

Walking Between the Worlds:
Links between Psi, Psychedelics, Shamanism and Psychosis¹
An Overview of the Literature

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Abstract

In folk lore there is a belief that many people who have an acute psychotic breakdown exhibit signs of psychic ability. Research into this folk lore is virtually non-existent, but some interesting work by Neppe (1980) and Persinger (Persinger & Makarec, 1987) psi suggests that there might be some foundation for it. My research into the pineal gland is now exploring this same area from a neurochemical perspective.

The pineal gland makes a neurohormone called melatonin which is one of the key regulators of the circadian and seasonal biological rhythms. It also makes a mono-amine oxidase (MAO) inhibitor called pinoline (Methoxytetrahydrobetacarboline (MeOTHBC)) which acts on the GABA receptors and whose chemical structure is virtually identical with the harmala alkaloids, which are key ingredients in the ayahuasca drink used by Amazonian people specifically for inducing a state of consciousness in which they state that they go out-of-body, experience travelling clairvoyance, divination and shamanic healing. The suggested neurochemistry for these effects implicates serotonin. Serotonin (5 Hydroxytryptamine (5HT)) has frequently been implicated in certain aspects of psychoses. Pinoline is a neuromodulator which prevents, amongst other effects, the breakdown of serotonin. This results in an accumulation of physiologically active amines including dimethyltryptamine (DMT) within the neuronal synapses which may lead to hallucinations, depression or mania depending on the amines being affected (Strassman, 1990). DMT is the other main ingredient in ayahuasca. There are also interesting links with the serotonergic activation by psychedelics such as LSD, psilocybin and MDMA which have all been implicated in triggering psychotic episodes, and more specifically with inducing a state of consciousness which has many similarities with both an acute psychotic breakdown and with shamanism, which traditionally uses psychedelic plants in order to achieve the desired state of consciousness.

A key link between all of these various experiences is the dream state of consciousness. Psychologically, both the shamanic initiation experience and that of an acute psychotic breakdown share many similarities with the dream state. It appears that the normal every night experience of all human beings is connected with the more extreme experiences of psychosis and shamanism through the same neurochemical pathways that underlie all these experiences. And, as the research at Maimonides (Ullman et al, 1975) and since has shown, the dream state is a psychic state of consciousness par excellence. This suggests that the anthropological reports of psychic abilities being exhibited by shamans may have some foundation, and suggests that some people who have experienced a psychotic breakdown

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could be seen in other cultures as people with a particular and highly valued gift - the gift of walking between the worlds.

1. Background: Previous Research looking at Brain - Psi Links

1.1. Epilepsy, Psi and Dreams

Until now the main theorising concerning psi and distressing mental states has been centred around the folk lore concerning epilepsy being the "holy disease." Epileptics report experiences which are very similar to psychic experiences. 70% of people suffering temporal lobe epilepsy report psi experiences. Roll (1977) noticed that many people who have experienced poltergeist phenomena have suffered epilepsy. His theory was later linked with the temporal lobes (Roll & Montagno, 1985).

A large part of this research has been by Neppe (1980). He has noted that many parapsychologists have found that:

a) ASCs are psi-conductive, eg. Ganzfeld, dreaming, meditation;

b) Psi experiences appear almost as if there are deficits in brain functioning². Various focal brain dysfunctions, such as frontal, parietal, or temporal dysfunctions may be accentuated under certain circumstances, such as epilepsy, and produce what appears to be a psi event. An alternative understanding of this is that psi experiences are subliminal events and are processed in a manner equivalent to subliminal perceptions. Here, we understand the psi information to have a very weak trace and it is this which results in the distortions which make them appear as if there are deficits in brain functioning.³

1.2. The Temporal Lobes and Psi⁴

The temporal lobes are the integrators of the brain. Temporal lobe dysfunction is commonly reflected by the most complicated kind of epilepsy, complex partial seizures, which may resemble certain psychic experiences.

Nelson (1970) did a study of trance mediums and found that 10 out of 12 mediums show temporal lobe abnormalities. By comparison 25% of the general population have temporal lobe abnormalities, so whilst it is common to have abnormalities the mediums have an outstanding proportion. This study has not been replicated.

Neppe (1983c) did a study with 6 psi experiencers and 6 non-experiencers. The experiencers had 2 to 11 different temporal lobe symptoms (see Appendix 1) per psi experience, e.g. a chilly

² e.g. Bergson's (1914) cortical filters are impaired: this theory says that the brain has filters which prevent 99.9% of experience actually reaching consciousness. Under certain circumstances these filters may leak subliminal information through to consciousness

³ Reami et al (1991) report on two patients whose awake epileptic seizures and recurrent dreams during light sleep had similar content. In both cases the electroencephalograph (EEG) showed right anterior temporal spike discharge, suggesting a role for the temporal lobe in the association between dreams and seizures. Hobson (1985) compared hallucinatory and cognitive phenomena in dreams with epileptic seizures. Recurrent dreams in epileptic patients involve distortion of image and body position, and themes such as death, falls and drowning. The dream imagery is often similar to that experienced during the seizure, as is the emotional content, primarily fear. The origin of epilepsy discharges in the right temporal lobe is consistent with such experiences. Complex partial seizures with temporal focus can be activated by the rapid eye movement (REM) phase of sleep. One may postulate that the emotion produced by the dream (anxiety and fear) would facilitate the occurrence of seizures.

⁴ The temporal lobes constitute 40% of the higher functioning area of the cerebrum. Smell, balance, hearing and taste are processed by temporo-limbic structures; and vision, light, touch, position sense and pain by neighbouring areas. They are responsible for integrating various aspects of affective, conative, and cognitive functions such as memory, learning, language, interpretation, and sense of self; as well as endocrinal, metabolic, sexual and aggressive functions. Thus complex symptomatology results from firing within a temporal lobe.

feeling with the sense of an apparition. Also they had temporal lobe symptoms when not having a psi experience. This suggests that an anomalous temporal lobe state may predispose to psi experience and a heightening of temporal lobe experiences.

Déjà vu is symptomatic of temporal lobe epilepsy and also common amongst psi experiencers. The quality of déjà vu amongst psi experiencers is qualitatively different from the epileptics. Psi déjà vu is normally linked to a major distortion in the sense of time and is linked to precognitive or retrocognitive awareness, and is clearly defined and often externally validated in some way. Schizophrenics also have a déjà vu experience which differs again in containing psychotic elements.

Persinger (1985) analysed subjective responses to religious experiences and found that those with intense experiences score high on mid-level temporal lobe signs. He also found temporal lobe EEG effects in a Transcendental Meditator during a peak mystical experience, and temporal lobe spikes during protracted intermittent episodes of glossolalia. Fenwick (1983) also suggests right temporal lobe involvement in mystical experiences. The stimulation of medial temporal areas during surgery is sometimes associated with a sense of presence, out-of-body-experiences (OBEs) and other strange experiences. Penfield (1958) recorded the experience of an OBE by stimulating the temporal lobe of an epilepsy patient.

Persinger & Makarec (1987) analysed temporal lobe sensitivity of the average person. They report some correlations of major complex partial seizure sign scores, and reports of anomalous experiences and a sense of presence in 414 students over a period of 3 years. Persinger (1988a) reports a prominence of temporal lobe symptomatology as well as psi experiences among writers, poets, musicians, actors, and artists with an increased incidence in left-handed individuals and creative academics. He also reports someone who experienced an OBE associated with hypomania and a right temporal lobe focus on their EEG.

Persinger (1988b) reports the coincidence of diurnal occurrence of complex partial seizures and psi experiences - between 2 - 4am with a further peak at 10 pm - which is the same for psi experiences with a peak at 4am and another at 4 pm.

Temporal lobe theta waves are an extremely common concomitant of a variety of different states including meditation, fatigue, drug effects, and altered states of consciousness (ASCs) (Healy, 1986).

Thus we are looking at specific personality type experiences here which correlate strongly with those found amongst psi experiencers. In other words a certain type of person has psi experiences, mystical experiences, magical ideation and this links with temporal lobe symptomatology.

2. Changing our Attitude about Psychosis

Warner (1985) in his study of schizophrenia has shown that psychosis is a disease of societies with a wage economy: tribal societies and those with subsistence economies do not show the same pattern of illness. When someone, usually a young person, has what we would call a psychotic breakdown there is no stigma and no loss of status. Either they stay within the family and extended community and do simple tasks until there is full recovery, normally within about 9 months, or else they gain status by becoming the shaman's apprentice and undergoing training. This training, which can last for up to 20 years, teaches them stability, control of their mental and emotional states and also how to go into trance states without a full blown psychotic episode, which is characterised by the hallucinations taking control as well as other social dysfunctions. The shaman is well cared for by the community, making sure that they have their needs met in recognition of the service they provide.

Boyle (1990), in her history of Kraepelin and Bleuler who introduced the concept of schizophrenia, casts doubt on the validity of the concept itself. Schizophrenic people show very little similarity in onset, course and outcome. It can develop at any time from age 15 - 55, can be short term with no recurrence or last a lifetime with no remission. It actually appears

now that they were describing cases of encephalitic lethargic which normally develops in Parkinson disease, so cases such as they describe would today have a different diagnosis.

Richard Bentall (1990) found that psychotic symptoms tend to be randomly associated with no correlation. Using cluster and factor analysis, schizophrenia is found spread evenly across all clusters and factors. There is no clear border line between schizophrenic and affective psychoses and between psychotic and neurotic. Many psychotic symptoms are related to normal mental states and the symptoms are poor predictors of final outcome. "Schizophrenia is a disorder with no particular symptoms, course or outcome which responds to no particular treatment." (Bentall, 1990)

Specifically Warner (1985) states that: Material conditions (political economy) mould the course and outcome of schizophrenia and influence its prevalence. Schizophrenia is a possibly genetically inherited illness which is strongly affected by the environment. In most cases stress triggers the psychosis.

Warner (1985) has shown that low-stress household with relatives who are less critical, controlling and intrusive is essential for recovery; the benefits are equal to, or better than, drugs. Poor working class city people with high stress environments suffer most from schizophrenia, and in these cases the state of the economy is linked to the outcome: during periods of unemployment there is less recovery and, in general, mental problems for working class people increase in a slump. Job stress, factory work and unemployment are all related to ill health and suicide. Economic uncertainty is a severe stress for most people.

