# Text extracts F6 – Brain Central Control

'[…] Malnutrition could contribute to neurotransmitter disturbances…neurotransmitter disturbances could be related to …fluid or electrolyte abnormalities.' (Anderson & Kenedy 1992 p.120)

The following extracts review some aspects of the role of the brain in health, which are rarely put together into a coherent 'big picture'. This hides both 'whence' our focus on the brain comes, and 'where' it leads.

### *Double-binds: activated head and its lateralisation*

- 'When the parts of the body and its humors are not in harmony, then the mind is unbalanced and melancholy ensues but on the other hand, a quiet and happy mind makes the whole body healthy' (Aristotles)
- 'When the members work joyfully, The head rises grandly; And the duties in all the offices are fully discharged! [...] When the head is intelligent, The members are good; And all affairs will be happily performed! [...] When the head is vexatious, The members are idle; And all affairs will go to ruin! (Waltham 1971, *Shu Ching, Yi and Chi p.35)*
- 'Laterality –it must be right – … Children who… are poorly lateralized, and who are emotionally unstable or immature are all likely candidates for dyslexia. There is no reason why the remedy for such deficiencies could not be carried out within the school itself. […] No doubt someone will ask, "What about the cost?" Surely to humanize a little child and make him into a man is something beyond price! '(Tomatis 1991 pp.168,169)
- 'By taking readings on hundreds of people, Dr. Davidson has established a bell curve distribution, with most people in the middle, having a mix of good and bad moods. Those relatively few people who are farthest to the right are most likely to have a clinical depression or anxiety disorder over the course of their lives. For those lucky few farthest to the left, troubling moods are rare and recovery from them is rapid. […[…] was there something about the training of lamas - the Tibetan Buddhist equivalent of a priest or spiritual teacher - that might nudge a set point into the range for perpetual happiness? Perhaps luckily, there is a catch: almost no one can read these moments. […]reading microexpressions, and seeks to help people better manage their emotions and relationships […]Finally, the scientific momentum of these initial forays has intrigued other investigators. Under the auspices of the Mind and Life Institute…' (Goleman 2003)

'In short, the results suggest that the emotion set point can shift, given the proper training. In mindfulness, people learn to monitor their moods and thoughts and drop those that might spin them toward distress. Dr. Davidson hypothesizes that it may strengthen an array of neurons in the left prefrontal cortex that inhibits the messages from the amygdala that drive disturbing emotions. Another benefit for the workers, Dr. Davidson reported, was that mindfulness seemed to improve the robustness of their immune systems, as gauged by the amount of flu antibodies in their blood after receiving a flu shot. […]The mindfulness training focuses on learning to monitor the continuing sensations and thoughts more closely, […]What difference such intense mind training may make for human abilities…' (Goleman 2003 – see <Extracts F10\ Left-Right>)

### *The brain for health*

The role of the brain and that of the mind in stabilising health is covered by a great amount of literature, Western and Eastern, conventional and alternative. Some examples are:

Laughlin et al. 1990, Wickelgren 1997; Khalsa & Stauth 1999, Sapolsky 1994, Dupont 2000, Parasuraman 1988, Philpott et al. 2000, Peck 1996; Fehmi & Fritz 1980, Feldenkreis 1981, M asters 1994, Khalsa & Stauth 1999, Rossi 1996, Axelsson 2001, Leonard & Murphy 2003, Weil 1985, Harris 2002.

### *'Brain, pain, drain'*

- "The brain, the pain, and the energy drain!" … is how Charles Lapp, M.D. of the AACFS… describes CFS and FMS. […] sleep disorder is one of the symptoms… […] IF you ask people why they visit the doctor, Jason states that the number one reason will be due to fatigue. Yet if you turn the situation around and ask health care providers (doctors)… "Fatigue will be at the bottom of their list!". So biased perceptions about fatigue play a rle in defining "who" receives the diagnosis of CFS.' (Thorson 2003 p.9) […] *'Biochemistry of CFS:* The AVP is an enzymatic process that exists within the body's white blood cells, called lymphocytes. […]These [pro-inflammatory] cytokines are produced by "activated" glial cells in the spinal cord. The glial cells become activated by any type of infection (not just viruses) physical trauma or tissue damage. […]The purpose of the AVP is to activate an enzyme (Rnase L) to degrade RNA in order to halt protein synthesis, which in turn prevents the viruses from replicating. […] Chronic activation of the AVP interferes with protein synthesis […] In CFS patients, Suhadolnik found that two types of Rnase L enzymes are present in a majority of patients. […] The smaller enzyme works three times faster than the larger enzyme to breakdown RNA. (Thorson 2003 p.11)

