or education, or emotional arousal."¹⁷ Thus, the form of an experience (e.g. the fact that a person is experiencing visual hallucinations) is of diagnostic value. However, the content of the experience (what the person imagines he sees) is determined by the individual's background, has social and cultural determinants, and is less often diagnostically significant.

The relative significance of symptoms

Even if not found in the normal population, and therefore indicative of a pathological process, symptoms may exist as manifestations of several different diseases or disorders and, when viewed in isolation, be incapable of sustaining any single diagnosis.⁸ Very few clinical features give unequivocal information.⁹ The importance of one finding may depend upon the presence or absence of others, so that a symptom is most often known by the company it keeps. The early, generally non-florid, symptoms of mental disorder are referred to as "prodromal features." A symptom which is characteristic of a particular disease or disorder, and is alone sufficient to establish a diagnosis, is said to be "pathognomonic." In many cases this is simply because the disease is defined in terms of the particular feature. Where a feature has to be present for the diagnosis of a disease, but its presence does not

⁵ Thus, Kleinman writes that "the physician's task is to replace these biased observations with objective data: the only valid sign of pathological processes; they are based on verified or verifiable measurements." A. Kleinman, "What is Specific to Western Medicine" in *Companion Encyclopedia of the History of Medicine* (ed. W.F. Bynum & R. Porter, Routledge, 1993), Vol. 1, p.18. For the avoidance of doubt, the signs therefore comprise abnormal behaviour observed by the examiner, or described to him by others, and those abnormalities of subjective experience apparent upon questioning the patient. Thus, the statement "I am God" is a sign of mental disorder whereas the statement, "I feel depressed," is a symptom because it represents a subjective complaint by the patient about the way he feels.

⁶ A. Sims, *Symptoms in the Mind* (Baillière Tindall, London, 1988), p.6.

⁷ R.E. Kendell, "Schizophrenia: A Medical View of a Medical Concept" in *What is Schizophrenia?* (ed. W.F. Flack *et al.*, Springer-Verlag, 1990), p.69.

⁸ For example, the persistent repetition of a word ("perseveration") may be a symptom of schizophrenia but it may also be associated with an organic disorder and various other functional disorders.

⁹ See G.W. Bradley, *Disease, Diagnosis and Decisions* (John Wiley & Sons, 1993), p.56.

guarantee the diagnosis, because the same finding may be present in other diseases, it is sometimes referred to as obligatory. Symptoms which are not pathognomonic or obligatory may nevertheless be commonly present or valuable diagnostically. An exclusionary feature is one which is the opposite of pathognomonic in that its presence excludes a particular diagnosis. A symptom distinctive of an illness may not be considered to have that significance because the classification is erroneous. The severity of a symptom can be rated on a number of different criteria, such as frequency, intensity, duration or degree of incapacitation or tolerability.¹⁰

ARRANGEMENT OF THE CHAPTER

The arrangement of the chapter, in terms of meaning of words used to describe symptoms and signs commonly referred to in psychiatric reports is shown below.

SYMPTOMS AND SIGNS: ARRANGEMENT OF THE CHAPTER

Consciousness	The client may be unconscious or his consciousness obviously impaired.	1058
Responsiveness	If the client's consciousness is unimpaired, he may nevertheless be unresponsive.	1059
Level of activity	The patient may be markedly over-active or under-active.	1059
Posture, etc.	The client's posture, mannerisms or gestures may be idiosyncratic.	1060
Movements	There may be evidence of involuntary movements.	1062
Physical signs	The client's physical state may suggest poor self-care, poor nutrition or an organic disorder.	1067
Memory	The client's answers may indicate problems memorising or recalling information.	1070
Affect, mood	The client's emotional responsiveness (affect) or his underlying mood may be abnormal.	1073
Anxiety, etc.	The client may be anxious or fearful, causing irritability, agitation, panic, hostility or depression.	1075
Speech, thought	Any of the following may be abnormal: the volume or rate of speech; its articulation; the choice of words; the association/juxtaposition of words and phrases; the content of the patient's thoughts.	1076
Perception	The client's statements or behaviour may indicate that he is experiencing hallucinations or other perceptual disturbances.	1086

¹⁰ R. Manchanda, *et al.*, "A Review of rating scales for measuring symptom changes in schizophrenia research" in *The Instruments of Psychiatric Research* (ed. C. Thompson, John Wiley & Sons, 1989), p.61.

The reason for dealing with symptoms in this order reflects the order in which they are likely to become apparent to a lay observer. Important information about the patient's mental state may be conveyed before any examination or interview takes place, simply by observing him. It may be apparent that the client is inaccessible, either because his consciousness is impaired or because he is unresponsive. The patient may be markedly over-active or under-active. His posture (the relative position of the different parts of the body at rest or during movement) or certain mannerisms or gestures may be idiosyncratic. In some cases, his general appearance may be suggestive of self-neglect. Involuntary movements may be conspicuous, perhaps affecting the individual's gait (style or manner of walking). Following the interview's commencement, other symptoms and signs of mental disorder may become apparent. It may be noticeable that his memory is impaired or that his mood or emotional state is abnormal. There may be evidence of disordered thought processes or the content of the patient's thought may be abnormal. This may be a consequence of the fact that he is experiencing abnormal perceptions, such as hallucinations.

IMPAIRED CONSCIOUSNESS OR RESPONSIVENESS

Consciousness is the awareness of one's own internal thoughts and feelings together with the ability to recognise one's external environment. It is important to appreciate that a person may be fully conscious and yet profoundly unresponsive to his immediate environment.

Impaired consciousness

To be unconscious is to have no subjective experience. Consciousness is a continuum with full alertness and awareness at one end and brain death at the other.

Full alertness/ awareness	Clouding of Consciousness	Sopor	Coma	Brain death
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- **Clouding of consciousness** describes impairment of orientation, perception and attention and it is seen in organic mental disorders. There is difficulty with thinking, attention, perception, memory and usually drowsiness¹¹ but sometimes excitability. Such clouding is seen in some organic mental disorders.
- **Semi-coma (sopor)** — In cases of semi-coma (sopor), there is a partial response to stimulation which is incomplete and mostly non-purposeful; the movements are ineffectual such as scratching the stimulated area.
- **Coma** lies at the opposite end of the spectrum from full alertness and awareness of the environment.¹² The Glasgow coma scale is used to grade the degree or level of coma.

¹¹ Drowsiness is also sometimes used as a general word describing a state of consciousness between full wakefulness and unconsciousness or sleep.

¹² W.A. Lishman, *Organic Psychiatry, The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987), p.5.

Disorientation, attention and concentration

Disorientation is a loss of awareness of oneself in relation to time (the date or time of day), place (where one is) or identity (whether one's own or others), as a result of which speech and behaviour tend to be muddled. Disorientation may be the product of clouding of consciousness, a head injury, a chronic brain disorder such as dementia, or the result of intoxication. To be attentive is to be alert, aware and responsive, while to concentrate is to focus and sustain mental activity on a particular task.¹³ Poor attention and concentration are usually the result of tiredness or disinterest. In some cases, the conscious patient's apparent lack of attentiveness simply reflects the fact that his attention is focused elsewhere — **distractibility**. If a patient is distractible, his attention and conversation changes from topic to topic in accordance with stimuli from within or without, for example in response to visual hallucinations. More rarely, impaired attention or concentration is indicative of clouding of consciousness.

Confusion and confusional states

A confusional state is a disorganised mental state in which the abilities to remember, think clearly and reason are impaired. The confusion may be acute or chronic. Delirium is a state of acute mental confusion in which the activity of the brain is affected by fever, drugs, poisons or injury. Chronic confusional states may be the product of long-term use of anxiolytics, dementia or some other organic disorder.

Stupor (awareness accompanied by profound lack of responsiveness)

It is not necessarily the case that a patient who is inaccessible is in a state of coma or sopor. The absence of any obvious signs of activity, movement or response to external stimuli does not of itself mean that consciousness is impaired: a person may be fully conscious and yet profoundly unresponsive to his immediate environment. Consequently, when a person is motionless, and both speech and spontaneous movement are absent or minimal, this lack of response to external stimuli may be misinterpreted as unawareness of it. While terms such as coma and sopor describe a substantial impairment of consciousness, **stupor** describes a profound lack of responsiveness to external stimuli and the environment rather than profound unawareness of it.¹⁴ The two components of stupor are sometimes described as **akinesia** (a voluntary absence of any movement) and **muteness** (a voluntary absence of any speech).¹⁵ Where a state of stupor appears to form part of a catatonic schizophrenic illness, it is usually described as **catatonic stupor**. Catatonic stupor is defined in the DSM Glossary (1119) as a marked decrease in reactivity to the environment and reduction in spontaneous movements and activity, sometimes to the point of appearing to be unaware of one's surroundings.

Retardation and psychomotor retardation (a slowing of activity)

Retardation is a general slowing down of the conscious patient's mental and bodily functions — a slowing of his thoughts, speech, actions, reactions and movement. The term **psychomotor retardation** emphasises that this retardation has a psychic

¹³ A. Sims, *Symptoms in the Mind* (Baillière Tindall, London, 1988).

¹⁴ W.A. Lishman, *Organic Psychiatry, The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987), p.6.

¹⁵ See e.g. A. Sims, *Symptoms in the Mind, supra*.

cause, such as depression or catatonic schizophrenia, rather than some neurological cause.

Marked overactivity

Over-activity for substantial periods of time, evidenced by over-talkativeness, restlessness, pacing rapidly up and down, constant talking or loud singing is known as **pressure of activity**. In manic states, such pressure of activity is often accompanied by correspondingly accelerated speech, grandiosity and elation.

Catatonic excitement and catatonic agitation

The phrase **catatonic excitement** is used in the DSM classification (1119) to describe excited motor activity which is apparently purposeless and not influenced by external stimuli. The term **catatonic agitation** is preferred in the ICD glossary (1117), where it refers to a state in which the psychomotor features of anxiety are associated with catatonic syndromes. In both cases, the patient's restlessness and activity are associated with his abnormal ideas and perceptions rather than with his mood state (the degree of elation or depression present).

Pressure of activity	Normal range of responsiveness	Psychomotor retardation	Stupor
Catatonic excitement			Catatonic stupor

POSTURE, GESTURES AND MANNERISMS

The word **attitude** is most often used in psychiatry to denote a patient's posture or position rather than his personal viewpoint. In cases of catatonic schizophrenia, where a client's preoccupation with overwhelming incapacitating ideas or perceptions has rendered him unresponsive, this unresponsiveness may be accompanied by prolonged, stereotyped, postures.

MANNERISTIC AND STEREOTYPED POSTURES

A patient's posture may sometimes be described as manneristic or stereotyped. Conventionally, manneristic postures differ from stereotyped postures in that the former are not rigidly maintained.

Catatonic posturing

The term **catatonic posturing** describes the voluntary assumption of an inappropriate or bizarre posture which is usually held for a long period of time. For example, a patient standing with arms out-stretched as if he were Jesus on the cross.

Body maintained in a semi-rigid position ("waxy rigidity")

The terms **cataplexy** and **catatonic waxy flexibility** — and, also, the latter's Latin variant, **flexibilitas cerea** — are synonymous. They describe a physical state of sudden onset in which the muscles of the face, body and limbs are maintained by increased muscle tone in a semi-rigid position, possibly for several hours, during which time neither expression or body position changes. Voluntary movement and sensibility are suspended, respiration and pulse are slowed, and body temperature falls. The affected person's limbs can be moulded into any position. When moved in this way, they feel as if made of a pliable wax which enables these externally imposed postures to be maintained. Phenomena of the kind described are observed in catatonic schizophrenia and a number of other conditions.

Body maintained in a rigid position ("iron-pipe rigidity")

Waxlike postures may also appear with rigid rather than flexible musculature. Consequently, a distinction is sometimes drawn between flexible and rigid cataplexy (**catatonic or iron-pipe rigidity**). In the former case, a posture is assumed at the slightest external prompting; in the latter, the patient's self-assumed posture resists external attempts at modification and is maintained by the person against all efforts to be moved.

MANNERISMS, GESTURES OR RITUALS

A person's mannerisms, gestures or rituals may sometimes be highly distinctive and strikingly unusual.

Mannerisms and gestures

A mannerism is a gesture or expression peculiar to a person, such as an odd way of walking or eating. If the mannerism involves taking up an idiosyncratic posture, rather than idiosyncratic movement, it may be referred to as a manneristic posture (*supra*). Mannerisms differ from spontaneous, involuntary, movements (dyskinesias, 1065) in that they are voluntary, if idiosyncratic, movements. They differ from stereotyped behaviour in that the latter is carried out in an unvarying, repetitive, manner and is not goal-directed.

Repetitive or imitative behaviour

While manneristic behaviour is directed towards some goal (eating in the above example), stereotypy is not. Stereotyped behaviour, or **stereotypy**, is the constant, almost mechanical repetition of an action. For example, pacing the same circle each day, head-banging, rocking or repetitive hand movements, or repeating some phrase over many weeks or months. Stereotyped movements are often rhythmic. **Echopraxia**, which is sometimes a feature of catatonic schizophrenia, refers to the imitative repetitive copying of the movements of another person.

Negativism (contrary behaviour) and catatonic negativism

Negativism is opposition or resistance, whether covert or overt, to outside suggestions or advice. For example, a person drops his arm when asked to raise it. **Catatonic negativism** is a resistance to all instructions or attempts to be moved. The

person may do the opposite of what is asked, firmly clenching the jaw in response to being asked to open his mouth.

Automatic obedience (command automatism)

The opposite of negativism is automatic compliance which may be so marked that the individual does more than is required to comply with any instructions. For example, a person who is asked to raise an arm raises both of them in an exaggerated manner. Such undue or automatic compliance is associated with catatonic syndromes and hypnotic states.

Compulsive or ritualistic behaviour

A compulsion is an irresistible impulse to perform an irrational act. The individual experiences a powerful urge to act or behave in a way he recognises as irrational or senseless and which he attributes to subjective necessity rather than to external influences. Performing the particular act may relieve tension. Compulsive behaviour may be attributable to obsessional ideas. For example, a young adult may become obsessed with the idea that his shoelaces must be perfectly tied, continually retying them for twenty minutes, and unable to move on to the next stage of dressing until this objective has been achieved; or he may continually close the refrigerator door until it eventually makes the "right" sound.

Compulsive acts and obsessive thoughts

It can be seen that the terms "obsession" and "compulsion" are not synonymous. The former refers to a thought and the latter to an act. Obsessions are recurrent, persistent ideas, thoughts, images, or impulses that are not experienced as voluntarily produced but as ideas, urges or representations which invade consciousness. A thought may properly be described as obsessional if a person cannot prevent himself from repeatedly, insistently, having that thought albeit that the content of the thought is not delusional in nature. Obsessive thoughts lie behind compulsive acts, and stereotyped or manneristic behaviour, but they may exist without being externally manifested in the form of an observable repetitive action.