There is a great similarity between many features of psychosis and the psychological effects of chronic unemployment: anxiety, depression, apathy, irritability, negativity, emotional over-dependance, social withdrawal, isolation, loneliness, and a loss of self-respect. Women are less affected by labour dynamics and suffer less from psychosis. Mazure et al (1997) examined the association of recent life stress severity to biological markers of stress in 34 newly admitted patients with acute psychosis. They found that serum cortisol was correlated with stress severity.

The recovery rates from schizophrenia are not significantly better now than at the beginning of the century: complete recovery is still only 20 - 25%; with social recovery 40 - 45%. Antipsychotic drugs are not any particular help in hospitals using social therapeutic techniques with patients and therapists living and working together. Drugs only help psychotics living in an inadequate environment: most psychotics discharged from hospital end up in inner city ghettos, unemployed and uncared for, and many end up in jail. Sadly, these people are known as "revolving-door patients."

The non-industrial extended family is a relatively low stress environment compared with the Western nuclear family unit. In countries, such as India, where there is a mixture of industrialisation and subsistence agriculture, higher caste educated people are most prone to suffer from schizophrenia. They suffer more because they are in wage labour with its stresses and unemployment. If they are sufficiently emotionally supported by relatives, friends and community then the stressful events have less impact. In general, people recover much quicker in non-industrial countries because subsistence agriculture needs constant low stress, low demanding work from everyone in a cooperative framework. Urban psychotics benefit from a return to traditional village (tribal) life.

Also tribal people have a world-view in which the supernatural plays a large part. Giving psychotic symptoms a supernatural element removes "blame" from the person, leading to conflict resolution and social reintegration with the family. If the person is being interfered with by bad spirits then they remain integrated within their family and anxiety is less because there is a higher degree of tolerance of their problems and no social stigma. The label mad is applied only to highly disruptive people, or those who are violent.

Further, certain features of psychosis can lead to considerable elevation in social status. The hallucinations and ASCs produced by psychosis, fasting, sleep deprivation, social isolation and hallucinogenic drugs are often a prerequisite for gaining shamanic power. The psychotic features are interpreted as an initiatory experience and social reintegration is so successful

that spouses are happier with them than before breakdown. Indigenous healers who have suffered psychotic episodes find their elevated status and well-defined curing role a valuable defence against relapse. The psychotic may be able to function well as a shaman because the emotional supports available to the shaman greatly alleviate the strain of an otherwise excruciatingly painful existence. These are of necessity people who have few personality or emotional disorders, since the presence of these would compound the experiences and make the person unfit for the role of shaman.

As non-industrial countries get "developed" so the level of schizophrenia rises in the rural areas around the industrialised city/area. Where there are migrant-labour practices, and where people, e.g. Aborigines, American Indians, the Scots and the Irish have lost their land and associated life styles, this results in gross unemployment and loss of self esteem and the highest levels of schizophrenia. Assured employment in the former Socialist countries and the stable role expectations among Hutterites and the Amish of USA, and Southern Italians who have subsistence farming are all linked with less schizophrenia. Immigrants who enter the lower classes in their new country experience a high prevalence of schizophrenia; those who enter at a higher level of status do not. For example, Harrison et al (1997) have replicated the finding of increased incidence of schizophrenia and related psychoses in first and second generation migrants to Britain from the Caribbean. Schizophrenics founder under the same difficulties with which all of us struggle all our lives.

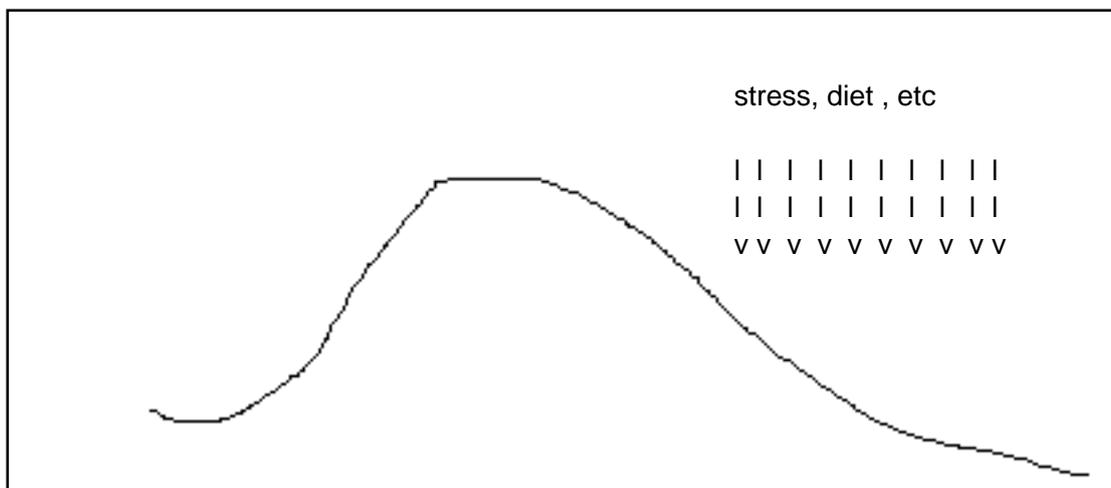
Thus the Industrial Revolution is linked to an increase in occurrence of schizophrenia. Barham & Hayward (1990) point out that the negative symptoms of chronic schizophrenia, e.g. loss of affect, are related to all inmates of institutions such as prisons, refugee camps.

3. Neurochemical Correlates of Psychosis

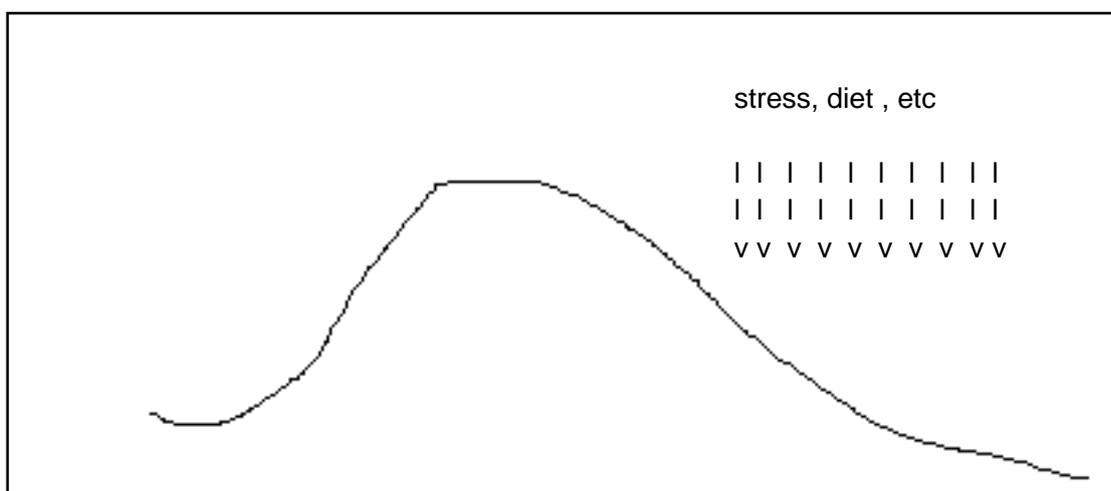
3.1. Schizotypy

The brain is an holistic system with only part localization of function. There are many-to-many correspondences between mental states and brain events - the aetiology of even a single symptom (e.g, hallucination) is likely to be variable (Jackson,1990).

There is a continuity between health and sickness - one can be more or less sick. Mental illnesses form the endpoints of continuously variable behavioural dimensions and these dimensions have a substantial biological basis grounded in naturally occurring individual variation in brain functioning. "It is possible that structural or biochemical abnormalities may induce a vulnerability to certain schizophrenic experiences which act as a catalyst for later elaboration by otherwise normal cognitive processes. These abnormalities may reflect biases in the way that schizophrenics process information or in such fundamental processes such as arousal" Jackson. (1990) Temperamental or personality differences partly reflect differences in the underlying properties of the nervous system. There is a distinction between enduring traits as descriptors of personality and symptoms as indicators of illness, but a connection can be discerned. Thus one can compare schizophrenia to systemic disease, e.g. hypertension related diseases.



blood pressure -----> increasing risk of stroke etc caused by stress, diet, or



schizotypal nervous system - -----> increasing risk of schizophrenia

Therefore, a normal body mechanism can bring about a state of dysfunction. The continuity is that of normal individual variation with predisposition to disease greater in some than in others. Systemic diseases are normally multiply determined. There is a normal "nervous type" associated with schizophrenia comparable to those other traits underlying other psychological disorders, and the "dispositional" aspects are inherited. This graded continuum of liability to schizophrenia could be called "schizotoxia."

Schizotypy scales identify 3 behavioural components:

- 1) cognitive: active florid symptoms, e.g delusions and paranoia;
- 2) affective: passive, introverted symptoms, e.g. anhedonia;
- 3) antisocial nonconformity.

These scales are linked with cognitive, psychophysiological (galvanic skin response, GSR) and neuropsychological (hemisphere) research. There are many nervous properties which relate to temperamental or personality variations that are under some genetic control, e.g. extraversion, anxiety proneness.

For example, one theory suggests a weakening of the inhibitor system (Bergson's filter theory (see note 2)). Thus possibly, schizophrenia is a failure to limit the contents of consciousness. This openness to stimulation, open mode of attention to the environment, also links to high creativity, and to the shamanic traditions. Ambiguous, critical, emotion-laden communications from another might have a greater than normal impact because the person is unduly sensitive to, and therefore more likely to distort, the meaning. This happens quite often during adolescence as part of the emotional growth pattern.

3.2.Neurochemistry of Shamanic States, Psychosis and the Pineal Gland.

The shamanic state of consciousness is often precipitated by psychotropic plants such as ayahuasca, peyote, and amanita muscaria. These drugs activate the serotonergic (5HT) receptors in a similar fashion to the pineal betacarbolines. I have discussed elsewhere that the pineal betacarbolines are linked with psychic states of consciousness and with the shamanic out-of-body state through the similarity of the harmala alkaloids and pinoline (Roney-Dougal, 1986,1988,1990,1991,1993, 1999). Now I am presenting a link between the pineal gland and the psychotic state of consciousness. I consider that our society does not recognise the potential of people who experience this state of consciousness, and so we are creating a severe disabling illness totally unnecessarily by not treating these people appropriately in the manner that tribal and subsistence economy people do. It is time we recognised the potential shaman in the psychotic.