- 'Headache is probably man's Number One malady. […] Headaches have been with us for a long time. […] Between headaches the migrainous individual is usually perfectionistic, productive and unusually healthy. These individuals may actually live longer than others because of having a "safety valve" which creates a headache when too much stress occurs. […] A lucky one-third of mankind never has a headache of the kind that occasionally lays the rest of the world low. Excluding neuralgias and (back-of-the-head) muscle tension, one can state flatly that headaches are due to varying heart and blood volume output in relation to the local or peripheral resistance to blood flow. […] The headache does not occur during the drop in blood pressure accompanying the initial histamine shock.' (Pfeiffer 1975 p.432-3)

- 'Pain, explains Dr. Young, is "an unpleasant sensory and emotional experience, associated with actual or potential tissue damage. It is always subjective; there's no such thing as a pain meter. *[but topography]* Many things influence pain; it can be viewed as a fifth vital sign, and gives us valuable information into inner workings of the body. […] 'Doctors often tell women that they're getting old or it's all in their head… it's all in her mind […] often unwarranted psychogenic attributions for pain in women by doctors : all in your mind or head, hysterical, hypochondriac, getting old, …menstrual, …menopausal [...] that statistics show they more frequently will be labelled as hysterical, [men: "drug seekers"] […] Such reactions are evidence of a lack of individual attention, and reinforce the desirability of an integrative approach that emphasizes customized or individualized care. […] The bottom line is that women are not small men when it comes to pain, […] 'But what causes pain? What are the underlying mechanisms? It may be caused by increased central stimulation […] But pain can also be caused by decreased central inhibition," says Dr. Young; the central inhibitory pathways are modulated by chemicals like serotonin and norepinephrine [known as noradrenaline outside the US]. Looking at the picture in total, both the mind and the brain may play a powerful role in modulating ascending and descending pain signals, and can truly shape the pain experience. […] regulate the brain's natural ability to suppress pain…. endorphins or enkephalins that dampen the pain signals received by the brain.' (Morris 2005)

- Dermatomes of nerve numbness and pain (Marieb & Mallatt 2003, p.436)

- 'Vital signs are physical signs that indicate an individual is alive, such as: breathing rate, heart beat, temperature and blood pressure. These signs may be observed, measured, and monitored to assess an individual's level of physical functioning. Normal vital signs change with age, sex, weight, exercise tolerance, and condition.' (Owens 2005)

*Vital Signs as remnants of the 4 Elements:* WATER – blood pressure; AIR – breathing rate, WIND – heart beat; FIRE – temperature;… and EARTH – pain, the '5th vital sign' .

### *HTA Axis, vertical axis, brain as body integrator*

- 'The 2 principal effectors of the stress response, the hypothalamic-pituitary-adrenocortical (HPA) axis and the sympathetic nervous system (SNS), are also activated. Although normally adaptive, the stress response may become maladaptive in patients with chronic pain and fatigue syndromes, such as FM.' (Winfield 2006)

- 'Depression is characterised by an over activity of the hypothalamic-pituitary-adrenal (HPA) axis that resembles the neuro-endocrine response to stress. These HPA axis abnormalities participate in the development of depressive symptoms. Moreover, antidepressants directly regulate HPA axis function. These novel findings are reshaping our understanding of the causes and treatment of this disabling disorder. […] Why should the stress-induced activation of the HPA axis, a biological system that is life saving and enables us to fight or escape our enemy, lead to such a bad thing as depression? The answer, from an evolutionary point of view… While the exact mechanism of this effect is still unknown - and we are divided on whether cortisol is a hero or is a villain…' (Pariante 2006)

- 'According to this view [*self-organization in nonlinear systems*], the organism is conceived to consist of a number of communication subsystems integrated by the brain into a larger system of information transfer and exchange with the environment in terms of coded signals of many different categories (from ions to words).' (Weiner 1992 pp.283-4)