ABNORMAL GAIT OR MOVEMENTS

On observing a patient, some uncontrollable movement of the body, affecting the face, head, trunk or limbs, may be apparent. Disordered movement may be the result of damage to the brain or nervous system, damage to the muscles, or the result of a biochemical imbalance, which may be medication related. It should be noted that terms such as tremor, chorea, myoclonus, tics, dystonia, and athetosis are imprecise and descriptive rather than definitive. They are not confined to particular anatomical, physiological, or pathological abnormalities. Nevertheless, their use cannot be avoided, and they furnish the clinician with terms that have some practical meaning.¹⁶ The way in which abnormal movements are categorised may be summarised as follows—

¹⁶ J.D. and J.A. Spillane, *An Atlas of Clinical Neurology* (Oxford Medical Publications, 1982), p.263.

- The most prominent functions of muscle tissue are to maintain posture and produce motion.
- The co-ordination of muscular activity involved in maintaining posture and balance mostly takes place below the level of consciousness. By contrast, the movement of joints is mainly under voluntary control of the brain and consciously intended.
- The term "involuntary movement" is used in two different senses. Firstly, movements which occur below the level of consciousness are said to be involuntary movements. Such involuntary movements are, however, entirely normal. Secondly, the execution of voluntary, willed, movements may be disrupted by unwilld and uncontrollable involuntary movements of the body, usually affecting the face, head, trunk or limbs. In this sense, all movement disorders are involuntary even when the disruption involves an interference with voluntary movement.
- **Akinesia** (literally, without movement) denotes an absence or lack of voluntary movement while **dyskinesia** (literally, bad or difficult movement) is a general term used to describe difficult or distorted voluntary movement.¹⁷
- Information about the state of contraction and stretch of the muscles is transmitted to the brain via nerve fibres contained in each muscle. Nerve impulses transmitted in the other direction, to the muscles, stimulate them, releasing a type of neurotransmitter called acetylcholine. This starts a chain of chemical and electrical events, involving sodium, calcium and potassium ions, which cause the muscle to contract. Potassium depletion causes muscle weakness while a decrease of calcium may cause muscle spasm.
- Contracting a muscle makes it shorter and draws together the bones to which the muscle is attached. Where two or more muscles oppose each other's actions, harmony of posture and movement requires their co-ordinated relaxation and contraction.
- **Apraxia** is an inability to carry out a voluntary ("purposeful") movement despite normal muscle power and co-ordination. The defect is caused by damage to the nerve tracts which translate the idea of movement into actual movement. The person knows that he wants to move in a certain way or direction but has lost the ability to recall from memory the sequence of actions necessary to achieve the desired movement.
- **Ataxia** (literally, without order) is an inability to co-ordinate muscles in the execution of voluntary movement. The typical ataxic gait is lurching and unsteady like that of a drunkard, with the feet widely placed and a tendency to reel to one side. This lack of co-ordination and clumsiness may affect balance and gait, limb or eye movements, and cause speech to be slurred.

¹⁷ However, while akinesia literally means an absence or lack of voluntary movement, it "has become the term of choice for the state of difficulty in initiating movements or changing from one motor pattern to another that is associated with Parkinson's disease." *Lexicon of Psychiatric and Mental Health Terms* (World Health Organisation, 1989), Vol. 1, p. 7.

Rapid, rhythmic, alternate contraction and relaxation of a group of muscles produces **tremor** (1066). This is associated with exertion and emotional arousal, and is commonly experienced by older people, but occasionally has a greater medical significance.

Skeletal muscle is maintained in a state of partial contraction because this helps to maintain posture, keeps the eyes open, and allows the muscles to contract more efficiently. This natural muscular tension is referred to as **muscle tone**. Tone therefore denotes the natural tension in the fibres of a muscle while **dystonia** literally means bad muscle tone. Abnormally high muscle tone causes spasticity, rigidity and resistance to movement. Abnormally low muscle tone (**hypotonia**) causes floppiness of the body or part of the body affected.

An individual's muscle tone may reflect his emotional state. Strong emotion may produce a sudden loss of muscle tone, causing the individual to collapse — **cataplexy**. Cataplexy commonly lasts for a number of seconds and, in three-quarters of cases, it is characteristic of narcolepsy. There is no loss of consciousness.

Abnormally increased muscle tone produces **muscular rigidity** and increased resistance to movement. Muscular rigidity is therefore the result of increased tone in one or more muscles, causing them to feel tight, with the affected part of the body becoming stiff and inflexible. Muscular rigidity may result in unusually fixed postures, strange movement patterns, or painful muscular spasms.

Spasms are powerful, brief, rapid, repetitive contractions of a muscle or group of muscles which are experienced as spasmodic, muscular, jerks. Hiccups, cramp, tics and habit-spasms are all types of muscular spasm. **Tics** and **habit-spasms** may both reflect and help to release emotional tension during periods of stress and so be particularly prominent at times of psychological disturbance.

Muscles usually respond to being stretched by contracting once and then relaxing. Where stretching sets off a rapid series of muscle contractions, this is referred to as **clonus** (a word meaning "turmoil"). Clonus is therefore an abnormal response of a muscle to stretching and it is suggestive of damage or disease to the nerve fibres carrying impulses to that muscle. Clonic muscle contractions are a feature of seizures in grand mal epilepsy.

If clonic muscular contractions are rapid and shock-like, they may be referred to as **myoclonus**. Myoclonus (literally, muscular turmoil) is a sudden, brief, shock-like, uncontrollable, jerking or spasm of a muscle or muscles ("myoclonic jerks"), which may occur either at rest or during movement. **Hemifacial spasms** (irregular shock-like contractions of the muscles on one side of the face) are a form of myoclonus.

DYSKINESIA

Dyskinesia (literally, bad or difficult movement) is a general term covering various forms of abnormal movement, including tremor, tics, ballismus, chorea, habit-spasm, torticollis, torsion-spasm, athetosis, chorea, dystonia, and myoclonus.¹⁸ Such conditions typically involve uncontrollable movements of the trunk or limbs which cannot be suppressed and impair the execution of voluntary movements. The whole body may be involved or the problem restricted to a particular group of muscles.

Athetosis (exaggerated, sinuous, writhing movement of muscles)

The term denotes the slow, irregular, and continuous twisting of muscles in the distal (far) portions of the arms and legs. These sinuous movements are bilateral (evident on both sides of the body) and symmetric (both sides are similarly affected). Characteristically, there are exaggerated writhing motions of the fingers, which are spread in a manner reminiscent of a snake-charmer, with alternate flexion and extension of the wrists, and twisting of the muscles in the hands, fingers, feet and toes. The hands and fingers appear to be in continuous motion and the inability to maintain them in a fixed position causes difficulty with writing and tasks such as fastening buttons. When the feet are involved, the ankles and toes intermittently turn inwards, producing an irregular, unbalanced gait. In severe cases, there is grimacing, protrusion of the tongue and abnormal articulation of speech. The patient may be able to regain some control over these movements by way of concentration and they are absent during sleep.

Chorea and choreic movements (irregular, spasmodic, jerky)

Chorea is a Greek word meaning dance (as in choreography). Chorea is characterised by quick, irregular, spasmodic and jerky involuntary movement of muscles, usually affecting the face, limbs and trunk. The movements resemble voluntary movements but are continuously interrupted prior to being completed. They also disappear or are less prominent during sleep. There is a general air of restlessness in chronic patients and an excess of motor activity with impaired ability to maintain a posture. Those parts of the limbs closest to the trunk (the proximal portions) are more affected than those further away (the distal portions) and the trunk itself may be affected. The movements are more rapid and involve more muscle groups than athetotic movements. Unlike tics, they are not predictable and occur at random. Although bilateral, the muscular movements are asynchronous rather than symmetric, that is the chorea frequently affects one side of the body more than the other. **Hemichorea** is chorea affecting one side of the body only.

Choreo-athetoid movements

Choreic and athetotic movements may exist in conjunction, when their combined effect is referred to as choreo-athetosis. The movements may be caused by various pathological processes, including pathological processes initiated as a side-effect of certain drugs. ^v

Tardive dyskinesia (involuntary muscle movements late in treatment)

Tardive means tardy, late. The term tardive dyskinesia refers to a type of movement disorder which appears late in treatment, characteristically after long-term treatment with antipsychotic drugs.¹⁹ The whole body may be involved or the problem restricted to a particular group of muscles. Involuntary, slow, irregular movements of the tongue, lips, mouth, and trunk, and choreo-athetoid movements of the extremities are common. In particular, there may be twisting and protruding movements of the tongue, chewing movements of the jaw, and puckering of the lips. These uncontrollable movements cannot be suppressed.²⁰

Tremor

A tremor may be described as a rhythmic, repetitive movement of some part of the body which results from the alternating contractions of opposing muscle groups. There is, however, no single standard description of what movement constitutes tremor.²¹ Tremors may be described as fine (6–10 muscle movements per second) or coarse (4–5 muscle movements per second). They may be caused by antipsychotics or antidepressants, withdrawal from drugs or alcohol.

TYPES OF TREMOR

At-rest tremor

At-rest tremors are worse when the affected part of the body is relaxed, supported and at rest, usually improving when the affected limb is used.

Postural tremor

Postural tremor is a fine tremor activated during attempts to sustain a posture (e.g., extending an arm, supporting a leg, holding up the head, turning back the wrists) but absent when the limb is supported and at rest.

Action (intention) tremor

Action tremors occur mainly, or are most marked, when a movement is attempted, with the result that the patient's purpose is frustrated. Hence, they are commonly tested for by asking the patient to touch the tip of his nose with the tip of his finger; as the finger approaches the nose the intention tremor increases.

Essential tremor

A persistent, fine-moderate tremor (6–10 movements per second) not associated with disease. The tremors are fine, mainly affecting the hand and head. They are common in adults, tend to increase with age and to be aggravated by emotional tension, may be temporarily relieved by alcohol, and may affect particular occupations. They may increase when the affected part of the body is moved.

¹⁹ In contrast, dystonic reactions to medication usually appear after a few doses.
²⁰ *Lexicon of Psychiatric and Mental Health Terms* (World Health Organisation, 1989), Vol. 1, pp.37–38. The term (oro-) facial dyskinesia is sometimes used to describe repetitive smacking, grimacing, champing, chewing, and swallowing movements involving the lips, tongue, and jaw.
²¹ J.D. and J.A. Spillane, *An Atlas of Clinical Neurology* (Oxford Medical Publications, 3rd ed., 1982), p.263.

Tics (habit-spasms)

A tic is a repeated, uncontrolled, purposeless contraction of a muscle or group of muscles. For example, superficially purposeless blinking, mouth twitching, shrugging, or the involuntary contraction of the diaphragm (which results in grunting noises). These habitual, spasmodic, muscular contractions tend to be experienced as irresistible, but they can usually be suppressed for varying periods of time and they disappear during sleep.²² Tics release emotional tension and are generally a sign of minor psychological disturbance, being made worse at times of stress. Occasionally, they are severe, as in Gilles de la Tourette's syndrome.

AKATHISIA (INABILITY TO SIT STILL)

Akathisia is a restless inability to sit still ("a motor restlessness") associated with a feeling of muscular quivering. It is often seen as a side-effect of neuroleptic medication or as a complication of Parkinson's disease.²³ It may be so intense that the person affected finds it impossible to sit still, day or night.

DYSTONIA (MUSCULAR RIGIDITY CAUSING SPASMS)

Dystonic means relating to abnormal muscular tension and, strictly speaking, the term encompasses both excessive or exaggerated tone and deficient or absent tone. However, in common usage, the term describes an abnormal muscular rigidity causing painful and sustained muscle spasms of some part of the body, unusually fixed postures, or strange movement patterns. Dystonic movements usually take the form of a twisting or turning motion of the neck, the trunk, or the proximal parts of the extremities. They are therefore powerful and deforming, grossly interfering with voluntary movement, and perverting posture.²⁴ **Acute dystonia** may occur as a transient complication of neuroleptic medication. **Torsion dystonia**²⁵ — torsion means twisting — is a term sometimes used to describe involuntary movements of a slow, powerful character, which produce tension and torsion spasm of the limbs and spine. The consequential abnormalities of gait may be quite bizarre.²⁶ **Wry neck** or **torticollis** (Latin for "crooked neck") is a common example of torsion dystonia. It describes a twisting of the neck which causes the head to be rotated and tilted into an abnormal position, in which it remains.²⁷

PHYSICAL SYMPTOMS AND SIGNS

Physical health problems may be real or imaginary and also the product of a person's mental state rather than its cause. A **conversion symptom** is a loss or alteration of physical functioning that suggests a physical disorder, but that is actually a direct

²² *Lexicon of Psychiatric and Mental Health Terms* (World Health Organisation, 1989), p.102.
²³ R.J. Campbell, *Psychiatric Dictionary* (Oxford University Press, 6th ed., 1989), p.24.

²⁴ J.D. and J.A. Spillane, *An Atlas of Clinical Neurology* (Oxford Medical Publications, 3rd ed., 1982).

²⁵ Torsion dystonia is also sometimes referred to as **Dystonia Musculorum Deformans** or as **Generalised Torsion Dystonia**. It is usually familial and particularly common among Jews of Russian descent.

²⁶ J.D. and J.A. Spillane, *An Atlas of Clinical Neurology*, supra, p.281 *et seq.*

²⁷ Some writers categorise writer's cramp and **blepharospasm** (the involuntary, prolonged contraction of one of the muscles that controls the eyelids, causing the eyes to close) as forms of dystonia.

expression of a psychological conflict or need. The disturbance is not under voluntary control, and is not explained by any physical disorder. **Hypochondriasis** denotes an unrealistic belief or fear that one is suffering from a serious illness despite medical reassurance.

PHYSICAL SIGNS

Nystagmus is a condition in which there is involuntary movement of the eyes, usually horizontally and in a manner resembling the action of wind-screen wipers. Occasionally, only one eye is affected. Persistent nystagmus appearing in later life usually indicates a disorder of the nervous system such as multiple sclerosis, brain tumour or an alcohol related disorder. An **oculogyric crisis** is a state of fixed gaze lasting minutes or hours in which the eyes are turned in a particular direction, usually upwards, sometimes with accompanying spasms of the head, mouth and neck. This may be drug-induced, the product of emotional stress, a sequela of encephalitis or a sign of Parkinson's Disease. **Exophthalmus** is protrusion of the eye ball and is indicative of a thyroid disorder. **Photophobia** means an uncomfortable sensitivity or intolerance to light. It is most often seen as an adverse effect of antipsychotic medication although it may be a feature of meningitis. **Blepharospasm** is the involuntary, prolonged contraction of one of the muscles that controls the eyelids, causing the eyes to close. This may be the result of photophobia, an inflammation of the eyelids, anxiety or hysteria.