3.2.1. Geomagnetic Fields, Depression and the Role of Melatonin

One of the key factors in linking the pineal with psychosis is the work of Kay (1994). Admission to mental hospital varies with season and time of the month, and mental illness is more common the further north you go, i.e., into long light summers, and long dark winters. Seasonal variation in the incidence of depressive illness has been recognised since Hippocrates (Lewis, 1934). Onset of depressive illness, admission to hospital, prescriptions of antidepressant medication and incidence of suicide have all been found to show a bimodal annual distribution with peaks in spring and autumn.

Kay (1994) has found, in a 10 year study of admission rates to Lothian psychiatric hospitals, that two weeks after a geomagnetic storm there was a significant rise (36.2%) for male admissions for depression phase of manic-depression and a smaller non-significant rise for women with psychotic and non-psychotic depression.⁵ There was no correlation between intensity of storm and admission rates, i.e. if any sort of storm happens, mild or severe, you get increased admission rate, which is consistent with a threshold event affecting predisposed individuals. The effect of geomagnetic storms could range from mild irritability to full-blown depression. Monthly total psychiatric admissions have been positively correlated with solar radioflux levels and indices of geomagnetic ionospheric disturbance.

Kay suggests that geomagnetic storms partly account for the bimodal annual distribution of depression by acting either through desynchronisation of pineal circadian rhythms, or via an effect on 5HT-ergic and adrenergic systems leading to depressed mood and secondary disruption of pineal melatonin synthesis. Alteration in geomagnetic field (GMF) activity is associated with decreased serotonin NAT activity and decreased melatonin synthesis. Geomagnetic storms in spring enhance the suppressing effect of increasing daylight on melatonin synthesis, leading to a phase advance in the circadian rhythm, while the effect of storms in autumn tend to be partially compensated by the pineal response to decreasing light intensity. This is consistent with a Southern Hemisphere peak for psychotic depression admissions in September and October, and a peak in Sweden in April.

The main innervation of the pineal is via adrenergic systems so magnetic fields may affect pineal functioning via this mechanism. Sandyk (1990a) associates depression with decreased melatonin secretion and suggests that melatonin regulates dopaminergic, cholinergic and GABA-ergic functions. .

⁵ Why the gender difference? It could be that female sexual hormones provide some defence against depression, or slow down the effects, or there are cultural effects. Possibly women are less affected by geomagnetic storms because their melatonin rhythms and levels are linked with the menstrual cycle, and the pineal has a complex interaction with the sexual hormones. Perhaps we have links here with post-natal depression and menstrual cycle depression. c.f. Women in industrial societies show a peak incidence of schizophrenia a decade later in life than do men, and women in Third World show lower prevalence than men, partly because they are less affected by the loss of land and subsistence life style.

It is also possible that the association between geomagnetic storms and depression could be due to an indirect association with changes in meteorological factors. Atmospheric ionisation and barometric pressure have been shown to affect measures of 5HT activity. Prolonged exposure to abnormal magnetic fields may also have an effect, acting through a similar mechanism to geomagnetic storms. Depression admissions have been associated with exposure to 50Hz e-m fields in the home.

3.2.2. Role of Circadian Rhythms, Melatonin and Manic-Depression

We have two circadian clocks - one is a biological clock which includes the ventromedial nucleus of the hypothalamus, the locus ceruleus and the dorsal raphe nucleus - food is the zeitgeber for this clock; the second clock includes the retina, hypothalamic suprachiasmatic nucleus (SCN) and pineal gland - light is the zeitgeber for this clock. The two clocks are normally in synchrony but in view of the independence of the two clocks asynchrony is possible, and the affective disorders may be caused by such a dysfunction (Maurizi, 1984). Disturbances of the noradrenergic activity of the central nervous system (CNS) have been related to affective disorders, which are also accompanied by depressed melatonin secretion and sleep disturbances. Manic-depression is associated with a sleep disorder: in the manic phase the person suffers from insomnia, in the depression state they sleep too much. Melatonin is mainly secreted at night through noradrenergic stimulation of beta-receptors on the pinealocytes. Melatonin secretion can therefore be inhibited by beta-blocking drugs. Melatonin secretion is depressed in mental disorders with sleep disturbances such as the manic phase of certain affective disorders, alcoholic abuse and dts with hallucinations.

There are mixed results regarding melatonin secretion in affective disorders - some find decreased nocturnal melatonin secretion in unipolar depressed adults, others do not. Lewy et al (1979) reports increased melatonin levels in bipolar subjects through a 24 hour cycle. Lam et al (1990) report decreased nocturnal melatonin production in bipolar patients compared with unipolar depressed and control subjects. Reiter (1982) suggests that manic-depressives have a low melatonin concentration during suicidal episodes and a high melatonin concentration during manic episodes.

Affective disorders involving circadian dysregulation may respond to interventions that restore a normal sleep-wake cycle. Robertson & Tanguay (1997) describe a boy with bipolar disorder. A trial of melatonin led to rapid relief of insomnia and aborted manic episodes for at least a two year period. Insomnia can be both a symptom and a precursor of mania (Wehr et al, 1987; Leibenluft et al, 1995). On the other hand, sleep deprivation therapy for depression is thought to exert its effect by resynchronising circadian rhythms, while antidepressants and lithium lengthen the pineal circadian cycle period re-synchronising a phase advanced cycle.

In addition, melatonin administration to clinically depressed patients gives negative effects (Carman et al, 1976). The treatment of psychotic depression with daytime melatonin increases psychotic symptoms and abolishes diurnal mood variation. The timing of this treatment would tend to exacerbate a desynchronised rhythm. De-synchronising circadian rhythms is therefore a possible mechanism for mood switching in manic-depressive illness, and manic-depressive patients have been found to be supersensitive to the suppressing effect of light on night-time melatonin synthesis, suggesting that in these people the pineal gland may be generally supersensitive to environmental factors including geomagnetic storms.

Brismar (1987) studied people on beta blockers because of angina, hypertension, etc. and found that those with depressed nightly urinary melatonin excretion suffered from CNS symptoms such as nightmares and hallucinations. Not many people suffer these effects.

Another possible site of action for melatonin is the dorsal raphe nucleus. (LSD also acts on the dorsal raphe nucleus.) Melatonin could enhance 5HT levels by acting as a MAO inhibitor in the synapses of the dorsal raphe nucleus.

Abnormalities in circadian rhythm organization are consistent features in manic-depressive illness (Wehr & Goodwin, 1980). Wetterberg et al (1981) suggest pineal involvement. Manic-depressives have an earlier onset of melatonin secretion during depression, with this secretory onset being even earlier in mania (Lewy & Kern, 1984). Manic depressives are also super-sensitive to light with 50% reduction in melatonin production on exposure to 500 lux. Normally one needs 2500 lux for this suppression whereas manic-depressives have complete melatonin suppression at 1500 lux (Lewy & Kern, 1984). It is possible that supersensitivity to light with alteration in retinal perception of light could contribute to a phase advance of those rhythms that are entrained to the light-dark cycle and thus lead to alterations in those function that are influenced secondarily by such rhythms (for review see Kripke & Risch 1986; Rosenthal, 1986; Thompson, 1987).

Thus melatonin, as an integral aspect of our circadian rhythm is implicated in manic-depression.

3.2.3. Seasonal Affective Disorder (SAD)

SAD is the name given to the hypothesis that decreasing daylight desynchronises the pineal rhythm of melatonin synthesis. Non-psychotic depression does show some bimodal seasonal variation. In line with the idea that psychosis is the extreme end of a normal mechanism, manic depression is thus an extreme response to a bimodal variation with season that is very common amongst people living in latitudes with variable daylength.

Arendt (1985) has shown that those who suffer from depression can be helped by sun lamp treatment. To ameliorate SAD symptoms intensity of light must be sufficient to suppress melatonin synthesis and secretion. Some SAD patients respond to levels as low as 200 lux. Alternatively one can use melatonin treatment in pill form.

More generally the pineal plays an anti-stress function and "forms part of a broader neurohormonal feedback mechanism linking the stress response of the hypothalamus - hypophysis neuroendocrine complex." (Reiter, 1982).

Thus, as with schizotypy and schizophrenia there is a normal aspect of a behavioural pattern that we call a disorder, manic depression. We can see that both these forms of psychosis are at the extreme end of a continuum but do not differ in form from experiences common to many people. We are all of us more active in the long, light summer days, and more inclined to hibernate during the dark, cold winter.

3.2.4. Melatonin and Dreams

Melatonin per se may well, directly or indirectly, be of importance for normal sleep rhythm and for ordinary dream activity during sleep. REM sleep has been suggested to be induced by the actions of CSF (cerebrospinal fluid), melatonin and vasotocin on the dorsal raphe nucleus and the locus ceruleus. Melatonin and vasotocin have been noted to be in rhythm with REM sleep (Pavel et al, 1979; Birkeland, 1982). Maurizi (1984) speculates that the synaptic enhancement of monoamines induced by melatonin causes feedback inhibition of the locus and raphe nuclei in REM sleep. A cycle of neuropeptides and neuromodulators in the CSF has been suggested to pace the 90 minute dream rhythm (Maurizi, 1984). Intranasal application of vasotocin⁶ and also of melatonin induces REM sleep in humans.

Maurizi (1987) suggests that REM sleep, which is under brain stem control, facilitates the transfer of intermediate-term memory into long-term storage in the neocortex. Psychotics

⁶ Vasotocin is present in the pineal gland and in the subcommisural organ. Vasotocin, vasopressin and oxytocin are all neuropeptides that vary by single amino acid substitutions. The circulation of CSF neuropeptides has been suggested to be important in many biologic behaviours including memory. Vasopressin and oxytocin seem to have opposite effects on behaviour and memory. Vasotocin emulates the amnesic effect of oxytocin when injected into the cerebral ventricles. The dorsal raphe nucleus is a site of action of both vasotocin and vasopressin. Melatonin is a releasing agent for vasotocin (Pavel et al, 1981).

suffer memory loss, so do mediums in trance, hypnotised people and those on psychedelics, and it is notoriously difficult to remember dreams. Findings suggest that REM sleep over a prolonged time period is a requisite neurobiological mechanism for the processing, maintenance, and storage of long-term memory. In humans, recall of complex associative information is significantly better after REM sleep than after non-REM sleep or wakefulness. In elderly humans a positive correlation of REM sleep with mental functioning has been demonstrated, and people with learning difficulties have decreased REM sleep. REM sleep benefits the consolidation of emotive memory, high association value memory, or memory that calls for more divergent processing. Emotional memories and emotional events seem to be resolved by REM sleep.