### *Brain cuts the pain: stress analgesia (opioid and non-opioid)*

- 'Two forms of stress analgesia have now been described.' [opioid and non-opioid] (Weiner 1992 p.5)

- '[…] Empirical advances: Until fifteen years ago stress research consisted of correlations between the stressor and the physiological and/or anatomical changes in the body. The discovery of the brain-gut peptides and other advances in neurobiology have [… given] a new impetus to stress research. (1)Two forms of stress analgesia have now been described […] (2) The function of brain peptides is to produce *patterned* physiological changes, which are exactly what an integrated view of the responses to stressful experiences demands..' (Weiner 1992 p.5)

### *Perturbable dynamics, information (perception): brain integrated 'response to stress' (external-internal)*

- 'The concept of perturbation leading to a change in function is central to and the basis of stress theory (Weiner 1989, 19991b). It… allows us to understand how the human organism with its unique genetic and experiential history responds to perturbing experiences that allow it to remain intact, or to make the voyage from health to illness and/or disease,… Rhythmic functions manifest stability but, being dynamic are perturbable.' (Weiner 1992 pp.284)

'Significant advances have recently been made in our understanding of how the organism responds in a patterned and integrated, behavioral and physiological manner to new experiences, perturbations, challenges, threats, injury or complex changes in the environment. One seeks to understand by what means the organism recognizes them, what is the meaningful signal that is perceived, and how that perception is translated and orchestrated into anticipatory and appropriate behavioral and physiological responses designed to ensure survival. But the environment is not only stressful, it is also a source information and a repository of resources.' (Weiner 1992 p.2)

'the person for diverse reasons has failed to cope with them.' (Weiner 1992 p.15)

'Nonlinear mathematical models are approximate descriptions of the dynamic functions of biological systems. It is acknowledged that a more realistic account of physiological rhythms is needed. Feedback, that in part accounts for them, is provided by information exchange within the organism and between organisms by signals of a large variety of kinds. In this way, the organism is kept

informed about its own internal state and the condition of the external environment.' (Weiner 1992 p.283)

### *Brain-immune bi-directional vertical axis: activation*

- 'Cytokines for psychologists: Implications of bidirectional immune-to-brain communication for understanding behaviour, mood and cognition.'*(* Maier & Watkins 1998)

- 'The brain and immune system form a bidirectional communication network in which the immune system operates as a diffuse sense organ, informing the brain about events in the body. This allows the activation of immune cells to produce physiological, behavioral, affective, and cognitive changes that are collectively called sickness, which function to promote recuperation. Fight-flight evolved later and coopted this immune-brain circuitry both because many of the needs of fight-flight were met by this circuitry and this cooptation allowed the immune system to respond to potential injury in anticipatory fashion. Many sequelae of exposure to stressors can be understood from this view and can take on the role of adaptive responses rather than pathological manifestations. Finally, it is argued that activation of immune-brain pathways is important for understanding diverse phenomena related to stress such as depression and suppression of specific immunity.' (Maier & Watkins 1998)

### *Micro-motions: being unconscious or sensitive*

- 'Sensitivity is the set of functions that permit to react to the stimulation of a sensory receptor (sensation). … The classification of the five senses, established in antiquity… is incomplete: it does not include the spatial sensations that give information on the position and motion of the body in space. Sensitivity plays a fundamental role in adaptation. The question of the validity of the sensory data is essential and Descartes distrusted them.' (Sensibilité, 2001, summarised translation)

- 'When the text is read with mind and consciousness well focused, when the concentration is sufficiently complete, certain phenomena will occur to assist the communication process just described [message from text to mind to brain to body]. […] The reason why these phenomena – mostly micromovements of the muscles – are unconscious is simply that they are so mall. […] the mind is to be as passive as possible, doing *nothing* voluntarily, and refraining from initiating bodily activities. Only when the mind is thus passive does the central nervous system have the best opportunity to make its own comparatively pure responses to the text [its message to the body]. ' (Masters 1994 p.3-4) […] 'Masters has also developed a series of exercises to reverse aging…. 'Whatever the brain can organize, Masters says now, the body will execute. If you learn to frame the statement, if you use the right images, you can work on heart, blood flow, lymph. The movement will happen.' (Masters 1994 p. xvi)