Lid-lag is a momentary delay in the normal downward movement of the upper eyelids that occurs when the eye looks down. In **Lid retraction**, a rim of white sclera is seen above the iris when the patient looks ahead. Both are characteristic of hyperthyroidism. **Ptosis** is the drooping of an upper eyelid when the eyes are open.

Face is the expression of the face. Hirsuties, mooning and reddening of the face may be features of Cushing's syndrome.

As to movement disorders, see 1062.

Limbs As to movement disorders, see 1062. Truncal obesity with relatively thin matchstick legs and a buffalo-hump are classically features of Cushing's syndrome.

Trunk Psychotropic medication may cause sexual problems. Antipsychotics may be associated with enlargement of the breasts in men. In other cases, the absence of menstrual periods may be a feature of anorexia nervosa, an endocrinal disorder, Turner's Syndrome, or secondary to emotional stress or depression, or a side-effect of certain drugs.

Genitalia Skin problems are most often an adverse effect of medication. The greater the amount of melanin present the darker the colouration. Darkened skin may therefore be caused not only of exposure to the sun but by a hormonal disorder such as Addison's disease or Cushing's Syndrome. It may also be caused by an excess of other types of pigments in the blood, such as the bile pigment bilirubin (in jaundice) or iron.

Skin Pronounced weight loss is seen in eating disorders, depression, physical illness.

Weight

Disturbed sleep

Insomnia is a general term denoting dissatisfaction with the duration or quality of sleep. In depression, the sufferer commonly wakes early in the morning, often between 3am and 5am — **early morning waking**. In contrast, the tendency in anxiety states is to experience difficulty getting to sleep — **initial insomnia**. **Narcolepsy** describes short periods of sleep which occur irresistibly during the day. **Hypersomnia** means an excess of sleep, whether at night or because of periods of day-time somnolence. In manic states, the over-active individual feels a decreased need for sleep and may go several days without sleeping. **Somnambulism** means sleep-walking. More often, what a client describes as sleep-walking is in fact a **night terror**, which occurs early on during sleep. The individual imagines that there is a person at the window or that the ceiling is about to fall in and suffocate him. Feeling that he is in profound danger, he may run from the bedroom in a state of panic. On coming to, he is amnesic for the event and is initially confused about how he came to be in another room or outdoors. Some people suffering from schizophrenia may feel that other people have entered their room and that they have been violated during sleep, either sexually or in some other way. For example, the patient's hair was cut.

General appearance and physical signs

Physical signs may be pointers to the fact that the patient's mental state has an organic cause and the table on the previous page lists some of these features. The patient's physical health may also be a pointer towards his mental health in other, generally obvious, ways. There may be signs of recent physical injury, possibly sustained in the course of the suicide attempt. Superficial, multiple, lacerations of the arms and wrists are most often not indicative of attempted suicide but a way of relieving acute tension. "Track-marks" on the arms may indicate the use of injectable street drugs. What may cruelly be referred to as physical deformities are sometimes, for that very reason, relevant to the client's mental health since they carry with them a considerable psychological burden.

Self-care and self-neglect

If a patient has not washed, shaved or recently changed his clothes, or is inadequately dressed given the temperature and conditions on the ward, this may be a sign of poor self-care due to an incapacitating mental disorder. Self-neglect of this kind may be a consequence of the negative symptoms of schizophrenia, and part of a general picture of apathy, poor motivation and social withdrawal. In other cases, poor self-care may be attributable to grandiose delusions (the client has let his beard grow and cultivated a Jesus-like appearance); depression with retardation or stupor; dementia; mental impairment; and obsessive-compulsive disorders characterised by incapacitating rituals about dressing and bathing.

Other reasons for dishevelled appearance

There are, of course, many other reasons why a patient's general appearance may be poor, including poverty, the sedative effects of medication, an inefficient hospital laundry service, and the fact that no one has collected any spare clothing or toiletries for him since he was detained.

IMPAIRED MEMORY

Memory enables us to give order and meaning to the world (to classify information) and so to predict events and affect their outcomes. Learning depends on memory for its permanency while memory has no content if learning is not taking place. The capacity for new learning is sometimes referred to as "current memorising" and it has the most important clinical implications. Memory failure is a sensitive indicator of cerebral dysfunction. **Amnesia** is a general term which describes loss of memory manifested by a total or partial inability to recall past experiences. Amnesic conditions affect mainly long-term memory. The amnesia may be for events immediately prior to a head injury (**retrograde**) or for events occurring following such a trauma (**anterograde**).

Information which is committed to memory

The following kinds of information are committed to memory —

- internal perceptions or representations of events external to the brain, sometimes in a distorted form (sense data);
- internal perceptions or representations generated internally within the brain (imaginings);
- thoughts (the analysis and interpretation of sense data and imaginings);
- feelings (the emotional connotations associated with stored information).

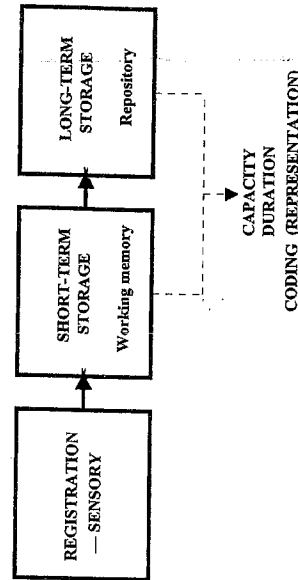
Data is therefore given a meaning and a feeling and, when recalled, may be reinterpreted: recalled events are reanalysed, rearranged or re-evaluated in light of subsequent information and restored in an amended form. The need to also record any thoughts and feelings associated with each piece of memorised information is essential to survival and learning. Not only must the sequence of events be recalled but also any information associated with it about the quality of the experience and the outcome: whether it was desirable or undesirable, whether a particular response or reaction alleviated or exacerbated the situation, and so forth. Without this, it is impossible to develop judgement and to avoid repeatedly making the same mistake and, consequently, impaired judgement is often a consequence of impaired memory. In rare cases, there may be complete indifference to a situation, as if the emotion associated with a given event has been dissociated from it.

Memorising (registering and storing information)

Memorising is the ability to register and retain what is experienced. Not everything which registers on the sense receptors is stored. About one-hundredth of the sensory information reaches consciousness and of this about one-twentieth may be stored in some form. Sensory input is retained within the immediate memory for about half a second in an essentially unanalysed form. The short-term memory allows the relevance of a limited amount of data to be evaluated, generally by reference to a framework formed by past experience. Material which is considered to be relevant

to the individual's situation is fed into the long-term memory. Information is therefore memorised at three different levels —

- Immediate memory (sensory storage). Information is held for less than a second in the form in which it was perceived before being replaced by other incoming stimuli. Sensory memory seems to be modality specific: storage occurs within the sensory system that received the information and not at some central location. Additional information entering the same sensory channel immediately disrupts the storage.²⁹
- Primary memory (short-term or working memory). Some new material is stored for evaluation in the short-term memory. Approximately six or seven items of information can be stored in the working memory for up to 20 seconds. The method used by the brain to store this information (the "code") appears to be primarily acoustic: information is converted into sound and stored in this form. Because this is so, rehearsal and repetition by mental or verbal speech — for example, repeating a telephone number to oneself or out loud — can increase the memory's duration beyond 20 seconds. Some types of schizophrenia are marked by repetition of this kind and problems emptying the working memory. As new items are added to the short-term memory, previous ones are lost, either disappearing or, where required for future use, being committed to long-term memory.
- Secondary memory (long-term memory). Some new information is fitted into an organized body of knowledge in which case a permanent trace is formed, although this may later be modified by subsequent activity. The capacity of the long-term memory store is large and such memories may endure for the rest of an individual's life. Information is stored in coded form, either semantically (verbal meaning), visually (pictorially), acoustically, or by association with previously stored information. This accounts for the predominance of hallucinations and thought disorder (e.g. loosening of associations and idiosyncratic use of vocabulary and language) in schizophrenia; and also the fact that, because little is known about the mechanisms involved in memory, little is known about that illness. Indeed, both schizophrenia and memory are hypothetical constructs.



²⁹

Remembering and recognizing things

Remembrance involves the ability to retrieve, recall and reproduce what has been learned or experienced. A new situation requiring the utilization of the information stored in the trace has to be recognized and the required information retrieved, that is isolated from the rest of the stored materials. Recognition is the awareness that something which is now happening is familiar and it involves forming associations between what is now happening and what has previously been memorised. If a person is faced with an unfamiliar fact, place or event, whether because it is new to him or because he fails to recognise that he has previously encountered essentially the same situation, he may feel perplexed or disorientated.

Memory problems

The individual's capacity to record what he is registering and to retain it, that is to store knowledge, may be divided into immediate, recent and remote memory. Immediate or short-term memory is often tested by giving the patient seven numbers and asking him to repeat them forwards and then backwards; by telling him a name and address and asking him to repeat it verbatim after a single hearing; and by giving him three objects to remember. When the long-term memory is tested, a distinction is usually drawn between "recent" and "remote" memory. Recent memory is tested by asking the patient a question about his activities during the previous 48 hours and then checking the accuracy of his account with a nurse. Remote memory involves remembering events which were memorised a considerable period ago, for instance the client's wedding day or first day at school. If a person cannot remember or accurately remember information, the problem may lie at any one or more of the stages which comprise the memory process. The inability may be due to a failure to register or store the information in the first place (no record was ever made); the loss or degradation of the record because of defective retention or an intervening decision to erase it; an inability to locate the record (the information is available but not accessible, because it was not systematically stored or cannot be systematically searched for). More particularly,

- Much information is not selected for storage because its relevance and utility are not considered to warrant this. Other events are so stressful for an individual that they are deliberately not committed to long-term memory. In yet other cases, the individual's capacity to register what is happening, that is to add to his memory store, may be reduced. This incapacity may be temporary, as where fatigue limits the amount of information which can be assimilated, or indicative of a more profound problem.
- The individual's capacity to retain and record what he is registering and to retain it may be defective. Impairment of recent memory may be an early finding in dementias.
- Certain memorised information is later forgotten. This may represent deliberate erasure following a decision that the information is no longer useful or there may be some problem retrieving and recalling stored information. Stored information will be "forgotten" if it is lost (overwritten, degraded, or inaccessible) or cannot be retrieved (squirrel phenomena).

- Information which can be retrieved may be accurately or inaccurately recalled. In other words, it may be a faithful or unfaithful reproduction of what was observed and registered. Information may be distorted or falsified because it was too emotionally charged and distressing in its original form. Whether or not conscious of the fact, the individual prefers not to remember information associated with humiliation.

- The individual may be lying. For example, a person who has committed a serious sexual offence of which he is deeply ashamed may have suppressed certain memories of it or he may be able to recall the whole event but prefer to edit what information he imparts to others.
- Lying (deliberate falsehood) must, however, be distinguished from guessing and **confabulation**. Confabulation involves filling in deficits in memory with false responses or information. It differs from lying in that the person is not consciously attempting to deceive. Confabulation may be a feature of amnesic syndromes such as Korsakoff's syndrome and dementia.

MOOD, AFFECT AND EMOTIONAL STATES

Affect is the way in which a person is emotionally affected by an idea or perception. However, some psychiatrists use the words affect and mood interchangeably while others use "mood" as a term for the prevailing emotional tone (equivalent to affect), referring to the underlying, sustained, mood as the "mood state." Some simply lump together every kind of emotional distress (depression, elation, anger, irritability, panic, fear, anxiety) under the general rubric of "the patient's mood." The approach taken here is to restrict the term mood to states of depression or elation; the term affect to emotional responsiveness; and to deal with other emotions, such as anger, separately. This is because many of these other emotions may or may not be associated with depression or elation and are commonly seen in people whose mood, as defined, is normal.

AFFECT

A person's affect is how he appears to be emotionally affected by an idea or perception. For example, he seems happy, sad, or indifferent. A person whose mood is normal may nevertheless be profoundly affected emotionally by some idea or perception. Psychiatrists are particularly interested in whether a person's emotional responsiveness is impaired. Affect is often described as being **flat** (absent or very limited emotional range); **blunted** (severe lack of normal emotional sensitivity); **shallow or restricted** (reduced); appropriate, harmonious or **congruous**; inappropriate or **incongruous**; or **labile** (unstable). Incongruous affect describes the incongruity between what a person is saying and his affect. For example, a patient laughs or displays no concern when recounting how his imaginary persecutors intend to kill him. **Apathy** is emotional indifference and, as such, it is virtually indistinguishable from flat or blunted affect. It is common in depression and certain forms of schizophrenia although resignation, rather than true indifference, often

better describes the patient's lack of responsiveness. Apathy may therefore be distinguished from the hopelessness which is often the final stage of depression and also from **La Belle Indifference** (literally, "beautiful indifference"), a sublime resignation to distressing symptoms which are the product of hysteria.

MOOD

Mood is the pervasive and sustained emotion which colours an individual's whole personality and perception of events. Consequently, it is sometimes described as sustained affect and mood disorders may inaccurately be said to involve a morbid change of affect. The expression **euthymic mood** describes a normal or equable mood. Inferences about mood generally stem from present observations and past events.

Heightened mood

Various words are used to describe the features of heightened mood, many of them essentially interchangeable. **Hypertymia** is a tendency to be overcheerful and unrealistically optimistic. **Elation** consists of feelings of euphoria, triumph, immense self-satisfaction or optimism. **Euphoria** is an exaggerated feeling of physical or emotional well-being seen in organic mental states and in toxic and drug-induced states. **Exaltation** is an excessively intensified sense of well-being seen in manic states. **Ecstasy** describes a state of elation beyond reason and control or a trance state of overwhelming (often religious) fervour. **Grandiosity**, although not usually bracketed with mood, describes feelings of tremendous importance, characterised by an inflated appraisal of one's worth, power, knowledge, importance, or identity, and commonly expressed as absurd exaggerations. Extreme grandiosity may attain delusional proportions and is seen in mania and schizophrénia.

Depressed mood

Dysthymia is a long-standing tendency to be sad and miserable and a person with this outlook on life is sometimes said to have a **dysthymic personality**. **Depression** describes feelings characterised by sadness, apathy, pessimism and a sense of loneliness. **Melancholia** is simply the Latin word for melancholy and is essentially synonymous with depression. **Anhedonia** is a feature of depression and refers to an inability to experience pleasure in acts that normally are pleasurable.

Fluctuating Mood

Cyclothymia, a term invented by Kahlbaum, describes a personality characteristic typified by marked changes of mood (cyclothymic personality). **Lability of mood** is emotional instability, a rapidly changing mood. The person affected may laugh one minute and cry the next without there being any corresponding change in external stimuli to account for that.