Patients suffering from narcolepsy, which is thought to be a disorder of the mechanism that controls REM sleep, frequently have hypnagogic and hypnopompic hallucinations. These are more than likely the emergence of REM dreams into the waking state. Drugs, such as chlorimipramine, are particularly effective in blocking hypnagogic hallucinations.

The delusions of mania are suggestive of dreams. If manic behaviour is the consequence of REM sleep chemistry intruding into the wake period, then perhaps grandiosity and a "flight of ideas" during normal REM sleep are mechanisms for imagination and creativity.

3.3. Serotonin (5HT) and Schizophrenia

Whilst melatonin is made only at night, 5HT is made during daytime. 5HT is a wake state enhancer and REM sleep inhibitor. Thus, in the northern hemisphere, we have increased levels of serotonin in the summer and decreased levels in winter. Animal data indicate that 5HT is a major neurotransmitter involved in the control of mood, aggression, pain, anxiety, sleep, memory, eating behaviour, addictive behaviour, temperature control, endocrine regulation, and motor behaviour. There is also evidence that abnormalities of 5HT functions are related to Parkinson's disease, tardive dyskinesia, akathisia, dystonia, Huntington's disease, familial tremor, restless legs syndrome, myoclonus, Gilles de la Tourette's syndrome, multiple sclerosis, sleep disorders and dementia, schizophrenia, mania, depression, aggressive and self-injurious behaviour, obsessive compulsive disorder, seasonal affective disorder, substance abuse, hypersexuality, anxiety disorders, bulimia, childhood hyperactivity and behavioural disorders in geriatrics (Sandyk, 1992b).

The highest concentrations of 5HT have been found in the pineal glands of schizophrenics. A dysfunction of central 5HT metabolism in schizophrenia has been repeatedly suggested, and is also implicated in the cyclic seasonal nature of manic-depressives, since there are higher concentrations of 5HT in the summer during the manic phase of seasonally affected people. Schizophrenics often exhibit sleep disturbances; insomnia may be the first symptom of a relapse, whilst changes in REM sleep and in EEG patterns during sleep have been observed. Also arousal level, thus implicating the reticular activating system (RAS), is altered in psychotics. Pathologists have found that the brains of suicide victims are deficient in 5HT. When 5HT levels are low there is an increase in the tendency for people to behave in uncharacteristic ways (Elliott & Holman, 1977).

This dysfunction of 5HT metabolism in schizophrenia has been suggested from studies measuring concentrations of 5HT in urine and blood, in post mortem brains, in cerebrospinal fluid (CSF) and after the administration of 5HT precursors and/or drugs affecting central 5HT turnover. Two possible mechanisms have been suggested both of which result in the formation of psychotropic chemicals such as dimethyltryptamine (DMT) (see Appendix 2) (Rimon et al, 1984). There is a considerable body of evidence suggesting that one defect in schizophrenia may be in the metabolism of tryptophan, and perhaps especially in its uptake into the brain and subsequent metabolism to 5HT.

Another possible link comes from the fact that the acute manic episodes of psychoses such as schizophrenia and manic-depression rarely occur in childhood, and often first manifest at adolescence. Puberty is intimately linked with a massive decrease in melatonin levels, this decrease being the trigger for the onset of sexual

hormone production. There may be a delay in sexual maturation. In some patients an increase in sexual activity may occur during the acute phase and depressed patients lose interest in sexual activity. The increased sexual activity of mania may be due to an altered level or rhythm of melatonin (Roney - Dougal, 1999).

3.3.1. Serotonin and Psychedelics

Jacobs & Trulson (1979) suggest that certain aspects of dreams, drug-induced hallucinations and psychosis share a limited set of characteristics which are directly attributable to decreased 5HT-ergic transmission which is common to all three. This is manifest primarily as changes in visual perception and affect. Additionally, an activation of brain dopamine function may also be involved, either directly or indirectly as a result of decreased inhibitory control over dopamine-containing neurones.

The reasoning behind their hypothesis is that there is a structural similarity between LSD and 5HT molecules, and psychedelics depress central 5HT-ergic neurotransmission. A blockade of central 5HT receptors might account for LSD's psychotomimetic effects. Repeated doses of LSD decrease the number of available binding sites for LSD and 5HT, and affects the affinity of 5HT for its post-synaptic receptor. LSD and other hallucinogenic drugs are potentiated by drugs which depress, and blocked by drugs which increase, 5HT neurotransmission. When LSD is given in conjunction with an inhibitor of 5HT synthesis the effects are synergistic, e.g., depletion of 5HT by reserpine enhances the effects of hallucinogens.

Vollenweider et al (1997) investigated the effects of another psychotropic plant, psilocybin, on cerebral glucose metabolism in 10 healthy volunteers. The data suggest that excessive 5HT receptor activation results in a metabolic pattern that parallels comparable findings associated with acute psychotic episodes in schizophrenics.

Suppression of 5HT neurotransmission alone may be necessary and sufficient for hallucinogenesis, but an added dopamine agonist action greatly enhances the magnitude of the effect. When people having frightening pschedelic experiences are given neuroleptics which have a dopamine antagonist action, they still report experiencing hallucination, but the magnitude of the effect is greatly diminished.

Bufotenine, another naturally occurring psychotropic, shows effects similar to DMT. Body enzymes can produce bufotenine and DMT from tryptamines (Axelrod, 1961/2). These findings further the hypothesis of a role for methylated tryptamines in the origins of psychosis. Perhaps any psychoactive effects of bufotenine result from its conversion to 5-Methoxy-DMT (5-MeODMT)⁷ via the pineal enzyme HIOMT. Bufotenine has been found in the urine of both healthy and psychiatric people. The methylated tryptamines are also normal components of human urine and blood (Callaway, 1994) .

Administration of a variety of hallucinogenic drugs, such as LSD, psilocybin, DMT and 5MeODMT, in very low doses, directly suppresses the activity of dorsal raphe neurons. Subtle alterations of the raphe unit activity may produce dramatic behavioural effects. Because of 5HT's inhibitory synaptic action in the forebrain, this depression of raphe unit activity produces a disinhibition of target neurones in the visual and limbic systems, thereby giving rise to alterations of visual perception and rapid and dramatic changes in mood. The relative potency of these drugs in depressing the discharge rate of these neurons corresponds to their relative potency in various psychological and perceptual measures in humans. Other

⁷ Symptoms of schizophrenia can be exacerbated by giving an antidepressant and MAO inhibitor with an amino acid and methyl donor. Also reserpine, in combination with MAO inhibitors initially increases endogenous tryptamine concentrations as well as psychotic behaviour. Through the enzymatic action of 5-HIOMT (a pineal enzyme), serotonin may be further methylated to 5-MethoxyTryptamine (5MeOT) and 5MeODMT. DMT gives a primarily visual display whilst MeODMT gives more primarily emotive imagery with reports of mental states rather like near-death experiences (NDEs).

psychoactive drugs such as the opiates, atropine and cannabis do not exert this primary physiological action and produce ASCs which are clearly distinguishable from hallucinogenic drugs. Only psychedelics inhibit raphe cell firing without a compensatory increase in 5HT synthesis.

3.3.2. Serotonin and Dreams

The amount of REM sleep in schizophrenics varies; acute patients show reduced REM, chronic show increased. Acute phases are associated with severe sleep disruption with reduction of both REM and NREM. Longitudinal studies show a failure of REM rebound in schizophrenics following loss of REM sleep. Some studies suggest that some schizophrenics have short REM latencies, but there are conflicting results. Reduced REM latency is also found with obsessive compulsives, borderline personality, alcoholism, narcolepsy, schizoaffective disorder. This is possibly due to alterations in the circadian rhythm of REM sleep. It is possible that low REM latency is related to affective symptoms &/or the presence of psychotic delusions. Dreams are dominated by intense visual imagery and affective involvement of the dreamer. Reduced REM latency also occurs with with sleep deprivation.

There is evidence from animal and human studies for a serotonergic involvement in the generation of REM sleep (Mendelson, 1987). The monoamine theory of sleep states introduced by Jouvet (1969, 1972, 1974) implicates the serotonergic neurons of the raphe system (see Figure 1). The discharge rate of 5HT from the dorsal raphe neurones gradually slows as one progresses from the waking state through non-REM sleep until they cease firing completely during REM sleep. Humans show reduction in REM sleep with serotonergic enhancers. Hobson (1992) states that in REM sleep the cholinergic system and its postsynaptic REM sleep executive population are modulated by serotonergic, noradrenergic, and dopaminergic inputs which are in general inhibitory. Noradrenergic neurons are also active whilst we are awake and inactive in REM sleep, so noradrenaline as well as 5HT is inhibitory to REM sleep.

MAO inhibitors and tricyclic antidepressants, such as chlorimipramine, are thought to act by increasing the synaptic availability of 5HT and catecholamines. Chlorimipramine is a strong 5HT reuptake blocker and has been found to be a potent inhibitor of REM sleep. The results obtained with tricyclic antidepressants support the notion that REM sleep depends on the activation state of 5HT-containing neurons. It has been shown that MAO inhibitors consistently suppress REM sleep time through their effect on 5HT; they selectively increase brain 5HT levels without exerting significant effects on other neurotransmitter systems.

Thus, at the cellular level, there is a striking parallel between brain activity following administration of hallucinogenic drugs, and during REM sleep: a significant depression of the electrical activity of the brain's 5HT-containing neurons. The change in raphe unit activity seen spontaneously across the sleep-waking cycle may be the key to understanding altered states of consciousness.

	Dreams	Drug-induced hallucinations
Serotonergic activity		
	v	v
Dopaminergic activity	?	^

Jacobs and Trulson (1979) have two qualifiers to their hypothesis:

- a) dreams, hallucinations, and psychosis are not identical processes. Any two may share properties not shared by the third;

b)that neither 5HT nor dopamine covers any single process indicates that other neurotransmitters are involved in each of the processes, and 5HT and dopamine are also involved in other processes. Yet the overlap of 5HT and dopamine indicates their interaction.

In conclusion, 5HT and melatonin are all implicated in the state of consciousness we call the dream state, a state which has profound similarities to the psychedelic induced state such as is used by shamans for healing and psychic purposes, and to the spontaneously occurring and distressing state experienced by people who in our culture are labelled psychotic. This action of melatonin and 5HT on this primary process consciousness is highlighted by the action of pinoline which is made in the pineal from 5HT, and has been hypothesised as the neurochemical trigger for dreaming.