- 'As Dr. Ekman describes in "Emotions Revealed," to be published by Times Books in April, these microexpressions - ultrarapid facial actions, some lasting as little as one-twentieth of a second – lay bare our most naked feelings. We are not aware we are making them; they cross our faces spontaneously and involuntarily, and so reveal for those who can read them our emotion of the moment, utterly uncensored.' (Goleman 2003)

- 'Strong Prana is an asset for attaining success in spontaneous practice. Hence willful practice is very important for beginners. Pranopasana and Pranavidya are Sanskrit terms used for the spontaneous practice of Yoga, in which the vital force of Prana plays the key role. Before beginning such spontaneous practice, one should cultivate the intensifying of the vital force… The next step is the release of the vital force…. The third step is the raising of the vital force… along the path of the central subtle channel (Sushumna). The fourth step is the stabilization or conquering of the vital force in the frontal region. The fifth and final step is that of annihilation or dissolution of the Prana. Strong vital force is a must for an aspirant who intends to take up the spontaneous practice of yoga. Weak vital force cannot take one very far on the path. In order to strengthen the vital force one should… and practice willfully the Yogic exercises. When, through such willful practice the vital force is intensified, one should lift mental control over the body through the relaxation of the bodily organs and limbs. If this is done properly, the intensified vital force is released. This is Pranasfurana, in which various physical movements occur spontaneously. (Muni 1993 p.170-171)

### *Failure of brain-central-control*

- 'The disease of adaptation deals with maladies […] which we consider to result largely from failures in the stress-fighting mechanism.' (Selye 1976 p. xviii)

- 'the person for diverse reasons has failed to cope with them.' (Weiner 1992 p.15)

- 'I have included all the many names that I have found for the syndrome first named neurasthenia in April 1869, up to the most recent proposal of Chronic Neuroendocrineimmune Dysfunction Syndrome. The dates refer to the year of the earliest (and often only one) published paper I could find that defines the disease.' Among these over one hundred names are: Fibrositis, Heat, Cold and Effort Sensitiveness, 2oth century syndrome, many names for neurasthenias, myalgias, fatigues, dysautonomias, syndromes related to encephalomyelitis, allergy, battle, related to hypochondriasis, neuroses and mental illness, Idiopathic Hypogeusia., and Chronic Habitual Hyperventilation Syndrome.' (Donnay 2002) – See etymology of 'hypochondria' and 'hysteria'.

- 'Patient: Annette – She added, "I know – not wanting to mature as a female body is a child's way of looking at it. '(Czyzewski &, Suhr 1988 p.122) [ ….] Annette repeated the issue of not feeling human during the course of therapy… I told her that many other patient's expressed the same fear. Annette … [said] "It is sort of a given that if you don't see yourself or your body as everybody else considers them to be, then you are not really human".' (op. cit. p. 128) 'Patient: Ita – How come that a girl growing up under such favourable circumstances fails to develop a sense of meaningful self-value. '(op. cit. p. 130) ' Patient: Fawn – Fawn's attitude about her eating habits was partly mystical.' (op. cit. p. 139)

- ' Anorexics misuse the eating function in their effort to solve problems in various areas of living. (op. dit. p. 115) […]they suffer from a perceptual flaw in that they are frequently unable to differentiate between hunger and other sensations and feeling states: the brain is continuously making mistakes in its efforts to discriminate between bodily and psychological needs […] they may claim that they were introduced to this uncontrolled overstuffing with food by others and may hold these people responsible for the habit..' (op. cit. p. 115)

- 'If you fall asleep after meals, talk to your doctor' [TV message]

- 'The exact cause of narcolepsy is unknown. Studies using gene markers have indicated that the disorder may be genetic. A small group of neurones in the brain has been implicated in producing transitions from sleep to wakefulness and vice-versa. People with narcolepsy may have fewer of these neurons or they may have been damaged. The condition may be aggravated by conditions that cause insomnia, such as disruption of work schedules. Narcolepsy is characterized by episodes of frequent, uncontrollable daytime sleeping, usually preceded by drowsiness. The episodes usually occur after meals, but sudden onset of sleep may occur while working or driving a vehicle, having a conversation, or being in any sedentary or nonstimulating situation. There is a brief period of sleep, and the person awakens feeling refreshed. However, the person may again become uncontrollably sleepy a short time later.' (Campellone 2004)