Inappropriate mood

Mood-congruent psychotic features are delusions or hallucinations the content of which is entirely consistent with the individual's depressed or manic mood. Thus, if the individual's mood is depressed, the content of the delusions or hallucinations involve themes of personal inadequacy, guilt, disease, death, nihilism, or deserved punishment. Likewise, if the mood is manic, their content involves themes of

inflated worth, power, knowledge, identity or special relationship to a deity or famous person. Conversely, **mood-incongruent psychotic features** are delusions or hallucinations the content of which is inconsistent with either a depressed or a manic mood. If a distinction is drawn between a person's affect and his mood, the patient may instead be described as having an incongruous or inappropriate affect.

OTHER EMOTIONAL STATES

Many other terms are used to describe an individual's emotional state, among them anxiety, fear, agitation, restlessness, panic, and irritability. The customary distinction between the first two of them used to be that fear always had an object (whether a situation or thing) whereas anxiety was fear without an object or dread. Unfortunately, the current definitions of anxiety in the international classifications have eroded this useful distinction.

Anxiety

Anxiety is characterised by an apprehension, tension, or uneasiness that stems from the anticipation of danger. The associated symptoms include tachycardia (abnormal rapidity of heart beat), palpitations, breathlessness, and light-headedness. Both of the main international classifications distinguish between anxiety which is tied to or focused on some particular situation (**specific anxiety**) or object (**phobia**) and generalised anxiety where no such external triggering factor is apparent (**free-floating anxiety**). The ICD classification also distinguishes between **trait anxiety** and **state anxiety**, the former being an enduring aspect of personality and the latter a temporary disorder.

Fear

Phobia denotes a persistent irrational fear of, and desire to avoid, a particular object or situation. In **Agoraphobia**, the fear is one of going into open spaces and of entering public places: the patient is filled with dread at the prospect of venturing out of his home and may experience panic attacks. In some cases, what initially seems to be agoraphobia may transpire to be **claustrophobia** (a fear of enclosed spaces). Thus, a patient may not venture out of his home because of the suffocating, claustrophobic, effects of being in a crowded shopping centre rather than because of a fear of open spaces. If the individual has a chronic abnormal fear that he is ill or diseased, this is termed **hypochondriasis**.

Irritability

Anxiety may be expressed as irritability. The depressed patient may become anxious about his inability to respond positively to the problems surrounding him, which makes him anxious and often increasingly irritable. Conversely, sustained, unremitting anxiety and irritability have a depressive effect over a period of time because the individual's performance is constantly undermined and dejection sets in.

Agitation and restlessness

In other cases, uncontrollable anxiety or fear surface in the form of motor restlessness (agitation) which, as with tics, both reflects and appears to partially alleviate the underlying state of tension. The ICD classification reserves the term "agitation" for

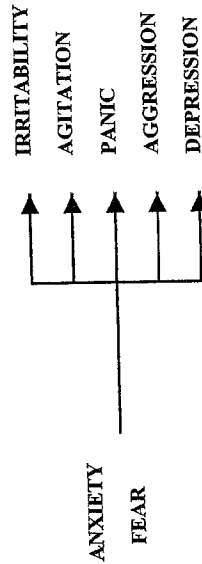
cases where anxiety is accompanied by "marked restlessness and excessive motor activity" — states referred to in the DSM classification as **psychomotor agitation**. There is a restless, usually non-productive and repetitious, inability to keep still as a result of the underlying tension. The patient may pace up and down, pick at his clothes or skin, be unable to concentrate or relax and so start but not complete various tasks. In severe cases, there may be shouting or loud complaining. Restlessness caused by certain drugs may mimic agitation (see akathisia, 1067).

Panic

A further way of dealing with anxiety or fear is to attempt to repress it. Anxiety or fear may surface in discrete periods of sudden onset and be accompanied by physical symptoms — panic attacks. A **panic attack** is a sudden, overwhelming anxiety or fear, sometimes accompanied by an intense fear of dying and associated with particular times, places, thoughts or ideas. Hyperventilation occurs with fast, shallow, breathing and a range of other physical symptoms.

Aggression and hostility

Fear may lead to aggression and hostility. Biologically, aggressiveness is a component of animal behaviour which is released in particular conditions in order to satisfy vital needs or to eliminate an environmental threat. In the case of patients who are irrationally fearful, aggression and hostility perform the same function as in cases where there is an objectively real threat to the individual's safety. The individual attempts to eliminate fear by eliminating its cause.



DISORDERED SPEECH OR THOUGHT

Thinking is a form of activity engaged in by a biological organism whenever habitual patterns of action are disrupted and the function of thought is to solve the problems which give rise to it.³⁰ An individual's thoughts may be kept private or expressed. Expression may be verbal or non-verbal. A thought may be expressed non-verbally by an action, an omission to act, a bodily movement such as a grimace or gesticulation, or a display of emotion such as anger. The movement of muscles to produce speech is an activity, a form of behaviour, just as much as is the movement

of muscles in the limbs to produce motion or to perform some physical act. Unless thoughts are deliberately concealed, or their articulation is impaired by a poor vocabulary or damage to the mechanics involved in producing speech, its flow and content correspond to the flow of the individual's thoughts, so that disordered speech frequently reflects disordered thought. More particularly, "we are subjectively aware of our thought process being a stream or a flow ... thoughts are capable of acceleration and slowing, of eddies and calms, of precipitous falls, of increased volume of flow, of blockages."³¹ The point, though obvious, is nevertheless important because it focuses attention on the fact that many of the terms used to describe abnormal thought processes on the one hand and abnormal speech on the other are for all practical purposes synonymous. Thus, while some textbooks refer to paucity of thought, one can just as well say that the patient's presentation is marked by poverty of speech if the former conclusion is based only on his observed speech output. If a person's speech is abnormal, this may be because the amount of speech is outside normal bounds; because the production of speech is impaired; because his choice of words is abnormal; because the succession and connection of ideas is illogical; or because its content is abnormal. That being so, abnormalities of speech and thought are dealt with in the following order—

- Abnormal volume (amount) and rate (tempo) of speech
- Abnormal delivery of speech (articulation)
- Abnormal choice or use of words (vocabulary)
- Abnormal juxtaposition of words, or the ideas conveyed by them, in phrases and sentences (syntax and the association of ideas)
- Abnormal content of thought (delusions, over-valued ideas, etc.)

THE VOLUME (AMOUNT) AND RATE (TEMPO) OF SPEECH

The amount of speech used may be excessive or restricted. In extreme cases, an individual may be mute or talk incessantly. When seeking to establish the cause of this, it is important to establish whether the amount of speech varies according to the subject under discussion and whether the structure of speech is normal or its rhythm or inflexion disturbed. Due allowance must be made if English is not the patient's usual language and for other factors influencing communication, such as sedating drugs.

No speech or little speech which is slow and laboured

Retarded thought (thinking which proceeds slowly towards its goal) is reflected in the individual's speech and when the amount of speech is very limited this is sometimes referred to as **poverty of speech**. In extreme cases, the patient is mute, being either unable or unwilling to speak. **Mutism** may be seen in cases of catatonic schizophrenia and severe depression. The term **akinetic mutism** describes a state of disturbed consciousness due to a tumour of the third ventricle, as a result of which the patient is mute and almost totally unresponsive. **Aphonia** is a total loss of the

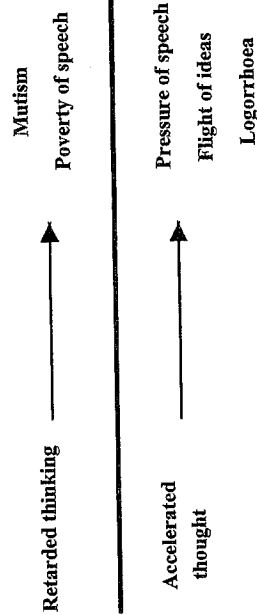
³⁰ See J. Dewey, *Experience and Nature* (Open Court, 1925).

³¹ A. Sims, *Symptoms in the Mind* (Baillière Tindall, 1988), p.108.

voice which cannot be accounted for by any disease or injury - the larynx ("voice-box"). It is usually sudden in onset and caused by emotional stress.

Speech is fast, rapid, accelerated

Copious, excessive, production of speech is known as volubility or **logorrhoea**. It may be seen in mania or schizophrenic disorders. Where the amount and rate of a patient's speech is increased so that he is difficult to interrupt, this is referred to as **pressure of speech**. In **flight of ideas**, there is a nearly continuous flow of accelerated speech with no central direction. The patient jumps from one topic to another, his stream of thought directed by chance associations between each fragment of conversation. In some cases, this flitting from subject to subject may be determined not by any logical relationship or progression in terms of subject-matter or meaning but by the way words rhyme or by similarities in sound — **clang associations** or **clanging**.



THE DELIVERY OF SPEECH (ARTICULATION)

Whether or not the volume and velocity of thought and therefore speech is normal, its delivery may nevertheless be abnormal. For example, the individual may stammer or stutter, that is show repeated hesitation or delay in uttering words. **Dysarthria** (disturbed articulation) is difficulty in speech production caused by disease or damage to the physical apparatus of speech or to the nerve pathways controlling that apparatus; it is the vocal expression which causes problems. **Dysarthria** is a common feature of many degenerative conditions such as multiple sclerosis, Parkinson's disease and Huntington's chorea, and it may a side-effect of prescribed medication (e.g. tardive dyskinesia). In other cases, the cause may be more mundane, for example alcohol intoxication or ill-fitting dentures.

Dysphonia

Dysphonia has a more restricted meaning than dysarthria and refers only to defects of sound production caused by some disease or damage to the voice-box (larynx) or to the nerve supply to the laryngeal muscles. In cases of depression, the patient may speak with a monotonous voice while manic patients often talk in a particularly animated way.

THE CHOICE OF WORDS AND VOCABULARY

The way certain words or phrases are used may sometimes be distinctive, because they are repeated, or clearly have a special significance for the individual, or represent words which he has invented. More generally, their usage may suggest a limited vocabulary and hence limited education, limited innate intellectual ability, loss of intellectual ability (e.g. dementia), or a poor grasp of the language in someone for whom English is not their first language.

Descriptive terms

Echolalia, verbigeration and perseveration describe different kinds of repetition of words and phrases—

- **Perseveration** denotes the persistent repetition of words, phrases or ideas. The initial thought, or train of thought, is maintained despite a change of topic, as in the following example: "Q. What is your name? "A. John Smith. Q. Where do you live? "A. John Smith." Perseveration is most commonly seen in organic mental disorders, schizophrenia, and other psychotic disorders.
- Where the patient instead persistently repeats back a syllable, word or phrase spoken by the interviewer, rather than a word or phrase previously spoken by himself, this is known as **echolalia**. Typical echolalia tends to be repetitive and persistent. The other person's tone and accent may also be echoed, often with a mocking, mumbling, or staccato intonation. Echolalia may occur in cases of schizophrenia, autism, mental impairment, or organic disorder.
- **Verbigeration** is the stereotyped and superficially meaningless repetition of words or sentences, which is not an echoing of something said to the patient.
- Where a patient uses a certain *word or phrase* repeatedly throughout a conversation, such that it is clear that it has a special importance or meaning for him, such phrases are known as **stock phrases**.
- A **neologism** is a new word invented by the patient, often a portmanteau. For example, the word "bancid" may be an amalgam of the words "bad" and "rancid." Neologisms may be observed in schizophrenia and other psychotic disorders.
- Neologisms should be distinguished from the situation where a patient has difficulty finding the correct word or where he uses a known word in an idiosyncratic and not entirely correct way (**metonyms**).
- The term **coprolalia** describes the repeated *involuntary* utterance of socially unacceptable or obscene words and it is sometimes seen in de la Tourette's syndrome. However, most often, the repeated use of swear words and other obscenities is simply voluntary or habitual, a sign of poor social upbringing rather than mental disorder.

Language disorders

A patient's choice of words, or his inability to remember a word, may in rare cases form part of a more pervasive cerebral disorder and be associated with impaired capacity to read or write. **Aphasia** is, strictly speaking, a complete loss of the ability to select the words with which to speak and write caused by damage to the regions of the brain concerned with speech and its comprehension. **Dysphasia** denotes a disturbance rather than a complete absence of these previously acquired language skills. There are several types of aphasia but no agreement as to how to classify them. **Agraphia** is caused by damage to the cerebrum and signifies a loss or impairment ability to write in a person whose hand and arm muscles function normally. **Agaphia** usually occurs as part of aphasia or, rarely, by itself. **Alexia** (word-blindness) denotes an inability to recognise and name written words in a person who was previously literate, the disorder being caused by damage to the cerebrum. Most often, such alexia occurs as part of aphasia.

THE STRUCTURE AND FORM OF THOUGHT

Minor defects in the form or structure of spoken thoughts may be attributable to inadequate education, fatigue, anxiety, boredom, frustration, or intellectual impairment. Broken or fragmented speech may similarly merely demonstrate a lack of command of English in someone for whom English is not their first language. However, in some cases, the patient's answers suggest that his thought processes are so disturbed that he cannot grasp the point of the question. Alternatively, the way in which words are formed into sentences may be highly idiosyncratic, the successive ideas conveyed by them being conjoined to form phrases or sentences which have little logical connection. They do not appear to form a chain of reasoning.

Failure to grasp the purpose of a question

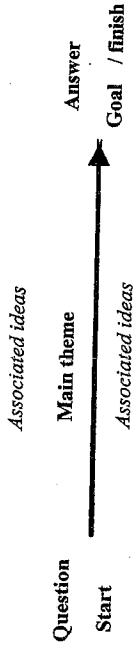
Even though a question is simply expressed and unambiguous, it may be apparent that the other person has not understood its meaning or purpose, that is the information which it was intended to elicit. This may be because the person has interpreted the question too literally and is capable of thinking only in concrete terms — **concrete thinking**. Concrete thinking is seen in schizophrenia and it is characterised by literalness, an inability to abstract or to form the whole from its parts.

Rational or conceptual thinking

Rational or conceptual thinking involves the use of logic to solve problems. It involves recognizing and classifying a problem so that reason can be applied to find a solution.³² All reasoning represents a logical association of ideas. The thoughts and ideas developed in a patient's answer may flow logically in that there is an obvious connection or "association" between an expressed idea and the thoughts immediately preceding and following it. Conscious thinking therefore has a goal towards which clear and relevant thoughts move. Along the fringe of this main theme (determinative idea) are numerous less clearly defined thoughts or associations running parallel to the main theme.³³

³² A. Sims, *Symptoms in the Mind* (Baillière Tindall, 1988), p.107.

³³ *Ibid.*, Chap. 8.