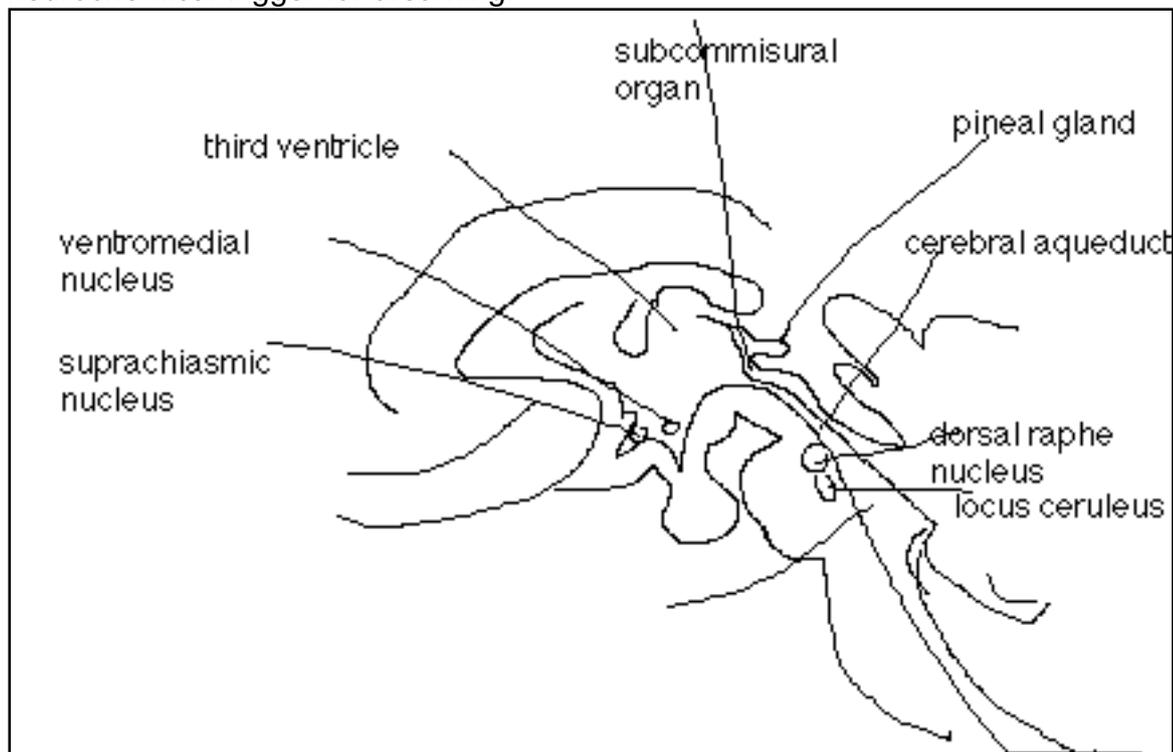


Figure 1. The limbic system, considered the emotional part of the brain, includes the hippocampus, fornix, mammillary body, anterior thalamic nucleus, cingulate cortex and entorhinal cortex. Electrical stimulation of the entorhinal cortex elicits dream-like memories. The hippocampus constitutes a main part of the archicortex, the old arc of cortex, lying on the medial surface of the temporal lobe and composed of the subiculum, Ammon's horn, and dentate gyrus. It receives fibres from the medial and lateral entorhinal cortex, the medial septal nucleus, the locus ceruleus, the dorsal raphe nucleus, and the contralateral hippocampus. Passage of information through the hippocampus is necessary for the storage of new memories. Serotonergic input from the median raphe nucleus seems to have a role in modulating adrenergic receptors in the hippocampus. The hilus of the dentate gyrus receives heavy innervation from both raphe nuclei and the locus ceruleus. GABA has an inhibitory role in the dentate gyrus. A feature of hippocampal physiology is the production of theta rhythm which is related to learning and memory and during REM sleep.

3.4. Pinoline:the link between dreams, psychosis, psychedelics and the shamanic state of consciousness

A tryptoline is a beta-carboline and these are competitive inhibitors of serotonergic uptake, and of the degradative enzyme MAO (Elliott & Holman, 1977). This means 5HT does not degrade properly or get taken up properly which leads it to form compounds such as DMT which is a potent hallucinogen. Naturally occurring beta-carbolines such as pinoline show psychotropic and physiological effects in mammals (Klinker et al, 1997). Pinoline (6methoxy-1,2,3,4-tetrahydro-beta-carboline) is a naturally occurring compound in the mammalian body (Pahkla et al, 1997).

Pinoline has its highest concentrations in the pineal and has been reported to fluctuate in phase with melatonin (Kari, 1981; Kari et al, 1983). It is exceptionally active in that it can

potentiate the activity of 5HT by both inhibiting its presynaptic reuptake and by inhibiting its metabolism by blocking MAO-A. Both of these are used as treatment modalities for depression. (Marcusson & Ross, 1990/2?) Pinoline has also been shown to behave like a hormone (Airaksinen et al 1984) and specific binding sites for pinoline exist in the adrenals as well as the pineal and the brain. Pinoline is probably made from 5HT either via 6-HO-THBC and HIOMT, or via melatonin, 5-MeOT and cyclization (Callaway, 1994). Pinoline is found in the arcuate nucleus, retina and pineal gland (Kari et al, 1983) It has been shown to be an effective benzodiazepine receptor ligand, associated with ethanol dependence, and binds to opiate receptors.

Several people have suggested that the beta-carbolines may play some sort of role in psychosis since they have hallucinogenic effects, but concentrations of pinoline in blood serum and CSF are identical in schizophrenics and controls. Both show a wide range between people, some having 16 times as much as others, and the levels do not correlate with such variables as age, sex, subtype of schizophrenia or duration of illness (Rimon et al, 1984).

Verheij et al (1997) compared plasma levels of the beta-carboline norharman (a harmala alkaloid), concentration of platelet 5-HT, trait measures of anxiety, and measures of coping and defense mechanisms for patients with panic disorder. Platelet 5-HT concentration was positively correlated with the subjectively reported anxiety. Plasma norharman concentration was negatively correlated with defense mechanisms and positively correlated with coping strategies. It was concluded that norharman might reflect intrapsychic and coping processes.

The key factor here concerning pinoline function is that it is chemically almost identical with the harmala alkaloids found in a psychotropic drink, called ayahuasca, used by Amazonian peoples for the purpose of out-of-body experiences, clairvoyance, divination and shamanic healing. In those tribes that have shamans the shaman uses the ayahuasca specifically for connecting with their spirit guide for psychic purposes. The primary function of harmala alkaloids in ayahuasca is to allow for the oral activity of DMT by inhibition of MAO-A, and further permits accumulation of 5-HT and other neurotransmitters. On their own harmala alkaloids have only weak psychoactive effects (Callaway, 1994) but Kim et al (1997) found that the harmala alkaloids which occur in ayahuasca were the most effective inhibitors of purified MAO-A. The psychedelic effects of ayahuasca probably manifest primarily through the serotonergic effects of DMT on the CNS and through increased levels of unmetabolised biogenic amines. Pinoline potentiates the activity of methylated tryptamines and this is the probable mechanism behind ayahuasca (Callaway, 1994) .

Investigation of long term users of ayahuasca showed a statistically significant difference between control group and users with a higher binding density in blood platelets of 5-HT uptake sites in the ayahuasca drinkers. No other pharmacological agent is known to significantly alter values of Bmax binding density, though the density of 5-HT uptake sites may vary considerably from one individual to another. Therefore it is likely that other parameters of the serotonergic system are analogously affected. This indicates a modulatory role for pinoline (the endogenous equivalent of ayahuasca) in the CNS. An upregulation of the serotonergic system is exactly what current antidepressant medications attempt to do, i.e. increasing synaptic 5-HT by preventing its reuptake.

The possibility remains that long term users of ayahuasca may find relief through the tea for inherently high densities of 5-HT uptake sites and that this condition allows them to better tolerate the serotonergic effects of this mixture. In this case ayahuasca can be seen as a form of self-medication for depressive psychological problems. Thus it is possible that ayahuasca may be useful in the treatment of affective disorders (Callaway, 1994).

Betacarbolines are produced from biogenic tryptamines. The search for endogenous THBCs as biochemical explanations for mental illness began in the early 1960s as an extension of the transmethylation hypothesis for schizophrenia (Osmond & Smythies, 1952). Pinoline has been shown to bind to sites in the interpeduncular nucleus. The interpeduncular nucleus, a small area in the basal mid-brain, and its connection to the habenula are essential

for REM sleep. When these connections are cut in rat brain, REM disappears or decreases dramatically.

It has been suggested that mental states of hallucinatory psychosis, psychedelic drugs and dreams all share common features. Callaway suggests that psychoactive tryptamine derivatives in the CNS of mammals play a role in the manifestations of visual and emotive phenomena during normal dream sleep. The endogenous activity of these rapidly metabolised methylated tryptamines is suggested to be promoted through the regular and periodic inhibition of MAO-A by endogenous betacarbolines. The hypothesis is extended to include psychoses by suggesting that hallucinatory psychotic episodes may result from a desynchronised dream mechanism, where the individual essentially dreams while awake (Callaway, 1994).

3.4.1. The 40Hz EEG links between schizophrenics, ayahuasca users and psi experiences

Don et al (1989) report increased 40HZ EEG activity associated with clairvoyance hitting in an exceptional psychic, this being repeated with another person in a later study (McDonough,1989). Don et al (1996) recorded EEGs from 11 members of a Brazilian shamanistic religion which uses ayahuasca. Analyses showed increases in power in the 40 HZ region, consistent with reports that ayahuasca intensifies visual imagery. They interpret these results as supporting the proposal by Llinas & Ribary (1993) that the 40HZ rhythm is linked with the consciousness-generating mechanism which produces the REM state, hallucinations and daydreaming states, and further suggest that this "may also underly the conscious elaboration of initially unconscious or preconscious psi information." They think that the claimed psychic effects of ayahuasca are due to 40 Hz brain activity making unconscious psi information available to the conscious mind.