- 'E. Bleuler notes that the child is not a little schizophrenic but a normally functioning though primitive being. "The schizophrenic will regress to, but not integrate at , a lower level; he will remain disorganized" (Arieti, 1959, p. 475). Regression is essentially disintegration of personality; that is *dedifferentiation* and *decentralization*. […] Decentralization is, in the extreme, functional dysencephalization in the schizophrenic.' (Von Bertalanffy 1968 p.214)

### *Self-control of health, brain-central-control: Alert voluntary attention*

- ''Rather than signaling [sic] pleasure as previously thought, the neurotransmitter dopamine may be released by brain neurons [sic] to highlight significant stimuli… Satisfaction triggers the release from cells deep inside the brain of chemical dopamine – a neurotransmitter supposed to act on the brains reward system to produce feelings of pleasure.. but many researchers no longer believe it acts directly, producing feelings of pleasure or euphoria. Instead, new data indicate that dopamine release within the brain highlights, or draws attention to certain significant or surprising events… but also… simply startling…. These researchers say the dopamine signal helps the animal to learn to recognize them and in some cases to repeat them.' (Wickelgren 1997)

- The secret of transformation from illness to health to higher levels of performance and well-being lay in recognizing and facilitating a person's own creative resources during these natural windows of inner focus and rejuvenation that arise periodically for about 20 minutes every hour and a half or so throughout the day (Rossi 1982 p.130). […] Igor Todorov (1990) has integrated research on the molecular genetic cellular-level that outlines the more general process of complex adaptation to physical trauma, shock and stress.' (Rossi 1996 p.144)

- 'The senior author has outlined research supporting *The Neuropeptide Hypothesis of Consciousness and Catharsis* that accounts for the arousal and relaxation phases of cathartic psychotherapy by the time-linked release of ACTH and… mental experience can modulate body processes and vice versa, in cybernetic patterns of information transduction. Mind over body and body over mind.' (Rossi 1996 p.308-9)

- 'Release of a rigidly apprehended focus of attention is associated with higher amplitude of EEG activity, as exemplified by alpha waves, and by greater phase agreement or synchrony between the activity occurring at all lobes.' (Fehmi & Fritz 1980 p.25) 'An attentional perspective suggests that the "automatic" triggering of the "fight or flight" response actually presumes the attentional mode of narrow focus-separateness. […] Stressful life events take their toll in accumulated tension… precisely because they elicit narrow focused [sic], obsessive or denying modes of attending.' (Fehmi & Fritz 1980 p.27) […] Open Focus may be seen as an altered state of awareness in which denial processes are dropped, thus promoting alert tranquility, physiological normalization and optimization of performance.' (Fehmi & Fritz 1980 p.28)

### *Brain & mind – Immunity as psycho-neuro-endocrino-immunology*

- "Primarily considered a modulator of blood pressure and water balance, vasopressin is also involved in anxiety-like behaviours, especially in animals exposed to repetitive stressors… and there is also evidence that people with depression demonstrate increased levels of vasopressin.' (Spollen et al. 2002)

- There are two physiological conditions that may be related to unusual cognitive abilities. One is associated with the hypersensitivity that may bring on asthma and allergies, the other with vasopressin, the hormone whose most familiar effect is water-retention in body tissue.' (ASPR 2005)

- 'It is difficult to doubt that immunity and a person' psyche are interrelated, but what is difficult to explain is the causal relationship. What is really causing what? Some argue that stress causes depression, which causes the immune system to function improperly because resources are tied up in activating the fight or flight mechanism. Others argue that depression causes stress, which then causes fight or flight. And yet another group argues that a person's psychological state causes the individual to indirectly affect their health by bad nutritional, physical and sleep patterns. Future studies need to address these issues.' (Beaton 2003)

- ' I recited the words……and I can only surmise that it acted through…….a form of emotional resonance that happens when receptors are vibrating together in seemingly separate systems. This was before the term *subtle energy* had been introduced to describe a still mysterious fifth source…….and scientifically explain anomalies. (Pert 1997 p.252)