Loosening of associations

It is sometimes the case that there is no logical association between the various thoughts expressed in response to a question. The successive thoughts, sentences and topics are not obviously goal-directed or connected in a chain of thought. The patient fails to answer the question posed. This lack of association may vary in its severity. Marked inability to consciously develop a chain of thought is considered to be indicative of mental disorder and, more particularly, a key feature of schizophrenia. The terminology used to describe disturbed association of ideas is, however, not firmly established. For example, some psychiatrists use the term loosening of associations or tangentiality of thought to refer to any inability to arrange successive ideas in order, whatever the severity of the disturbance. Subject to this caveat, disturbed associations between ideas may be categorised as follows—

- In its mildest form, conversation is vague and answers to questions "woolly." **Tangentiality** means replying to a question in an oblique or even irrelevant manner.
- In some cases, there is such a loose connection between the successive thoughts expressed by successive sentences that the goal is never attained — **loosening of associations**. Successive thoughts are either unrelated or only obliquely related although the speaker is unaware that the statements which he is juxtaposing lack any meaningful relationship. Loosening of associations therefore represents a disturbance in the association of thoughts which renders speech inexact, vague, diffused or unfocused. The term **knight's move thinking** is also sometimes used to describe such odd, tangential, associations between ideas.
- When loosening of associations is severe, speech may be incoherent. The speech is mostly not understandable owing to a lack of any logical connection between words, phrases, or sentences; the excessive use of incomplete sentences; excessive irrelevancies or abrupt changes in subject matter; idiosyncratic word usage; and distorted grammar. **Incoherence** may be seen in organic mental disorders and schizophrenia but the term is not used if abrupt shifts in topics are associated with a nearly continuous flow of accelerated, manic, speech. This is referred to as **flight of ideas**.
- At its most severe, not only is there no logical association between successive thoughts but a lack of association between successive words, which form a meaningless jumble. This is known as **word salad**.

Circumstantial thought

By convention, a distinction is drawn between loosening of associations and circumstantiality of thought. Circumstantial thought describes speech which, although relevant to the subject being discussed and eventually answering the question is indirect and delayed in reaching the point because of unnecessary, tedious details and parenthetical remarks. Circumstantial replies or statements may be prolonged for many minutes if the speaker is not interrupted and urged to get to the point. Circumstantial thought is also differentiated from **poverty of ideas** in which speech conveys little information because of vagueness, empty repetitions, or use of stereotyped or obscure phrases: the individual speaks at some length but commonly does not give adequate information to answer a question.³⁴

Thought blocking and derailment of thoughts

Loosening of associations is further distinguished from thought blocking and derailment of thought although all affect the patient's ability to follow through a chain of ideas. In **derailment of thought**, there is a sudden deviation in the train of thought, as if a train travelling from one station to another (here from question to answer) had been derailed. In **thought blocking**, the patient's stream of thought, and therefore speech, suddenly stops in mid-flow for no obvious reason. He is either unable to account for the stoppage or attributes it to his thoughts being interfered with by a third party. Such blocking of this kind differs from mere reticence or defensive thought. Thought blocking of this kind differs from the structure of his speech is normal and less. If a person is simply being defensive, the structure of his speech is touched upon that any significant hesitancy or pause is apparent in midstream. The patient may at the same time become aroused, anxious, quiet or elevated.

THE CONTENT OF THOUGHT (BELIEFS AND IDEAS)

Even if the structure and form of a person's thought, and therefore speech, appears normal nevertheless the ideas expressed by him (the content of his thought) may be markedly abnormal. When a person has a thought, an idea, he means that he is conscious of having it. Thoughts of which a person is conscious may or may not be verbalised and they may be memorised or forgotten.

Beliefs, ideas and feelings

A belief is a thought which is considered by its holder to have an explanatory value so that the relevance of other thoughts and perceptions is determined by reference to it and the framework which it forms together with the individual's other beliefs. It is therefore an idea which, having been submitted to scrutiny in the light of available evidence, is deemed to account for observed phenomena and so to have an explanatory and predictive quality. An **idée fixe** is an unshakable preconception or conviction. A "feeling" is a sub-conscious, or barely conscious, thought which is evoked by another thought or perception (something seen, heard, touched, or smelt) but cannot be put into words. A suspicion is a feeling or an idea falling short of a belief that some other person intends to harm the individual or his interests. This commonly leads to reticence, guardedness, defensiveness or secrecy on the individual's part.

³⁴

A. Sims, *Symptoms in the Mind* (Baillière Tindall, 1988), p. 134.

Delusions

In some cases, a belief may be so obviously false and irrational that it constitutes a delusion. A delusion is a belief which is bizarre; not true to fact; cannot be corrected by an appeal to reason; and is out of harmony with the holder's educational or cultural background. The fact that it is manifestly inconsistent with beliefs which the individual is known to have previously held, although not a defining feature, is often the firmest conclusive evidence that the belief is delusional.

Systematised delusions

Delusional ideas may be fleeting in nature, changeable and unconnected with each other — **unsystematised delusions** — or they may form part of a logical fixed system of such beliefs — **systematised delusions**. An example of the latter is that of a man who, having failed his bar examination, developed the delusion that this occurred because of a conspiracy involving the university and the bar association. He then attributed all other difficulties in his social and occupational life to this continuing conspiracy.

Whether delusions are evidence of disordered thought processes

Opinion varies as to whether the holding of a delusional belief is in itself evidence of disordered thought processes. On the one hand, a delusional belief may represent a logical conclusion given the sensory information which that part of the brain involved in interpreting sensory data believes it has received "in its in-tray" for actioning. In this context, one may take the example of a person who "hears" a neighbour's voice, indistinguishable from that person's real voice, discussing how to poison him. Arguably, the belief that the neighbour is trying to harm him is a logical conclusion to reach on the available "evidence." Against this, many delusional beliefs are clearly based on illogical thinking. Thus, the logic of a patient who writes to the Prime Minister about some political crisis which is then resolved is clearly disturbed if he draws the conclusion that his personal intervention was responsible for the change in Government policy. There are endless variations on the theme but they all involve drawing conclusions from false premises: A writes to B about an event and the event takes a different course. A ascribes the change to his intervention. Alternatively, A writes letter B and learns that C has written to D and forms association between events A and C or between himself and the writer of letter C — **paralogic thinking**. Even here it may be argued that such delusional "ideas" are logical given the prior existence of a primary grandiose delusional "belief" about one's own importance, a belief which then provides the framework for future ideas and reasoning.

Autistic thinking

In many cases, the beliefs which provide such frameworks are the product of what Bleuler called **autistic thinking**: a form of thinking characterised by a turning away from reality, uncommunicativeness, and an excessive indulgence in fantasy. The individual is preoccupied with an inner, private world and, although this gratifies his various unfulfilled fantasies, it results in a total disregard of reality. As a result, his ability to relate to other people and his environment is markedly impaired. The mode of thought which originally compensated for the disappointments of life, by reinventing reality, becomes an established way of life.

Classification of delusions

Delusions are commonly categorised according to their content (e.g. grandiose delusions); whether or not they are systematised; whether they are mood-congruent or mood-incongruent (1074), and whether they are primary or secondary. With regard to the latter, a hallucination may give rise to a "secondary" delusional belief that the perception is true; it was "so real, it must be true." If the delusion cannot be related to some prior event it is said to be primary or "autochthonous."

COMMON DELUSIONAL THEMES

- Delusion of being controlled* A delusion in which feelings, impulses, thoughts, or actions are experienced as not one's own but imposed by an external force.
- Delusion of guilt* A delusional belief that one is sinful or wicked or responsible for certain distressing events, e.g. that one is responsible for the suicide of another patient. Guilt is self-inflicted, in contrast to shame which primarily depends upon the opinion others are perceived to have of the individual.
- Delusion of infestation* A tactile hallucination involving the sensation of something creeping or crawling on or under the skin may give rise to a secondary delusion of being infested by insects or worms.
- Delusion of poverty* A delusion that the person is, or will be, bereft of all, or virtually all, material possessions.
- Delusion of reference* A delusion that events, objects, or other people in the person's immediate environment have a particular and unusual significance, usually of a negative or pejorative nature. If the delusion of reference involves a persecutory theme, then a delusion of persecution is present as well.
- Delusional jealousy* The delusion that one's sexual partner is unfaithful. Also known as "Othello's syndrome."
- Grandiose delusion* A delusion the content of which involves an exaggerated sense of one's importance, power, knowledge, or identity. It may have a religious, somatic, or other theme.
- Nihilistic delusion* A belief that oneself, others, or the world no longer exist. Often present in very serious depressive disorders.
- Persecutory delusion* A delusional belief that the patient himself, or some other person, institution, or group, is being attacked, harassed, cheated, persecuted, or conspired against. In cases of paranoid schizophrenia, such beliefs may be associated with related psychotic phenomena, such as auditory hallucinations or passivity phenomena.
- Somatic delusion* A delusion pertaining to the functioning of one's body, e.g. a false belief that one is pregnant despite being post-menopausal.

Delusional beliefs about interference with thoughts

The central theme of the following delusional beliefs is the belief that the individual's thought processes are being interfered with by some other person or force —

- **Thought control** describes a belief that one's thoughts are being controlled by some other person, persons, or outside forces.
- **Thought insertion** is a delusion that thoughts have been, or are being placed, in one's mind by some other person, persons or outside forces. These intrusive thoughts are experienced by the patient as alien. One of Schneider's first-rank symptoms of schizophrenia.
- **Thought withdrawal** is when the individual experiences his own thoughts being withdrawn from his mind or otherwise appropriated by an external agency.
- **Thought broadcasting** is the belief that one's own thoughts are being broadcast to the outside world or otherwise made public knowledge.

The individual therefore believes that his thoughts are being controlled, infiltrated, poisoned, stolen or made public. Apart from the central idea of interference with thought processes, it can be seen that these beliefs have two other aspects in common. Firstly, the nature of the delusions are essentially paranoid since they are characterised by a belief that the individual is being harmed by some other person or agency. Consequently, there is a significant potential for violence to any individual thought to be involved in causing this harm. Secondly, and to some extent like all paranoid delusions, the beliefs are characterised by passivity. External agencies have managed to penetrate the individual's mind. The boundaries between the inner and outer world have been breached, not only external events but his own inner thoughts are no longer under his own control. **Thought blocking (1082)** may give rise to the delusional explanatory idea that this blockage is due to interference with the subject's thoughts.

IDEAS FALLING SHORT OF BEING DELUSIONAL BELIEFS

In most cases, it is clear whether or not an idea is delusional in nature. However, care must be taken to differentiate such ideas from value judgements, over-valued ideas and, more particularly, ideas of reference.

Value judgements

According to the DSM glossary, when a false belief involves an extreme value judgement, it is regarded as a delusion only when the judgement is so extreme as to defy credibility. If someone claims he or she is terrible and has disappointed his or her family, this is generally not regarded as a delusion even if an objective assessment of the situation would lead observers to think otherwise; but if someone claims he or she is the worst sinner in the world, this would generally be considered a delusional conviction.

Thoughts disproportionate (over-valued ideas)

An over-valued idea is an unreasonable, sustained, idea which is maintained less firmly than a delusional belief. It differs from an obsessional thought in that the person holding the overvalued idea does not recognise its absurdity and thus does not struggle against it. **Ideas of reference** are one kind of over-valued idea and the term denotes an incorrect idea that casual incidents and external events directly refer to oneself which stops short of being a delusion of reference (1084).

OTHER ABNORMAL THOUGHTS

Apart from delusions, a person's thoughts may be abnormal in a number of other ways which have already been considered. An **obsessional thought** (1062) is one which a person cannot prevent himself from repeatedly, insistently, having albeit that the content of the thought is not delusional. A **phobia** (1075) is a morbid, persistent and irrational fear of, and desire to avoid, a particular object or situation, associated with extreme anxiety.

PERCEPTUAL DISTURBANCES

A person may be unable to perceive or recognise something which one would normally expect him to be able to sense. For example, an individual cannot recognise objects despite adequate sensory information about them reaching the brain via the eyes, ears or through touch — **agnosia**. For an object to be recognised, the sensory information about it must be interpreted, which involves the recall of memorised information about similar objects. **Agnosia** is caused by damage to the areas of the brain involved in these interpretative and recall functions and may occur following head injury or a stroke. It is, however, rare. More commonly, perceptual disturbances involve an individual seemingly perceiving something which is not there.

HALLUCINATIONS

An hallucination is a sensory perception occurring without external stimulation of the relevant sensory organ. A hallucination has the immediate sense of reality of a true perception. Hallucinations are usually categorised according to the sensory modality in which they occur and there may or may not be a delusional interpretation of the hallucinatory experience. For example, a person experiencing auditory hallucinations may, or may not, recognise that the voices are imaginary. If he does not and he is convinced that the source of his sensory experiences has an independent physical reality, the hallucination has given rise to a secondary delusion. Transient hallucinatory experiences are common in people without mental disorder and many people experience auditory or visual hallucinations while falling asleep (**hypnagogic perceptions**) or awakening from sleep (**hypnopompic perceptions**). Everyone has experiences akin to hallucinations during sleep (dream images).

Auditory hallucination

An auditory hallucination is a hallucination of sound, most commonly of voices. Auditory hallucinations may be organised — commenting or commanding — or

elementary, such as a buzzing sound, fragments of music, or the sound of a telephone or door-bell. Auditory hallucinations which consist of hearing voices are often described as being in the first-person ("I am wicked"), in the second-person ("you are wicked"), or in the third-person ("he is wicked"). **Thought echo** is the experience of one's thoughts being repeated or echoed (but not spoken aloud) within one's head: the repeated thought, though identical in content, may be felt as slightly altered in quality. Echoed thoughts of this kind may be harbingers of auditory hallucinations.

Distortions of real perceptions

Auditory phenomena which are not classifiable as hallucinations may nevertheless be significant. For example, a patient with temporal lobe epilepsy may experience a sound as suddenly very remote and distant, or alternatively suddenly very loud, perhaps as loud as thunder.

Gustatory hallucination

A gustatory hallucination is an hallucination of taste, such as a metallic taste, often accompanied by chewing, lip smacking or swallowing movements. Gustatory hallucinations have great significance for the diagnosis of temporal lobe epilepsy. In cases of paranoid schizophrenia, the patient may imagine that his food is being poisoned or tampered and this belief give rise to a vague idea that the food is odd in some way. However, there is rarely an hallucination as such.

Olfactory hallucination

An olfactory hallucination is one involving smell and, again, it has great significance for the diagnosis of temporal lobe epilepsy. In such cases, the smell is typically described as being similar to burning rubber or burning cabbage.

Somatic hallucination

A somatic hallucination is an hallucination involving the false perception of a physical experience localised within the body. For example, a perception that electricity is running through the body. Somatic hallucinations are often distinguished from **tactile hallucinations**, in which the sensation is usually related to the skin, and **kinaesthetic hallucinations**, where the sensation relates to the muscles or joints.