Don & Moura (1997) analysed the EEGs of people claiming contact or abduction UFO experiences who later spontaneously had altered states of consciousness or trance experiences. This showed a state of hyperaroused trance in which the muscles were relaxed and immobile whilst their EEGs exhibited high frequency 40 Hz beta activity at all 19 electrode sites, with maximum activity at the prefrontal and adjacent loci. There were intermittent trains of rhythmic approximately 40 Hz activity attaining very high amplitudes at times exceeding 40 microvolts, which was distinct from muscle discharge, significantly more in trance than in baseline. Also the dominant alpha frequency increased during trance. There have been numerous observations of increased fast beta activity in schizophrenia patients (Itil, 1977) but this tends to include delta, theta, alpha and low beta activity as well. Also in schizophrenia the beta activity is observed mostly at sites posterior to the frontal scalp. Most importantly UFO experiencers can voluntarily commence and terminate the high frequency activity which was only present in the trance condition; voluntary control is not found in schizophrenics. Das & Gastaut (1957) found a similar EEG in a yogi in advanced meditation, in the state of samadhi. They suggest that UFO experiencers enter this ecstasy trance state, some of the experiencers reporting feeling that they were linked to a higher consciousness and sometimes connected with a non-human being or even with God. The difference is that samadhi is experienced after years of training whereas the UFO people experienced it as a result of their abduction of contact.

Llinás has proposed that the thalamic intralaminar nuclei which comprise the diffuse thalamic system generate 40 Hz activity which integrates corticothalamic activity and so bears importantly on consciousness. Sheer (1984) found that scalp-recorded 40 Hz was associated with focused arousal and learning tasks. It appears that as the focus of attention sharpens, the integrative activity of the thalamic system increases through the action of 40 Hz rhythms. Apparently when attentional focusing becomes laser-like an extreme state of corticothalamic integration occurs and with it an amplification of normally unconscious brain activity, with a higher-order self or personality prevailing which seems to transcend time and space. However the UFO experiencers did not show the high frequency brain activity widely spread all over the

scalp as did the yogis. Theirs was centred on the prefrontal loci of the brain. In samadhi one experiences Divine Union. The UFO people experienced a wider range of phenomena.

This EEG research supports the neurochemical findings with regard to the commonalities between the various primary process states of consciousness of psychics, spiritual people and visionaries. In section 4.2. we will look at Llinas hypothesis which links these with the dream state of consciousness.

4. States of Consciousness: The Link between Psychosis, the Psychedelic Experience and Dreams

What is central to the psychedelic, the shamanic and the psychotic is a state of consciousness often described as hallucinogenic or hallucinatory. In this state of consciousness one experiences reality in mythic archetypal thought patterns, often called primary process thinking. Many scientists, such as Noll (1983), consider that: "Hallucination almost invariably carries with it the frightening connotation of psychosis, especially if it occurs repeatedly." Yet, this state of consciousness is experienced by all humans every night when we are dreaming. Every 90 minutes we experience a dream lasting on average 20 minutes; therefore 19.4% of every night's sleep is spent dreaming with an average of 4 - 5 dreams a night. The fear surrounding hallucination is profound in our culture but is not so marked in cultures which regularly use psychotropic plants. Our fear has led us to consider hallucinations as unreal and delusions. However, they are frequently used by primary process consciousness to impart information to us in the mode which is appropriate for that state of consciousness and the more familiar we become with that state the less frightening is the hallucinatory mode.

The link between dreams and psychosis has been remarked on often through millennia, e.g. Plato, Aristotle, Kant, Freud. Moreau (1845) remarked also on the similarity with drug induced hallucination. Thalbourne (1996) has proposed the concept of transliminality to describe the state experienced, which he defines as:

"Transliminality, or the ability to cross the threshold, is the name that has been given to the common factor that has been found to underlie creative personality, mystical experience, psychopathology of the schizotypal and manic-depressive kind, and belief in and alleged experience of the paranormal. Other core constituents of transliminality are religiosity, frequency of dream-interpretation and fantasy-proneness, dream recall and hyperaesthesia."

4.1. Dream Sleep and Psychosis

Since the 50's there has been speculation that sleep, dreams and psychosis are interrelated. Dement (1960) in the classic study on dream deprivation in which 8 young men were awakened every time they started dreaming, for several consecutive nights, found that on the first night of dream deprivation, the return to sleep initiated a new sleep-dream cycle, and therefore there were 4 - 5 attempts to dream. On each subsequent night the time elapsed between returning to sleep and starting to dream decreased dramatically, i.e. there was a progressive increase in attempt to dream for all subjects, from 11 - 30 awakenings in a night. Every subject had the first minute or two of dreaming so the deprivation was 65 - 75% complete.

Then they were allowed recovery nights when they could sleep and dream without disturbance: the first night they dreamt for 26.6 - 29% of the sleeping time. They required up to five nights before a return to normal patterns was complete. If one is woken in between dream periods there is no subsequent increase in dream times so these effects are not due to repeated awakenings affecting sleep pattern.

Psychological disturbances such as anxiety, irritability, and difficulty in concentrating developed during the period of dream deprivation. Three subjects stopped early - one after two nights and two after four nights, presumably because the stress was too great. One subject exhibited severe anxiety and agitation, 5 developed a marked increase in appetite. These

changes disappeared as soon as they were allowed to dream again. "It is possible that if the dream suppression were carried on long enough, a serious disruption of the personality would result" (Keshaven et al, 1990).

Granek et al (1988) consider that sleep disorders generated by chronic use of psychostimulants, such as opium or khat, may generate, in the long term, hypnagogic experiences during daytime. REM suppression and subsequent REM rebound have been described among chronic users of amphetamine and cocaine. The striking similarity between daytime hallucinations of the psychotic and dream experience has prompted research in the EEG patterns of schizophrenia patients during sleep. The hypothesis is that intrusion or leakage of REM sleep phasic events into waking would contribute to a disorder of attention and perception.

A large majority of schizophrenics complain of poor sleep; they show a fragmentation of sleep and decrease in total sleep time (see section 3.3.2). Schizophrenics have a reduction in stage 4 sleep (delta slow wave sleep (SWS)), this being found also in normal elderly people, in those with major depression, mental retardation, when under stress and those with chronic dementia. The major deficit in delta occurs in the first NREM period. Adolescence, which is frequently when schizophrenia begins, is characterised by quantitative decline in sleep, the time spent in stage 4 (SWS) declines by 50%, the amplitude of delta waves declines by 75% between 10 - 16 years of age. SWS deficit may also be related to anxiety or to overarousal rather than to psychosis, (Keshaven et al (1990).

4.2. Shamanic trance characteristics

The following characteristics are typical of shamanic experiences, though every culture has some differing characteristics which are peculiar to that culture:

- a) Belief in aerial voyage of trancer - this is probably the most consistent belief across all cultures linked with the shamanic experience;
 - b) spirit helpers of plants, e.g. mescalito by users of the peyote cactus, are evoked by users;
 - c) healers divine the future and make prognosis of illness, this has already been exemplified by traditional usage of ayahuasca;
 - d) rituals associated with trance state: all shamanic cultures use ceremony and ritual in conjunction with the psychedelic plant, or other methods of achieving the trance state of consciousness;
 - e) music an integral part of ritual - this is commonly chanting or drumming;
 - f) the song guides the trance - this is especially true with ayahuasca ceremonies;
 - g) women are involved in healing rituals generally after menopause - presumably because pregnancy requires the women to abstain from psychedelic plant usage and hallucinogenic plants are not given to pre-adolescent children;
 - h) man/animal transformations utilising plant;
 - i) recruitment to shamanistic role is idiosyncratic based on personal attributes - this I shall look at more fully in a moment; it may also run in families;
 - j) no metaphor of possession by alien spirit force;
- (Dobkin de Rios, 1986)

Dobkin de Rios also mentions the following characteristics which are found also in psychotic and psychedelic experiences:

- experience of time as highly accelerated or imperceptibly slowed;
- death of ego/rebirth phenomena reported;
- quality and intensity of altered state unpredictable;
- fear of death.

Since the turn of the century psychiatrists have noticed the similarity between acute psychotic breakdown and shamanic trance states. It is an interesting historical exercise to read through the reports over the past 50 years, because one sees primarily how the same data is

interpreted according to a changing Western attitude. Initially one had titles such as "Shamans as Neurotics" (Devereux, 1961) in which the shamanic trance state was identified as psychopathological. The following quote is a good example of the sort of thinking at this time. Devereux lists various authors, poets, composers who were considered to be mentally unstable and offers the opinion that their insanity was a part of their creative genius, and that "the problem is . . . we view the finding that neurotics and/or more or less latent psychotics can perform culturally valued social functions, as a slur and as an aspersion on culture and society." Interestingly this attitude still holds today - but today shamans are seen as healthy members of their culture, and I am now arguing that many psychotics in our culture could be healthy and valued members of our culture, if only they were assisted through their initial breakdown and taught how to grow through and ground their experience, rather than being hospitalised and treated with drugs.

Part of the shift in attitude is seen in the 1980's when great efforts were made to show that shamanic trance was not the same altered state of consciousness as the psychedelic or psychotic experience, that it could in itself be psychotherapeutic and that the shaman was not neurotic or psychotic (Noll, 1983). This is valid. All states of consciousness are unique to themselves. What I am trying to show in this paper though is that they are on a continuum from the dream state through the psychedelic and shamanic states to acute psychotic breakdown, and the same underlying primary process, mythic mode of thought is common to all.

The visionary state is considered to be the essence of the shamanic complex. I think that many young people have an inherent and strong urge to experience ASCs. Noll (1983) also remarks on this. The shamanic trance is a state of consciousness that has been utilised among many human cultures across human history. More pertinent to my thesis here though is the famous "initial call" of some shamans, which mark the person out as having a particular gift, a "greater liability to easily experience ASCs in whatever form, thus marking him or her as a prospective candidate for shamanic training." (Noll, 1983) The important fact here is that after the initial call experience the budding shaman is then taught by the resident shaman how to control their gift for the good both of their society and for the person who has the initially uncontrolled experience. The tragedy in our society is that people having this experience are not recognised and not helped to control the experience.

Always in human behaviour there is an interaction between state vs trait factors, between personality and behaviour derived from genetic, constitutional traits (Allport, 1966 et al) and behaviour which is best understood within the context of psychological states linked with the environment (James, 1890) in which the interaction of the person and the situation accounts for more variance in behaviour than the person or situation alone. Thus in a shamanic culture the experience of an uncontrolled ASC will be interpreted and dealt with completely differently from someone having that experience in the modern Western culture. An experience within an ASC cannot be easily regarded as "legitimate" or "real", the interpretation is almost totally culture dependent.