- 'Progesterone [can, says Pert's doctor,] protect against the symptoms of menopause: hot flashes, fibrocystic "lumpy" breasts, weight gain, and fluid retention… [It] is the "mother hormone", creating feelings of calm and nurturance (especially in pregnant and lactating women, who produce particularly high quantities of it).' (op. cit. p.255)

- 'I have postulated a biochemical link between the mind and body, a new concept of the human organism as a communication network that redefines health and disease, empowering individuals with new responsibility, more control in their lives.' ((op. cit. p.15)

- 'The concept of a network, stressing the interconnectedness… has a variety of implications…. In the popular lexicon, these kinds of connections between body and brain have long been referred to as "the power of the mind over the body." But in light of my research, this does not describe accurately

what is happening. Mind doesn't dominate body, it *becomes* body – body and mind are one. I see… the flow of information… as evidence that the body is the…actual outward manifestation, in physical space, of the mind – Bodymind… It become[s] clear how emotions can be seen as a key to the understanding of disease. […] The immune system, like the central nervous system has memory and the capacity to learn. Thus it could be said that intelligence is located not only in the brain but in cells that are distributed throughout the body.[…] The brain is extremely well integrated with the rest of your body… The information molecules travel from one system to another… of the network. [We] must see them [emotions] as cellular signals that are involved in the process of translating information into physical reality, literally transforming mind into matter. Emotions are the nexus between matter and mind, going back and forth between the two, and influencing both.' ((op. cit. p.187-189)

- '[…] In animal tissues response becomes feeble at low temperatures. As an optimum temperature it reaches its greatest amplitude, and again, beyond a maximum temperature it is very much reduced.' (Bose 1922 p.188) '[…] In certain types of tissue the stimulated is relatively positive to the less disturbed, while in others it is the reverse;…this is accomplished either (1) by 'injuring' or (2) by introducing a perfect block.' (Bose 1922 pp. 183)

- 'There is increasing scientific interest in the area of brain-immune system interactions and the physiological changes that are induced by activation of the immune system…. Stress and other behavioral and psychologic factors may be linked to disease susceptibility and progression through either direct CNS-immune system links or CNS-endocrine-immune system pathways. Cytokines and their receptors that are expressed in both the immune and central nervous systems provide a critical link between the two systems. Activation of these cytokine receptors regulates a variety of physiological events, ranging from activation of the hypothalamic-pituitary-adrenal axis to sickness behavior.' (PsychoNeuroImmunology 2006)

- 'The study of the effects of the mind on the functioning of the immune system, especially in relation to the influence of the mind on susceptibility to disease and the progression of a disease.' […] 'The field of psychoneuroimmunology (PNI)… studying the interactions among the central nervous system (CNS), the endocrine system, and the immune system. Mechanisms underlying this linkage are, now becoming understood. […] Psychoneuroimmunology increasingly is dissolving dualisms of mind-body, body-environment, and individual-population.' […] '…that somatic awareness is akin to psychological insight … The degree to which the patient is skilled at sensing the body's diseases and its health are also conditions of meaning, as integrated through interpretations of life experienced by mind-brain-immune system. […] Patients may begin to realize the extent to which the body that he or she presents to medicine for diagnosis and treatment …' (PsychoNeuroImmunology 2003)

- Searches on the whole website performed more recently returned: 'Search Keyword "mind" – Total 0 results found.', and 'Search Keyword "somatic awareness" – Total 0 results found.' {PsychoNeuroImmunology – 2006 searches)

- 'To understand these factors, collaborations between investigators from different disciplines must have an understanding for each other's fields, methods, and technologies.' […] 'This innovative journal publishes peer-reviewed basic, experimental, and clinical studies dealing with behavioral, neural, endocrine, and immune system interactions in humans and animals. […] Research areas include: Stress and immunity, including the role of stress-related hormones and neurotransmitters on the immune system and brain; Actions of cytokines and growth factors on neuronal and glial cells to regulate behavior, cognition, and neuroendocrine function; […] Inflammation, neuroscience, and behavior; […] Sleep, exercise, immunity, and health; […] Regulation of nerve injury and repair by the immune system; Psychosocial, behavioral, and neuroendocrine influences on immunity and on the development and progression of immunologically mediated disease processes; […] Cancer, brain, and immunity;' (PsychoNeuroImmunology 2005)