Tactile or haptic hallucination

A tactile or haptic hallucination involves the sense of touch, often something on or under the skin. Almost invariably, the symptom is associated with a delusional interpretation of the sensation. For example, a person may say that the devil is sticking pins into his flesh. **Formication** (formica being the Latin word for an ant) is a particular kind of tactile hallucination, involving the sensation of something creeping or crawling on or under the skin. It may be a feature of schizophrenia or withdrawal from alcohol, cocaine or morphine. There is often a delusional interpretation of the sensation, which may be attributed to insects or worms — **delusion of infestation**.

Paraesthesia

Parietal seizures may produce numbness, tingling, feelings of heat and cold. The seizures may then spread to contiguous areas of the body and even produce pronounced disorders of body image.

Visceral hallucination

A visceral hallucination is literally an hallucination involving one of the organs situated within the chest and the abdomen although the term is commonly used to describe sensations affecting other bodily organs, e.g. a person senses that water is dripping in his brain.

Visual hallucination

A visual hallucination is an hallucination involving sight. Visual hallucinations may be sub-divided into those which are elementary or simple, such as flashes of light, and those which are organised, such as the form of human figures. Elementary visual hallucinations may be suggestive of an organic disorder. A scotoma³⁵ may occur or, more commonly, elementary hallucinations consisting of flashes of light, colours, zig-zag patterns and radiating spectra. Occipital seizures may commence as visual disturbances localised in the half-field of vision opposite to the side affected. One view is that the visual hallucinations of schizophrenia are experienced as often during the day as at night whereas such experiences are more common at night in mood or organic disorders.

Illusions

Visual hallucinations must be distinguished from illusions and also from normal thought processes that are exceptionally vivid. An illusion is a mental impression of sensory vividness arising out of a misinterpretation of an external stimulus. For example, mistaking a piece of crumpled cotton for a spider or a cat for a rat. They are therefore misperceptions or misinterpretations of real stimuli, in contrast to an hallucination when any external stimulus which may account for the perception is absent. Illusions may be caused by anxiety, panic, tiredness, certain drugs or damage to the brain.

Micropsia and macropsia

A Lilliputian hallucination is a visual hallucination in which the hallucinated visual material appears very small. This is different from micropsia in which actual objects appear smaller than normal.³⁶ Macropsia is a false perception that an actual object is larger than it really is. It may occur following drug intoxication or as a feature of temporal lobe epilepsy.

PERCEPTIONS OF TIME, SPACE, PLACE AND SELF

A number of other sensations not classified as hallucinations relate to the individual's orientation — his perception of himself in relation to time, space, and place — and result in a feeling of disengagement from the world or disorientation. A person

³⁵ An abnormal blind spot in the visual field.

³⁶ W.A. Lishman, *Organic Psychiatry. The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987), p.219.

with schizophrenia or temporal lobe epilepsy may describe time passing extremely slowly or rapidly. He may say that half an hour passed in a matter of seconds or that he was aware of beginning to prepare a meal and the next moment the food was cooked and ready on the table. **Depersonalisation** is an alteration in the perception or experience of one's self so that the feeling of one's own reality is temporarily lost. It may include the feeling that one's extremities have changed in size, or a sense of seeming to perceive oneself from a distance (usually from above). Such experiences may be the product of stress, anxiety or tiredness, a side-effect of medication, a symptom of temporal-lobe epilepsy or schizophrenia. Depersonalisation is frequently accompanied by, but should be distinguished from, **derealisation**. Here, the individual concerned does not feel that he himself is unreal, rather the world around him is experienced as unreal. **Déjà-vu** is a false feeling that what one is seeing (a place or person) has been seen previously while **jamais-vu** is a feeling that one has never before seen that which has previously been seen. **Déjà-entendu** is a false feeling that what is being heard has been heard before while **déjà-pensé** is a false feeling that a new thought has been previously experienced or conceived.

SPECIAL ASSESSMENT PROCEDURES

Certain routine tests should ideally "be performed on all psychiatric in-patients, including estimation of haemoglobin, erythrocyte sedimentation rate, serological tests for syphilis, chest X-ray and routine urine examination. The patient's temperature should ... be taken, sometimes with four-hourly recording, if minor rises are suspected. These serve as screening tests for coincidental as well as causally related physical disorders. Other investigations will be indicated on the basis of the history and clinical examination when specific disorders are suspected.³⁷ Because the vast majority of symptoms found during a mental state examination can be features of a number of mental disorders, the initial diagnosis is often only provisional, or at least should be. A number of possible alternative diagnoses (**differential diagnoses**) may well be noted. The presumption that all seriously disabling forms of mental disorder have underlying structural or biological causes has led to attempts to develop investigative tests which can eliminate some of this uncertainty and provide greater diagnostic accuracy. The mental state examination aside, assessment procedures include physical examination, laboratory tests (**1091**), EEGs and lumbar puncture (**1099**), the use of psychiatric rating scales and psychological tests (**1104**), and behavioural analysis involving the use of behaviour charts. The purpose of a diagnostic test is to move the estimated probability of disease toward either end of the probability scale, thereby providing information that will alter subsequent diagnostic or treatment plans.³⁸

THE DIAGNOSTIC VALUE OF SPECIAL INVESTIGATIONS

It is sometimes said that "true" disease status is determined by the most definitive diagnostic method, commonly referred to as a gold standard. For example, the gold standard for breast cancer diagnosis is histopathologic confirmation of cancer in a

³⁷ W.A. Lishman, *Organic Psychiatry. The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987), p.108.

³⁸ R.S. Greenberg, *Medical Epidemiology* (Appleton & Lange, 1993), p.58.

surgical specimen.³⁹ That being so, lawyers and other non-medical... qualified professionals sometimes think of laboratory test results, EEG findings, and the results of special investigations such as tissue examination, as constituting infallible scientific evidence of the existence or absence of a particular condition. This is rarely the case. Few special investigations of relevance to psychiatry are capable of proving or disproving a particular diagnosis and, when considering test results, the accuracy, validity and reliability of the particular test, and the possibility of human error and bias, must always be addressed. Although few tests "provide a precise diagnosis ... the result of a test should change the likelihood of a possible diagnosis, otherwise there would be little point in doing it."⁴⁰

The result returned by the test

The result returned by some tests is either positive or negative, present or absent, normal or abnormal. However, test results often occur along a continuum and do not have positive or negative outcomes. The outcome may be suspicious or suggestive of some abnormality but no more than that.

The sensitivity and specificity of the test

Sensitivity and specificity are descriptors of the accuracy of a test. A test with a very low percentage of false-negative results is described as having "high sensitivity." The greater the sensitivity of a test, the more likely it is that the test will detect persons with the disease of interest. Tests with great sensitivity are therefore useful to rule out a disease. A test with a very low percentage of false-positive results is said to have "high specificity." Thus, "the greater the specificity, the more likely that persons without the disease of interest will be excluded by the test ... Very specific tests are often used to confirm the presence of a disease. If the test is highly specific, a positive test result would strongly implicate the disease of interest."⁴¹

The validity and reliability of the test

The validity and reliability of a particular test must always be considered. Validity is the capacity of a specific test to measure what it purports to measure. In general, a test is neither valid nor invalid but has a variety of validities for different purposes. For example, the selection of a psychological test should be based upon evidence of its validity for the chosen purpose, e.g. measuring the severity of symptoms of depression.⁴² Reliability refers to the consistency with which subjects are discriminated from one another. It "is the extent to which scores obtained by testing a patient on one occasion will be the same if that person is re-examined by the same test on a different occasion."⁴³ If a test is highly reliable (it has a high reliability

³⁹ See A.R. Feinstein, "A bibliography of publications on observer variability" *Journal of Chronic Diseases* (1985) 38: 619-632; G.W. Bradley, *Disease, Diagnosis and Decisions*, *supra*, p.66; R.S. Greenberg, *Medical Epidemiology* (Appleton & Lange, 1993), p.59.

⁴⁰ G.W. Bradley, *Disease, Diagnosis and Decisions* (John Wiley & Sons, 1993), p.xiv.

⁴¹ R.S. Greenberg, *Medical Epidemiology* (Appleton & Lange, 1993), p.60. Care must, however, be taken when speaking of false-positives. For example, EEGs have been said to give a high occurrence of false-positive results in subjects with psychiatric disorders of non-organic aetiology, such as schizophrenia. This is not a false positive result, rather a positive finding of a point of contact which links different disorders at some level (evidence of similarity).

⁴² R.A. MacKinnon and S.C. Yudofsky, *Principles of Psychiatric Evaluation* (J.B. Lippincott Co., 1991), p.176.

⁴³ *Ibid.*, pp.175-176.

coefficient), one can be more confident that any differences in scores are due to actual changes in the responses being measured. To "secure reliable and valid data, it is necessary to control and standardize the fashion in which questions are asked, observations are made, and data are scored and interpreted."⁴⁴

The possibility of error

As Bradley notes, the "interpretation of diagnostic procedures is ... open to error. This must be readily apparent to anyone attending X-ray meetings, and as one might expect, it applies also to interpretation of ECG, EEG and isotope studies as well as endoscopy findings."⁴⁵ Histological data is a good example of this problem because most lay people probably believe that the microscopic examination of a human tissue sample provides conclusive evidence of the presence or absence of physical disease. The reality is rather different:

"Histological data is often taken to be the ultimate gold standard, but the process of making a histological diagnosis is very much one of recognising images and patterns, and may be just as prone to errors as a diagnosis made from clinical findings. When a histological opinion is subjected to the same critical appraisal which has been applied to clinical findings, similar disagreements have been shown ... different pathologists may reach different conclusions when interpreting the same microscopic specimen."⁴⁶

The possibility of bias

There tends to be higher agreement about normality than abnormality when it comes to examining test results. However, normal findings tend to be ignored when judging the effect of a test on the likelihood of disease. Although a negative test should have the effect of making the diagnosis less likely, "the clinician often ignores this evidence."⁴⁷ Human vanity may therefore make it difficult for a clinician to accept a finding which contradicts his original, notionally provisional, diagnosis.

LABORATORY INVESTIGATIONS

Most diseases result in chemical changes within the cells of the body so that there is frequently a change in the chemical composition of body fluids, such as blood and urine. These fluids can be chemically analysed to establish whether changes show a particular disease state. The table on page 1094 lists many of laboratory tests which may be undertaken. Depending on the test, the sample type may be blood, urine, or serum (the clear fluid portion of the blood). In theory, tests should only be performed if they will alter the patient's diagnosis, prognosis, treatment, or management.⁴⁸ Laboratory tests may be conducted to enable an early diagnosis to be made after the onset of signs or symptoms; to rule out certain differential diagnoses; to determine the stage of a disease; to estimate the activity of a disease; or to monitor the effect of drug and other therapies. According to Rose, the most relevant laboratory investigations are ESR (the erythrocyte sedimentation rate), haemoglobin and blood counts, liver function tests, thyroid function tests and serology for

⁴⁴ R.A. MacKinnon and S.C. Yudofsky, *Principles of Psychiatric Evaluation* (J.B. Lippincott Co., 1991), p.175.

⁴⁵ G.W. Bradley, *Disease, Diagnosis and Decisions* (John Wiley & Sons, 1993), p.65.

⁴⁶ R.S. Greenberg, *Medical Epidemiology* (Appleton & Lange, 1993), p.58.

⁴⁷ G.A. Gorry, *et al.*, "The diagnostic importance of the normal finding" *New England Journal of Medicine* (1978) 298: 486-489; G.W. Bradley, *Disease, Diagnosis and Decisions*, *supra*, p.55.

⁴⁸ J. Wallach, *Interpretation of Diagnostic Tests* (Little Brown & Co., 5th ed., 1992), p.7.

symphilis. Unfortunately, no laboratory tests in psychiatry can confirm or rule out diagnoses of function disorders such as schizophrenia and manic-depressive disorders. However, they can sometimes rule out organic conditions which may mimic these disorders and so reinforce such a diagnosis.

Format of the laboratory report

Where laboratory tests have been conducted, the laboratory test request form and the print-out of the test results will usually be found filed at the back of the patient's case notes. The request form should include details of any factors which are particularly germane to a test and the interpretation of its results. For example, the time when blood is drawn is important when the test component is subject to marked diurnal variation (cortisol, iron), varies with meals (glucose) or intravenous infusions taken (electrolytes), or depends on the source of specimen (arterial or capillary rather than venous blood). Many tests can be properly interpreted only when such information is known.⁴⁹ Laboratory test results generally list the tests conducted, the results of the samples tested, and give a reference range, so that it is easier to see whether any result lies outside the reference range and is abnormal. The format of the print-out is usually similar to that set out below. For an explanation of abbreviations used for units of measurement, see page 1143.

HEATHCLIFFE HOSPITAL		BIOCHEMISTRY	
John Smith	Ward F2	Consultant	Dr. Jones
Date and time of sample collection		10.09.95	
CLINICAL DETAILS: None			
		<i>Test result</i>	<i>Reference range</i>
Sodium	141	mmol/L	135-145
Potassium	4.6	mmol/L	3.6-5.0
Urea	2.9	mmol/L	2.5-6.5
<i>Sample type</i>	<i>Blood</i>	<i>Report date</i>	<i>10.09.95</i>

Interpreting laboratory results

According to Wallach, "in the majority of laboratory measurements, the combination of short-term physiologic variation and analytical error is sufficient to render the interpretation of single determinations difficult when concentrations are in the borderline range." That being so, values "are to be used as general guidelines rather than rigid separations of normal from abnormal or diseased from healthy ... A review of the texts, reference books, and current literature in clinical pathology often reveals surprising and considerable discrepancy between well-known sources."⁵⁰ More particularly, "considerable variation in test results is due not only to instrumentation, methodology, and other laboratory techniques but also to more subtle preanalytic factors such as position or condition of the patient (e.g., supine or upright, fasting or postprandial), time of day, age, sex, climate, effect of diet or drugs, characteristics of test population. It is therefore essential that the clinician use

⁴⁹ J. Wallach, *Interpretation of Diagnostic Tests* (Little Brown & Co., 5th ed., 1992), p.3.
⁵⁰ *Ibid.*

the reference ranges from the laboratory that is performing those particular tests and which it has determined for its own procedures, patient population, etc. Misinterpretation of laboratory data due to this error, as well as from overemphasising the significance of borderline values, has caused immeasurable emotional pain and economic waste for innumerable patients.⁵¹

LABORATORY TESTS — WALLACH'S GENERAL PRINCIPLES

- Under the best of circumstances, no test is perfect (e.g., 100% sensitivity, specificity, predictive value). In any specific case, the results may be misleading.
- Any particular laboratory result may be incorrect for a large variety of reasons regardless of the high quality of the laboratory; all such results should be rechecked. If indicated, a new specimen sample should be submitted, with careful confirmation of patient identification, prompt delivery to the laboratory, and immediate processing, in some circumstances, confirmation of test results at another laboratory may be indicated.
- The greater the degree of abnormality of the test result, the more likely that a confirmed abnormality is significant or represents a real disorder.
- Tables of (normal) reference values represent collected statistical data for 95% of the population rather than classification of patients as having disease or being healthy; values outside of these ranges do not necessarily represent disease. The probability of disease if a screening test is abnormal is generally low (0-15%). The frequency of abnormal single tests may be as high as 16.6% (sodium). Based on statistical expectations, when a panel of eight tests is performed in a health programme, 25% of the patients have one or more abnormal results (55% if the panel includes 20 tests).
- Results may still be within the reference range but be elevated above the patient's baseline, which is why serial testing is important in a number of conditions. An individual's test values, when performed in a good laboratory, tend to remain fairly constant over a period of years when performed with comparable technology; comparison of results with previous values obtained when the patient was not ill (if available) is often a better reference value than "normal" ranges.
- Multiple test abnormalities are more likely to be significant than single test abnormalities.
- Characteristic laboratory test profiles represent the full-blown picture of the well-developed or far advanced case, but all abnormal tests may be present simultaneously in only a small fraction (e.g., one-third) of patients with that condition.
- Clerical errors are far more likely than technical errors to cause incorrect results. Every specimen should always be accompanied by a test requisition form. Busy hospital laboratories receive inordinate numbers of unlabelled, unidentified specimens each day.
- Users should be aware of variations due to age, sex, race, size, and physiological status (e.g. pregnancy) that apply to the particular patient.
- The effect of drugs on laboratory test values must never be overlooked.