For example the Western medical model "views behavioural disorders as displays of symptoms of underlying psychological "disease entities." Labelling someone as "ill" places them in a dependent and therefore inferior role in our society. Such labelling may have dire consequences for the person stigmatised by the disease syndrome tag. The ASC experience by orthodox Western psychological standards is "sick", "inferior" or "pathological". Tart (1975) notes that an implicit assumption in Western cultures is that deliberately "cultivating ASCs is also a sign of psychopathology."

I am not the first to note this comparison. Silverman (1967) argues that the onset of acute schizophrenia in our culture is analogous to the "initial call" of the shaman, as described by Eliade (1964) and others. Eliade's chapter on initiatory sicknesses and dreams centres on their importance in Siberia and elsewhere as a transformation process: "They transform the profane, pre-choice individual into a technician of the sacred." Laing (1967) claims that "no age in the history of humanity has perhaps so lost touch with this natural healing process that implicates some of the people we label schizophrenic." Shamanic techniques are described as

closely resembling certain psychotherapeutic techniques in our own culture by Murphy (1964) who sees “the process of shamanism as ‘whole man’ therapy” and by Peters and Price-Williams (1980) who compare it with the various types of “waking dream” therapies, especially with the process of “active imagination” in Jungian psychotherapy. Both shamanism and schizophrenia are subject to colourful romanticization

4.2.1. Differences between the Shamanic State of consciousness (SSC) and schizophrenia

Volition

“By far the most important distinction between the SSC and schizophrenic state is that the shaman voluntarily enters and leaves his ASCs while the schizophrenic is the helpless victim of his.” (Noll, 1983)

The shaman willfully induces his ASCs, and the evidence suggests that except in the case of the ingestion of certain hallucinogens, the shaman can also willfully return from his altered states. The shaman has a conscious, purposive, social function for entering the SSC. Control of the shaman’s ASCs is the most important criterion. Hartner (1980) adds: “Indeed, the ability of the master shaman to operate successfully in two different realities is seen as evidence of power.” This “shamanic balance” has been lauded by others and is a sign of the high adaptability of shamans in maintaining their levels of social and occupational functioning despite repeated ecstatic experience in altered states.” (Noll, 1983)

Form and content of thought

The negative, involuntary themes of intrusion so common in schizophrenia are absent in shamans. However, similar themes are found in states of involuntary or unsolicited “possession trance” or “spirit possession.”

The distinction between the baseline, or ordinary SOC, and nonordinary states, between the outer and the inner, is a distinction that the schizophrenia simply cannot always make. This does not appear to be true of most shamans studied by ethnographers, and probably results directly from their many years of training. The validity of both realms is acknowledged by the shaman, whose mastery derives from their ability to not confuse the two.

Perception

All experiences in ASCs are ultimately hallucinatory from the cognicentrist point of view. For example, the schizophrenic may be victimised by voices, mercilessly criticised and mocked by them, and the voices cannot be made to stop through the volition of the schizophrenic. For the shaman, there is an auditory component to the SSC, but it is usually of a positive, helpful, healing nature, and the advice given by “spirits” is willfully sought out by the shamans. This is due to the positive emotional psychological state of the shaman versus the frightened, confused state of the psychotic. What we experience in our minds is so strongly derived from what we heard as children from family, peers and society in general. Western society in general is so sick that our hallucinations torment us.

Affect, sense of self, and relation to the external world.

Murphy notes . . . that “for a shaman to become a successful healer he had often to display an exceptional ability in emotional control and in taking responsibility.” Butt (1966) says that among the Akawio, any shaman who manifested psychopathy (such as loss of emotional control and inappropriate expression of affect) “would be regarded as inappropriate and likely to scare away patients rather than encourage them to apply for aid.”

The point that comes across so strongly here is that shamans are healthy people, who have not been subjected to abuse, not been told that they are sick, stigmatised, put down, so they can utilise the experience rather than being terrified by it and losing control over it, with the voices being helpful rather than condemnatory, their emotions being healthy rather than having to cut off from feeling because it is all so scary. What are we doing to these sensitive people in our midst? What tragedy is being committed to so many sensitive souls that they have to live a nightmare rather than fulfilling their birthright and growing into spiritually whole people?

4.2.1. Specific commonalities between psychotic and psychedelic states of consciousness

Fischman (1983) points out that:

- a) the initial acute incidence of schizophrenia is marked by visual hallucinations, which are similar to psychedelic hallucinations. In longer term chronic patients one gets more auditory hallucinations;
- b) The experience of heightened sensory awareness is common to psychedelic states and to acute psychosis. This shows up in psychophysiological, e.g. GSR, studies. There are two related reactions:
 - i) ordinary intensity stimuli are experienced more intensely than normally,
 - ii) less sensory information is necessary in order to report that a stimulus is present.
- c) Awareness of "significance," the sense of special significance, the experience of expanded relevance or meaning, is the initial stage in the development of delusional thinking. The primary delusional experience is fundamental to psychedelic states and in incipient psychosis.
- d) The behavioural withdrawal of some schizophrenics is similar to those who unwittingly ingest hallucinogens without knowing they are doing so and who then become extremely frightened and withdraw.
- e) Both psychotics and those taking a psychedelic trip have difficulty expressing thoughts: rambling, incoherent, word salads become charged with symbolic meaning so that one may effect a union between the word and its object.
- f) The earliest affective changes in schizophrenia are often pleasurable and exhilarating like a psychedelic trip. Anxiety and dysphoria occur later as people feel they are losing control over their thoughts. One gets the same in LSD use. Hypnagogic phenomena, such as daydreams, are prototypical of this: internal processes can no longer be distinguished from external ones; sensory phenomena strike the weakened ego boundaries with unaccustomed impact; colours and sounds appear to have increased intensity; the distinction between self and non-self is blurred; the notion of causality is affected.

4.2.2. Psychological Correspondences between Dreams, Psychosis and Psychedelic States of Consciousness

The psychedelic state has its basis in a primary loss of ego boundaries. Accurate perception of reality depends upon the ego's continuous synthesis of self-representations to form a constant frame of reference, a continuous coherent self. The disruption of this in dreams, psychedelic states and psychosis leads to a chaotic condition in which various ego states succeed one another without a common reference point. This renders a loss of temporal continuity to experience, characterised by a weakening of the ego's identification with the self - a separation of body and soul, e.g. "I feel like I'm a bystander watching myself." The observing self becomes dissociated from the experiencing self. Eventually the connections may be lost; the ego may identify with one or another self-representation, but can no longer identify with a coherent self. This estrangement is the fundamental process which is seen alike in dreams, psychedelic states, acute psychosis and even in everyday daydreams. Our whole relation to the external world, to reality, depends on our ability to distinguish between perceptions and ideas, and this depends on our capacity for reflective awareness. Reality testing requires an ability to represent oneself as thinker of the thought - reflective self-representation. In dreams, hallucinogenic drug states and psychosis reflective self-representation is lost and primary process thinking predominates.

Secondary process thinking depends on:

- a) the capacity to maintain a constant inner representation of the self and of objects;
- b) the capacity to distinguish between self and object and thus between internal and external phenomena;
- c) the capacity to shift from "thing-presentation" to "word-presentation."

In primary process thought one is unable to transcend immediate sensory impressions and so move on to secondary process thinking and the level of concepts and abstraction. In a dream everything is experienced much more immediately. In primary process thinking images predominate, i.e. thoughts (word-presentations) are transformed into images (thing-presentations) (Fischman, 1983). "The relationship to objects, including people, takes on an unusual quality and depth and an immediacy which dissolves the ordinary experience of continuity" (Fischman, 1983). It is this quality of vivid, immediate sense-imagery which characterises the primary process.

In dreams, in LSD states and in psychosis, words undergo condensation and displacement via the primary process. Words are not conceived as symbols of objects but as objects themselves. In dreams visual percepts are treated concretely as objects and as such, are subjected to the transformations of the primary process. In all three states (dreams, schizophrenia, LSD) the net effect of these transformations is a tendency toward concretization, which one also gets to some extent in the hypnagogic state. Abstract thought thus becomes mythic thought.

All three show an altered experience of time: timelessness, time standing still or time slowed down. The dreamer's time sense is in the present. Only the present is real - past and future are exceedingly remote. All thinking occurs in the present tense. To differentiate memories and expectations from present events, one must appreciate the relationship between the self-representation associated with the memory or expectation, and the self-representation associated with the present thought. If this relationship is not appreciated the distinction between past, present, and a future dissolves. In dreams, psychedelic states, and psychosis, the normal continuity of experience is disrupted.

Also similarities between certain stages of psychoses and psychedelic states are worth noting. Ideally the psychedelic chemicals hold out a hope for understanding and perhaps improving certain aspects of mental health. The psychedelics exhibit a high therapeutic index and their use has not been associated with physical dependence. DMT is a normal component of human blood. Psychedelics influence the mind in such a profound manner because their structure is very similar to naturally occurring compounds; the mere capacity for such an experience suggests that the psychedelic state is inherently fundamental to aspects of our psyche that are normally inaccessible during the waking phase of our lives (Callaway, 1994).

4.2.3. The Dream State of Consciousness is Primary

Linás & Paré (1991) suggest that from the standpoint of the brain's thalamocortical system, dream sleep and wakefulness are almost identical intrinsic functional states in which subjective awareness is generated, although the handling of sensory information and cortical inhibition is different. They consider wakefulness is more highly coherent and more strongly modulated by sensory input than is dreaming.

In general, the averaged evoked potentials (AEPs) recorded from the scalp in response to sensory stimulation during waking and REM sleep are very similar and differ strikingly from those recorded during non-REM sleep. With auditory stimuli the early component is the same when awake or asleep, the middle-latency component differs but returns to normal, or surpassed waking values, in REM sleep. Thus sensory stimuli may be embedded in an ongoing dream or trigger a specific dream sequence, in which such stimuli is a nucleating point. Or these stimuli may be integrated into cognitive constructs in which their significance may be quite different from that in the waking state.

The central paradox of REM sleep is that stimuli which are perceived in the waking state do not awaken people in REM sleep, even though the amplitude of the evoked cortical responses is generally similar to, or higher than, in the waking state. In other words, although the thalamo-cortical network appears to be at least as excitable during REM sleep as in the waking state, the input is mostly ignored.

The late potentials following sensory stimuli are abolished in REM sleep, and this suggests that the ongoing activity that generates cognition during dreaming prevents unintegrated sensory stimuli from being incorporated into the intrinsic cognitive world. Linás & Paré suggest that mentation during dreaming operates on the same anatomical substrates as does perception during the waking states. *Thus REM sleep can be considered as a modified state in which attention is turned away from the sensory input, toward memories. And wakefulness is nothing other than a dreamlike state modulated by the constraints produced by specific sensory inputs.* Remove sensory input and we tend to fall asleep, e.g., many beginners in meditation fall asleep on relaxing and closing their eyes. We slip into day dreaming and spacing out whenever we are given even half a chance.

Only a minor part of the thalamocortical connectivity is devoted to the transfer of sensory input. Rather, the thalamocortical network appears to be a complex machine largely devoted to generating an internal representation of reality that may operate in the presence or absence of sensory input. All sensory messages reach the cerebral cortex through the thalamus, except olfactory. The connectivity between the thalamus and the cortex is bidirectional. Thus the essence of brain function seems to be that of generating the functional scaffolding required to create an internal image consistent with external reality. Most of the connections necessary for this are present at birth, i.e. our cognitive capacity is truly a priori. Even though the mechanisms necessary for its generation are present at birth, the emergence of self-aware consciousness arises out of interactions between the brain and its environment, and from birth onwards there is dream type primary process thought which gradually develops to the adult type secondary process thought mode.

The membrane properties of neurons allow them to oscillate or resonate at different frequencies and this intrinsic activity may play a fundamental role in CNS function. Recent evidence indicates that neuronal activity in the spinal cord is at the foundation of walking and other movement. In this context, the function of sensory input in, e.g. walking, is to modulate the intrinsic oscillatory properties of the spinal cord network in order to adapt it to the irregularities of the land in which one moves. Higher in the brain, the function of the neuronal system is determined by its connectivity and also is directly related to the membrane properties of the neurons. For example, the thalamus is capable not only of controlling the transfer of sensory input to the cerebral cortex but also of expressing its own electrical activity, these two aspects of thalamic functions being intimately related, which suggests that the brain is essentially a closed system.

Thus functional states, such as wakefulness or REM sleep, appear to be just two examples of the multiple variations provided by the self-generated brain activity. Sensory input plays an extraordinarily important but nevertheless a mainly modulatory role. Sensory cues gain their significance by virtue of triggering a pre-existing disposition of the brain to be active in a particular way.

It has been hypothesized that the thalamus is involved in the 40 Hz activity (see section 3.4.1). Reticular thalamic nucleus cells are responsible for the synchronization of the 40Hz oscillations in distant thalamic and cortical territories. If we assume that a function of this 40Hz activity is to maintain a general, continuous neuronal humming against which intra- or externally generated “irregularities” can stand out, the importance of a structure which could communicate this irregularity to other neuronal groups becomes self-evident.

In conclusion, Llinas and Pare propose that wakefulness and REM sleep are fundamentally the same type of functional state and that the main difference between them lies in what particular input is most prevalent. The most fundamental conclusion to be drawn is that consciousness is an intrinsic property arising from the existing disposition of the brain to be active in certain ways and it is a close kin to dreaming. This implies that secondary qualities of our senses such as colours, smells, tastes and sounds, are inventions of our CNS which allow the brain to interact with the external world in a predictive manner. The degree to which our perception of reality and “actual” reality overlap is inconsequential as long as the predictive

properties of the states generated by the brain meet the requirements of successful interaction with the external world.

That consciousness is generated intrinsically is not difficult to understand when one considers the completeness of the sensory representation in our dreams, or in psychotic or psychedelic hallucinations. The possible intrinsic nature of consciousness has serious implications for our understanding of psychiatric conditions characterized by illusional states in which the intrinsic view of reality and the emotional states generated by them are in discord with the perception of other individuals in the same social setting. If the thalamocortical system is ultimately responsible for the generation of consciousness, individuals who experience certain forms of hallucinatory states may be convinced that their hallucination indeed corresponds to events in the external world. Since attentiveness is selective, the lack of responsiveness of a person dreaming, hallucinating or deep in thought is because consciousness does not necessarily heed external reality.

5. The Changes Needed in Our Society

- 1) the recognition that altered states of consciousness are natural, the baseline functioning of the brain and the primary mode of consciousness.
- 2) the recognition that the psychedelic state of consciousness is experienced by every human every night, four times a night on average, and we call this dreaming.
- 3) the recognition that some initial acute psychotic breakdown experiences are a dream out of control, and if accepted, and support given, that the person has a strong probability of waking out of it sooner or later.
- 4) The recognition that in some cultures this experience is considered to be a sign of a great gift and the person can be trained as a wise healer and helper who can connect with the spirit world for the good of the community, and may have special psychic gifts which can be used to help others.
- 5) The recognition that antipsychotic drugs may be unnecessary or harmful in the treatment of many psychotics. Long term treatment with antipsychotic drugs creates dopamine receptor super-sensitivity, worsening the underlying biochemical deficit of schizophrenia. Withdrawal of antipsychotic drugs may cause a rebound of schizophrenic symptoms to a higher level than would have been the case without treatment. Most good prognosis schizophrenics do better without drugs and drug treatment is less necessary for patients in low-stress settings. Good social support and opportunities are related to better outcomes, whereas effectiveness of medication is at best related to only a 20% recovery rate and one also gets severe side effect problems. Therefore people are being exposed to damaging and ineffective intervention. "The overriding need to control the mad, along with their lack of power to protest about their treatment, can be the only explanation why this prevalence of medically induced brain damage is considered acceptable by professionals" (Warner, 1985) - and the public!! The drugs would be banned if used on sane people. Psychiatrists have become agents of social control: we are happy to hand over the responsibility for managing mad people to them. We are ill-informed as to the nature of mental illness and treatments and to the loss of civil rights of ordinary citizenship of people who suffer such an experience.
- 6) The reality of the social aspects are that schizophrenics tend to be unemployable, homeless, sad, lonely and scared. Whether they get better depends more on the political processes. Revolving door patients are created by the use of drug treatment coupled with neglect of the psychosocial needs of the person. Psychotic patients who are working stay out of hospital longer than unemployed patients. Appropriate work such as gardening appears to be of great benefit and long term secure and non-stressful work is the best. At the same time there needs to be adequate psychological support in the community with education concerning tolerance of our differences, adequate material support giving a reasonable standard of living with housing stock available, support for the family, democratization of services so that

patients can have a say, availability of non-coercive, non-invasive methods of helping, places to go and be with others, and to remove the stigma of mental illness (Warner, 1985).

I wonder if the monastic system was created because of the need for some sensitive young people to have a stress-free environment in which a basic routine is established with an early-to-bed early-to-rise rhythm, very simple basic food and plenty of physical work outdoors. This is exactly what is needed to help ground someone who is liable to "dream whilst awake." Coupled with elders who understand mystical and psychic states of consciousness we have here perhaps the early roots of the monastic system in societies which were just developing out of the shamanic spiritual system. This is possibly seen most clearly in the present day Tibetan monastic culture. I know that the Tibetan monastery Samye Ling in Scotland has sometimes taken in people who were referred by the psychiatric service in South West Scotland.

Pilgrim (1990) points out that madness has existed in all societies, but the particular way it is understood both in terms of causes and way in which one responds to it, and words used to describe it, vary over time and place: some societies counsel and tolerate, others segregate and medicate. In the West, systematic psychological theorizing has been heavily biologically orientated, evading sociological and anthropological models of deviance.

Tarrier (1990) also adopts a biopsychosocial model: he considers that vulnerability to schizophrenia is a permanent trait, schizotypy, and episodes of illness occur when stress levels reach the person's vulnerability threshold. If the person has relatives who are high on the expressed emotion scale with a high frequency of critical comments, high hostility, marked emotional over-involvement, low emotional warmth and low frequency of positive comments, then one gets a particularly high relapse rate, the schizophrenic showing high arousal and hyper-reactivity to social stressors. Family therapy shows a reduced relapse rate: family intervention and social skills training combined give best results of all. All successful studies include an educational component and interventions that reduce stress in the family environment. Poverty and lack of social services exacerbate symptoms. Therefore, we need more emphasis on the social aspects of treatment. "Perhaps the most shameful consequence of the dominant role that biological psychiatry has gained in mental health care is the almost complete absence of these kinds of services" (Tarrier, 1990).

In tribal societies healing ceremonies for psychotics are a communal process, and the person may well be adopted by another social group which gives them additional social support and status, a new social role and home. The communal ritual procedures are a symbolic recognition that illness is a problem for the community as a whole. Social isolation, alienation and stigma are one of the strongest predictors of poor outcome in schizophrenia. Broad group participation in healing not only aids the reintegration of the patient but is also a necessary and powerfully effective element in the treatment of emotional illness. Any form of treatment which does not receive full community endorsement has a limited chance of success. Extended families are related to less over-dependence and emotional over-involvement or demands: this is good for recovery. Community involvement also reduces family tensions because responsibility is shared broadly. Therefore in the Third World the psychotic retains their self-esteem and feeling of value to the community and their sense of belonging (Warner, 1985).

Conclusions

Melatonin and pinoline, made by the pineal gland and regulated by the seasonal changes in light and darkness is linked to the sleep/wake cycle and also possibly the onset of dreaming. Lack of sleep for several nights is often linked to the onset of acute psychotic breakdown in which the person starts hallucinating or "dreaming while awake." This state of consciousness is common to the dream state, the psychedelic state, and the shamanic initiation experience. Through dreaming we access the primary process aspect of our psyche, the language of myth, symbol and archetype, which are normally inaccessible during waking

consciousness and in this sense dreams share a qualitative commonality with certain types of psychoses and psychedelic states (Callaway, 1994). Thus dreaming which is known to be a psi-conducive state is one end of a continuum which extends next to the psychedelic state, which has not been shown to be psi-conducive, to the shamanic experience which has a reputation of being highly psi-conducive, to the acute psychotic state which also has a reputation of being psi-conducive. I suggest that we are dealing with the same underlying neurochemical pathways which in turn lead to an essentially similar state of consciousness, and that it is only in Western society that the potential shaman, with all of their psychic gifts, is ignored and treated as sick. All other human societies have honoured their prophets, psychics, seers and shamans.

We need to learn to recognise the potential shaman in our midst and re-learn what is required to ground them, teach them and train them so that their creative and psychic abilities can be a gift, not a curse, and can be used for their and our benefit.

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