J. Wallach, *Interpretation of Diagnostic Tests*, 5th Ed., Little Brown & Co., Boston, 1992, pp. 7-8.

⁵¹ J. Wallach, *Interpretation of Diagnostic Tests* (Little Brown & Co., 5th ed., 1992), p.3.

LABORATORY INVESTIGATIONS

Test Abbrev Normal Range Elevated/Raised Depressed/Lowered Notes

Test	Abbrev	Normal Range	Elevated/Raised	Depressed/Lowered	Notes
Red Blood Cell count	RBC	Men: 4.2 - 5.4 million RBC per microlitre of blood; Women: 3.6 - 5.0 million.	Possible polycythaemia	Anaemia or severe bleeding.	Red blood cells are also known as erythrocytes and red corpuscles. Normal RBC counts vary depending on the type of sample, age and gender.
Haemoglobin (Total)	Hb	Men 14-18 gms of Hb per decilitre; women 12-16 gms.	May indicate dehydration.	Anaemia.	Haemoglobin is a type of protein in red blood cells, its purpose being to carry oxygen in the blood. Haemoglobin concentration varies, depending on type of sample drawn, age and gender.
Erythrocyte sedimentation rate	ESR	0-20 millimetres per hour.	Increased rate : Anaemia, inflammation, TB, rheumatoid arthritis.	Thrombocytopenaemia, low platelet count.	Platelets (thrombocytes) are the smallest formed elements in blood and they promote blood clotting after an injury. CNS = central nervous system.
Platelet count		130,000 - 370,000 platelets per cubic millilitre of whole blood.	Thrombocytosis, high platelet count.	Severe bleeding, infections, iron deficiency anaemia, inflammatory disorders.	Leukocytes help the body to fight infection. Also called a leukocyte count. WBC count may vary by as much as 2,000 on any given day, due to (inter alia) stress and strenuous exercise. Stronous exercise should therefore be avoided for 24 hours before a test. Certain medications may interfere with the results. Leukopenia and agranulocytosis are associated with certain psychotropic medications, such as phenothiazines and carbamazepine, clozapine.
White blood cell count	WBC	4,000 - 10,000 WBC per cubic millimetre of whole blood.	Leukocytosis. May be caused by infection but also associated with lithium and neuroleptic malignant syndrome.	narrow problems caused by e.g. viral infections, flu, measles, mubella, toxic reactions to poisons. Reduced resistance to infection.	

BLOOD ELEMENT TESTS: I. ELECTROLYTES

Test	Abbrev	Normal Range	Elevated/Raised	Depressed/Lowered	Notes
Calcium, serum	Ca	8.9-10.1 milligrams per decilitre / 4.5-5.5 millieq. per litre of blood	hypoparathyroidism, multiple fractures, over use of antacids. Associated with delirium, depression, psychosis.	hypoparathyroidism, total parathyroid removal. Associated with depression, irritability, delirium, chronic laxative abuse. May occur with Cushing's syndrome, acute pancreatitis.	Calcium helps to regulate the body's nerve, muscle, and enzyme activity. Parathyroid hormone plays an important role in helping the intestine to absorb calcium.
Chloride	Cl	100-108 millieq. per litre of blood serum.	Hyperchloreaemia. May cause stupor, even coma.	Hypochloreaemia. Underlying causes include prolonged vomiting and Addison's disease.	Low serum chloride levels are usually accompanied by low sodium and potassium levels.
Magnesium	Mg	1.7 - 2.1 milligrams per decilitre / 1.5 - 2.5 millieq. per litre of blood serum.	hypomagnesaemia. May be caused by kidney failure, adrenal insufficiency, Addison's disease. May lead to lethargy, hypotension, muscle weakness.	hypomagnesaemia. Most commonly caused by chronic alcoholism. Can lead to foot cramps, seizures, tremors.	Vital to nerve and muscle functioning.
Phosphate	P	2.5 - 4.5 milligrams per decilitre.	Hyperphosphataemia. Rarely a medical problem. Skeletal disease, healing fractures, thyroid problems, acromegaly.	Hypophosphataemia. Maintenance of phosphate levels have an inverse relationship: if one is elevated, the other is lowered. Phosphate levels are interpreted with calcium results. Levels may be altered by some medications. Phosphate is the dominant anion in the intracellular component.	Phosphates regulate calcium levels. Serum calcium and phosphate levels have an inverse relationship: if one is elevated, the other is lowered. Phosphate levels are interpreted with calcium results. Levels may be altered by some medications. Phosphate is the dominant anion in the intracellular component.

BLOOD ELEMENT TESTS: 3. PROTEINS

Albumin	alb.	(Albumin fraction) 3.3 Dehydration -- 4.5 grams per decilitre of serum.	Chronic syphilis, rheumatoid arthritis, diabetes mellitus
Protein (Total)		6.6 - 7.9 grams per decilitre of serum.	Malnutrition, uncontrolled diabetes mellitus, hyperthyroidism.
Gamma globulin transferrase	GGT	Men 8 - 37 int. units per litre; women 5 - 24.	Any acute liver disorder. Moderately raised levels may indicate acute pancreatitis, kidney disease. Sometimes seen with epilepsy or brain tumours. Levels increase after alcohol ingestion.
Creatine phosphokinase	CPK		Neuroleptic malignant syndrome, intramuscular injection, dystonic reactions, use of antipsychotics.
Creatine kinase	CK	Total CK levels range from 25-130 int. units per litre for men and 10-150 for women. Normal CK levels may be significantly higher in very muscular people.	Increased total CK levels indicate injury to cells. May be due to severe hypokalaemia, carbon monoxide poisoning, following seizures and, occasionally, brain damage.

The test may be conducted to evaluate liver function and alcohol ingestion.

Lithium may interfere with results. CK (CK-BB), a component of CK ("isoenzyme") is found mostly in the brain. It is not usually detectable; if detected, this may indicate brain tissue injury, widespread malignant tumours, severe shock, kidney failure. An increase in CK-MB may be due to skeletal muscle damage following an intramuscular injection.

BLOOD ELEMENT TESTS: 2. ENZYMES

Potassium	K	3.5 - 5.0 millieq. per litre of blood serum.	<i>Hyperkalaemia</i> . Can lead to weakness and nausea. May indicate Addison's disease, kidney failure.
Sodium	Na	135 - 145 millieq. per litre of blood serum.	<i>Hypotonaemia</i> . Drinking too little water, eating too much salt, diabetes insipidus, severe vomiting, diarrhoea.
Alkaline phosphatase	Alk. Phos.	Men 90 - 239 int. units per litre; women under 45 = 76 - 196; women over 45 = 87 - 250.	Many causes. <i>Hyperparathyroidism</i> , <i>Pernicious anaemia</i> , hepatic disease, phenothiazine use.
Amylase		Serum levels range from 30 - 220 int. units per litre.	Acute pancreatitis (peaks at 12-48 hours and returns to normal after 3-4 days).
Aspartate aminotransferase	AST	8-20 int. units per litre.	Hepatic disease, pancreatitis, alcoholism.
Cholinesterase		Pseudocholinesterase: 8 - 15 int. units per millil. of blood serum.	

The enzyme is involved in bone calcification.

More than 20 methods of measuring serum amylase exist and test levels cannot always be converted to a standard measurement.

AST is released into the bloodstream in proportion to the amount of cell damage due to heart or liver problems. AST level fluctuations reflect the extent of cell damage. Increasing levels may indicate increasing disease severity, decreasing disease resolution and tissue repair.

The cholinesterase test measures the amount of two similar enzymes: acetylcholinesterase and pseudo-cholinesterase. The first is present in nerve tissue and the grey matter of the brain, the second in the white matter of the brain. Cholinesterase levels may be measured to evaluate response to related substances before ECT.

BLOOD ELEMENT TESTS: 3. PROTEINS

Albumin	alb.	(Albumin fraction) 3.3 Dehydration -- 4.5 grams per decilitre of serum.	Chronic syphilis, rheumatoid arthritis, diabetes mellitus
Protein (Total)		6.6 - 7.9 grams per decilitre of serum.	Malnutrition, uncontrolled diabetes mellitus, hyperthyroidism.
Gamma globulin transferrase	GGT	Men 8 - 37 int. units per litre; women 5 - 24.	Any acute liver disorder. Moderately raised levels may indicate acute pancreatitis, kidney disease. Sometimes seen with epilepsy or brain tumours. Levels increase after alcohol ingestion.
Creatine phosphokinase	CPK		Neuroleptic malignant syndrome, intramuscular injection, dystonic reactions, use of antipsychotics.
Creatine kinase	CK	Total CK levels range from 25-130 int. units per litre for men and 10-150 for women. Normal CK levels may be significantly higher in very muscular people.	Increased total CK levels indicate injury to cells. May be due to severe hypokalaemia, carbon monoxide poisoning, following seizures and, occasionally, brain damage.

The test may be conducted to evaluate liver function and alcohol ingestion.

Lithium may interfere with results. CK (CK-BB), a component of CK ("isoenzyme") is found mostly in the brain. It is not usually detectable; if detected, this may indicate brain tissue injury, widespread malignant tumours, severe shock, kidney failure. An increase in CK-MB may be due to skeletal muscle damage following an intramuscular injection.

LUMBAR PUNCTURE AND CEREBROSPINAL FLUID (CSF)

The cerebrospinal fluid consists of water, mineral salts, glucose, proteins and other similar substances. It supports the brain, maintaining a uniform pressure round the brain and spinal cord, acting as a cushion and shock absorber. Approximately 500 ml. of cerebrospinal fluid (CSF) are produced daily.⁵² In psychiatric patients, lumbar puncture "will sometimes be indicated in patients who show disturbance of consciousness or unexplained change of behaviour, even in the absence of definite neurological signs."⁵³ Examination of the CSF in cases of encephalitis and general paresis may be crucial in alerting the clinician to the diagnosis, although a normal CSF does not mean that a pathological process in the central nervous system can be excluded. Many pathological processes responsible for enduring brain damage and neuropsychiatric disturbance "will have subsided by the time the patient is examined, and will have left a normal fluid in their wake."⁵⁴ The information to be obtained from lumbar puncture has been summarised by Walton. The pressure is raised in the presence of tumour, haematoma, abscess, or cerebral oedema, moderately raised in severe arterial hypertension, and may be raised in cases of hypoparathyroidism. An increase in the number of leukocytes (pleocytosis) *inter alia* implies meningitis or encephalitis. In untreated general paresis, 5-50 lymphocytes — a type of white blood cell — are usual. There may be an increase in the protein content in cases of encephalitis, meningitis, neurosyphilis and multiple sclerosis.⁵⁵ The form used to record the findings will usually be similar to that for laboratory tests (1092), and contain information listed under a number of sub-headings such as the appearance of the fluid (e.g. "clear and colourless"), cell counts (red and white blood cells), protein, and culture (e.g. "no growth after two days' incubation"). The risk attached to lumbar puncture is generally small.

ELECTROENCEPHALOGRAPHY (EEGs)

The electroencephalogram (EEG), developed in 1929, records the electric potential activity of the brain. It is a safe technique for investigating brain function and causes no discomfort to the patient. An EEG may be performed where epilepsy is suspected and, more particularly, if there is a suggestion of altered levels of consciousness, automatism, head injury, and hallucinations. Although safe and non-intrusive, there are "certain marked limitations" to its clinical usefulness.⁵⁶ In particular, it should immediately be noted that specific "functional" psychiatric disorders (such as schizophrenia, mania and depression) are not associated with pathognomonic EEGs.

EEG procedures

The major determinant in EEG is the electrical activity of the neurones in the uppermost neuronal layers of the cortex.⁵⁷ 16 electrodes are placed in standardised positions over the scalp and the graphic recordings from each electrode are drawn by recording pens and placed in montages on the recording paper. Various activating

- ⁵² H. Kaplan and B. Sadock, *Synopsis of Psychiatry* (Williams & Wilkins, 7th ed., 1994), p.92.
⁵³ W.A. Lishman, *Organic Psychiatry, The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987), p.114.
⁵⁴ *Ibid.*, p.115.
⁵⁵ Sir J. Walton, *Essentials of Neurology* (Pitman, 5th ed., 1982). See Lishman, *supra*, pp. 114-115.
⁵⁶ W.A. Lishman, *Organic Psychiatry, The Psychological Consequences of Cerebral Disorder, supra*, p.109.
⁵⁷ H. Kaplan and B. Sadock, *Synopsis of Psychiatry, supra*, p.119.

BLOOD ELEMENT TESTS: 4. PIGMENTS		BLOOD ELEMENT TESTS: 5. VITAMINS	
Bilirubin / Total Bill.	Indirect serum method: Hepatic disease (elevated indirect serum bilirubin levels)	Vitamin B₁₂	3-16 nanograms of folic acid per millilitre of blood.
	1.1 millig. per decilitre of blood serum, or less	Vitamin B₆	3-5 micrograms per decilitre of blood.
	(direct serum method: 0.5).		100-700 picograms of B ₁₂ per millilitre of blood.
Creatinine	Kidney disease that has seriously damaged 50% or more of the tissue; may be associated with acromegaly.		Cirrhosis; acute or chronic hepatitis.
	Men = 0.8 - 1.2 millig. per decilitre of blood; women = 0.6 - 0.9.		Inadequate dietary intake, overactive thyroid, pregnancy, CNS damage.
	also associated with acromegaly.		Essential for RBC production.
	portional to the body's muscle mass.		Essential for growth and tissue function.
	down of red blood cells.		Stress.
	found in bile and produced by the breakdown of red blood cells.		cephives, and the use of phenytoin.
			associated with alcoholism, oral contraceptives, and the use of phenytoin.
			agitation, dementia, and delirium. As production.
			with psychosis, paranoia, fatigue.
			Vitamin B ₁₂ levels. Influences RBC
			Often performed together with a test for
			Vitamin B ₁₂ deficiencies associated

procedures and specialised recording techniques are used to enhance the ability of the EEG to diagnose brain disorders⁵⁸

- 1.) **Nasopharyngeal electrodes or sphenoidal electrodes** may be used. Their greater physical proximity to the limbic areas of the brain can enable abnormal electrical activity in the anterior and medial temporal lobe to be picked up in cases where temporal lobe epilepsy is suspected.
- 2.) **Hyperventilation** for approximately three minutes can cause spikes, sharp waves, or paroxysms of slow-wave activity to emerge more clearly.
- 3.) Seizure patterns may emerge, and a generalised seizure may even be provoked, following **photic stimulation**.⁵⁹ This involves showing the patient a flashing strobe light during the EEG. An abnormal result is the appearance of paroxysmal activity not in phase with the flashing light.
- 4.) **Sedative-induced sleep** (using a barbitone) or **sleep deprivation**, involving keeping the patient awake at night before the EEG, causes the patient to be drowsy during the EEG procedure. This may elicit EEG changes during sleep, or the transition between wakefulness and sleep, which are indicative of cerebral pathology, including epileptic discharges within the temporal lobes.
- 5.) **Drug activation** may occasionally be employed because many medications enhance epileptiform activity.

Normal EEG rhythms

Brain electrical activity is evaluated according to the frequency, amplitude, and form (distribution) of brain wave tracings. Evaluation of the EEG also requires inspecting for any paroxysmal bursts, such as spike and wave bursts, which may indicate epileptic activity.

The frequency of EEG rhythms

The frequency of brain waves is measured in cycles per second (c/s), one hertz (Hz) corresponding to one cycle per second (1 c/s). In a normal adult during the awake state, frequencies range from 8 Hz to 13 Hz and such frequencies constitute an alpha rhythm. By convention, the frequency of EEG rhythms are classified according to four classes.⁶⁰

⁵⁸ See H. Kaplan and B. Sadoock, *Synopsis of Psychiatry* (Williams & Wilkins, 7th ed., 1994); W.A. Lishman, *Organic Psychiatry. The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987); B.K. Puri and P.J. Tyrer, *Sciences Basic to Psychiatry* (Churchill Livingstone, 1992).

⁵⁹ W.A. Lishman, *Organic Psychiatry. The Psychological Consequences of Cerebral Disorder*, supra, p.110.

⁶⁰ The terms lambda (λ) and mu (μ) activity will, however, also be encountered. Lambda activity occurs only over the occipital region in subjects with opened eyes. It is related to ocular movements occurring during visual attention. Mu activity occurs over the motor cortex and is related to motor activity, being abolished by movement of the contralateral limb. See B.K. Puri and P.J. Tyrer, *Sciences Basic to Psychiatry* (Churchill Livingstone, 1992), pp.63-64.

THE FREQUENCY OF EEG WAVES

Frequency	Class	Notes
< 4 c/s	Delta (δ) activity	Low-frequency, high-amplitude delta and theta activity do not normally occur in waking adult EEGs but are normal features of sleep.
4-8 c/s	Theta (θ) activity	
8-13 c/s	Alpha (α) activity	Alpha activity represents the resting normal EEG rhythm of an awake adult human with closed eyes.
> 13 c/s	Beta (β) activity	When the awake resting adult opens his or her eyes or is otherwise stimulated out of a state of quiet cerebration, the alpha activity is largely replaced by beta activity. This replacement of alpha activity is known as "alpha blocking," and as the "alerting or arousal response."

Amplitude and paroxysmal activity

The average voltage of the alpha rhythm is 30-50 μ V with spindle-shaped modulations. "Spikes" are high peaked discharges which rise and fall abruptly, standing out above the general amplitude of the other waves. These transient high peaks, although lasting less than 80 milliseconds, can clearly be differentiated from the general amplitude of the background EEG reading. "Sharp waves" rise steeply and then fall more slowly. These wave formations are conspicuous but, as they fall off more slowly, they last for more than 80 milliseconds. Slow waves may be preceded by several spikes and spikes may also alternate with delta waves.⁶¹

Interpretation of EEG rhythms and activity

Wave and spike discharges occurring at a rhythm of 3 c/s constitute the classical EEG feature of petit mal epilepsy⁶² while absence seizures (petit mal) and Creutzfeldt-Jakob disease are associated with relatively specific EEG features. However, the EEG is not a sensitive test and it has little diagnostic specificity. It is probably true to say that a normal EEG never excludes any clinical condition, but can serve to diminish the probability of its existence.⁶³ A certain proportion of healthy patients show abnormal activity and, conversely, the results can be normal in patients with obvious cerebral dysfunction. In particular, approximately 30 per cent of people with epilepsy have normal EEGs between attacks. Given these limitations, "the most useful help will be obtained ... when the person interpreting the record is fully acquainted with all relevant clinical information about the patient's illness."⁶⁴ Further information about the interpretation of EEG results is given in the following table.

⁶¹ W.A. Lishman, *Organic Psychiatry. The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987), p.109.

⁶² *Ibid.*

⁶³ *Ibid.*, p.110.

⁶⁴ *Ibid.*

INTERPRETATION OF EEG RESULTS

1. Normal EEG rhythms vary with age. In old age, normal changes include a decrease in the amplitude and average frequency of alpha activity, diffuse slowing, and the presence of brief runs of frontotemporal, mainly left-sided, low-frequency activity (Puri & Tyrer, p.64).
2. The average frequency of normal EEG rhythms varies with the level of alertness and blood sugar level. Such physiological changes in the record "are indistinguishable from those associated with many pathological states, and can readily be misinterpreted as evidence of disease" (Lishman, p.110).
3. The average frequency of alpha rhythm varies in women according to their menstrual cycle. Hyperthermia causes changes in alpha activity and hyperventilation also causes changes in the EEG. The consumption of alcohol can cause changes in the EEG of normal subjects that are usually associated with epilepsy.
4. Scalp muscle activity may be confused with fast beta activity and eye movements may be confused with slow delta activity over the frontal poles (Kaplan and Sadock, p.123). These phenomena are sometimes known as "EEG artifacts."
5. Approximately 15% of "normal" subjects have "abnormal" EEGs and the figure is somewhat higher among patients with neurotic disorders.
6. Patients with epileptic activity are often not detected on a routine EEG (Kaplan and Sadock, p.123). Consequently, a normal EEG cannot be used on its own to exclude a diagnosis, including epilepsy, without investigation
7. Mental disorders "of apparently non-organic origin are known to be associated with an increased incidence of abnormalities in the EEG" (Lishman, p.110). One-half of patients with a psychopathic disorder have abnormal EEGs, rising to 60-70% of patients and prisoners categorised as aggressive psychopaths; up to 20% of patients with manic-depressive disorders show "mildly abnormal" records; and up to 25% of patients with schizophrenia show "more definite" abnormalities, including epileptiform activity, the incidence being particularly high in cases of catatonic schizophrenia; (Lishman, pp.110-111). The percentage of diffusely abnormal EEGs in persons with schizophrenia is two to three times that found in the normal population. There may be increased presence of delta activity.
8. Psychotropic medication may affect EEG results — antidepressants lead to an increase in delta activity, anxiolytics to increased beta activity, and antipsychotics to a decrease in beta activity and an increase in low-frequency delta and/or theta activity. Chlorpromazine and other phenothiazines, antidepressants and lithium potentiate epileptic discharges.

Sources: W.A. Lishman, *Organic Psychiatry, The Psychological Consequences of Cerebral Disorder* (Blackwell Scientific Publications, 2nd ed., 1987); H. Kaplan and B. Sadock, *Synopsis of Psychiatry* (Williams & Wilkins, 7th ed., 1994); B.K. Puri and P.J. Tyrer, *Sciences Basic to Psychiatry* (Churchill Livingstone, 1992).

Format of the EEG report

Some one hundred pages of recording paper may be evaluated. However, a summary of the results of any EEG investigation will usually be found filed at the back of the patient's case notes and these reports are generally in a form similar to that presented immediately below. Abnormal rhythms may be describe as synchronous or asynchronous depending on the coincidence of their appearance in the different electrode leads. The rhythms may be generalised, confined to one side of the brain (unilateral) or focal.

HEATHCLIFFE HOSPITAL	DEPARTMENT OF CLINICAL
	NEUROPHYSIOLOGY
John Smith	Ward F2
	Consultant
	Dr. Jones
	Date of EEG
	10.09.95

The record is of low amplitude and contains generalised fast activity which is most marked centrally. Generalised, rhythmical theta at 4-5 Hz is also seen, which is at times most marked over the left temporal region. Occasional 3-4 Hz activity is also apparent and minimal amounts of 7 Hz rhythmical components are seen posteriorly. Eye opening and closure has little effect on the record.

Hyperventilation and photic stimulation were not obtained.

Comment/summary

There is a mild asymmetry of the background rhythm. No repetitive complexes are seen. No epileptiform activity is present. The findings are not that of an encephalitis.

Signed A. Peters (Consultant Clinical Neurophysiologist)

BRAIN SCANS

There are several different brain imaging techniques, including computed tomography (CT scans), magnetic resonance imaging (MRI scans) and Positron emission tomography (PET scans). Tomography is a method of radiography which can display details in a selected plane within the body.

CT scans

Computed tomography (CT scans, formerly known as CAT scans) enables an X-ray picture of the brain to be obtained. Minute variations in the density of bone, cerebrospinal fluid, blood vessels, and grey and white matter can be assessed by utilising an x-ray source, computer processing, and photographic material. Many brain lesions larger than 1.5cm in cross section can be visualised as, for example, can ventricular size. Although brain changes in patients with schizophrenia have been reported, CT changes in patients with major psychiatric disorders at present have greater research than diagnostic value.⁶⁵ However, they may be used to rule out organic brain disorders, such as pituitary tumours, and cerebrovascular diseases.

⁶⁵ R.A. MacKinnon and S.C. Yudofsky, *Principles of Psychiatric Evaluation* (J.B. Lippincott Co., 1991), p.126. Nasrallah, et al., *Journal of Neuropsychiatry and Clinical Neurosciences* (1989) 1, 1.

Magnetic Resonance Imaging (MRI)

Magnetic resonance imaging (MRI), which involves placing the patient in a long tubular structure containing powerful magnets, produces images of the brain that closely resemble CT scans but are of a superior resolution. The technique reveals highly detailed images of the fine structures of the brain which can resemble anatomical preparations. More particularly, MRI scanning is capable of taking thinner slices through the brain and can distinguish between white and grey matter.⁶⁶ Consequently, the presence of lesions can be detected more precisely than with any other brain imaging technique. However, its precision also makes it a highly expensive technique.

Positron Emission Tomography (PET)

Positron emission tomography is an expensive brain imaging technique which involves the introduction of manufactured radioactive compounds. It can produce detailed and specifically coloured images of brain function rather than merely an image of the brain's structure. Again, the procedure's use in cases of major psychiatric disorder currently has greater research than diagnostic value and it is only available at special centres.

PSYCHIATRIC RATING INSTRUMENTS

Psychiatric rating scales, also referred to as rating instruments, attempt to measure (quantify) various aspects of a patient's mental functioning by means of rating the presence, absence or severity of certain symptoms or behaviour. Depending on their design, the scales may be used to measure inner mental phenomena, such as mood or behaviour, or the external manifestations of an individual's mental state. Some instruments are highly specific, concentrating on a single aspect of a person's mental state or behaviour, such as aggression. There are two main types of rating scales. **Likert scales** consist of a number of categories (symptoms), each of which is rated on a scale in terms of its severity (0 = symptom absent, 1 = doubtful, 2 = mild, 3 = moderate, 4 = severe, or as to duration, 0 = never present, 1 = some of the time, 2 = often, 3 = always). **Analogue or graphic scales** consist of a straight line combined with verbal cues, e.g. "Not at all sad _____ Extremely sad." The rater places a mark on the line to indicate where the symptom lies on the dimension of severity.⁶⁷ Thompson has comprehensively reviewed the problems associated with constructing psychiatric rating scales. He concludes that such ratings "can only be expected to have limited transferability between one situation and another, for example between different groups of patients, between different raters, between different cultures and in the same groups at different times."⁶⁸ The most reliable rating scales require a limited amount of judgement or inference on the part of the rater.⁶⁹ An excellent overview of the subject may be found in MacKinnon and Yudofsky's *Principles of Psychiatric Evaluation*.⁷⁰

⁶⁶ H. Kaplan and B. Sadock, *Synopsis of Psychiatry* (Williams & Wilkins, 7th ed., 1994), p.113.

⁶⁷ C. Thompson *The Instruments of Psychiatric Research* (John Wiley & Sons, 1989), pp.4-5.

⁶⁸ *Ibid.*, p.3.

⁶⁹ H. Kaplan and B. Sadock, *Synopsis of Psychiatry*, *supra*, p.330.

⁷⁰ R.A. MacKinnon and S.C. Yudofsky, *Principles of Psychiatric Evaluation*, *supra*.

PSYCHOLOGICAL TESTS AND PSYCHIATRIC RATING SCALES

Intelligence

Wechsler Adult Intelligence Scale (WAIS-R)

An extensively standardised instrument for measuring intelligence. Provides three separate IQ scores: a full scale IQ, a verbal IQ, and a performance IQ. The verbal scales measure the ability of the patient to reason abstractly, his verbal memory capacity, verbal facility, understanding of society's conventions, and a quantitative and qualitative assessment of the patient's educational background. The performance section measures a patient's overall non-verbal, visuo-spatial capabilities, including the ability to integrate perceptual stimuli with motor responses.

Personality and behaviour

Minnesota Multiphasic Personality Inventory (MMPI)

Consists of over 500 statements to which the subject must respond "true," "false," or "cannot say." Scores the patient on ten standard clinical scales (e.g. depression, psychopathic deviance). Extensively used. An alternative scale is the Eysenck Personality Questionnaire (EPQ).

Schizophrenia and psychosis

Schedule for Affective Disorders and Schizophrenia (SADs)

Focuses on the one-week period during the current episode when the particular feature was most severe.

Other scales

Scale for the Assessment of Negative Symptoms (SANS); Thought Disorder Index (TDI); Quality of Life Scale (QLS); Chesnut Lodge Prognostic Scale for Chronic Schizophrenia.

Mood disorders

Beck Depression Inventory

Measures depression on Likert-type scale.

Other scales

Hamilton Depression Rating Scale; Standard Assessment of Depressive Disorders (SADD); Zung Self-Rating Scale for Depression; Montgomery-Asberg Scale; Mania Rating Scale.