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Percussion circuits and brain function – A hypothesis

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ABSTRACT

It is proposed that percussion reactions take place in cells of the sensory organs and the brain. The percussion pulses produced by such reactions are the basis of the recording of information and images generated by the five sensory organs. Also proposed and described are the mechanisms by which this information and these images can be recalled for use in the present time.

Introduction

The manner in which the human brain functions has been the subject of study, debate and hypotheses for centuries [1–4]. This organ identifies, records, organises and initiates response to information concerning physical phenomena exterior to the metabolism collected by the five metabolic sensory organs. Extensive studies of the brain have resulted in the proposal that particular regions of the brain are involved in the operations of each of the sensory organs. Detectable electrical activity is generated within the brain and this phenomenon is and has been widely used in the study of brain functions [5]. The activity comprises voltage oscillation from a negative state to a positive state and the return to the negative state occurring over periods of milliseconds. The effect is known as an action potential and is taken to originate with neuron brain cells. Continuous oscillations of the membrane potential and/or rhythmic patterns of action potential are also associated with the brain. These are known as neural oscillations. The electric field associated with the voltage oscillations of the action potential supported by the activity of intracellular calcium ions is proposed as causing the release of one of a number of compounds designated as neurotransmitters at the terminal of a neuron axon [1]. The compounds transfer across a gap to the dendrite extensions of the membranes of other neurons or to the membrane surface of other cells. Receipt of a neurotransmitter is postulated to induce an action potential in the receiving neuron or other cell by chemical reaction. The reaction is taken to result in decomposition of the neurotransmitter involved. Transfer of action potentials between neurons and other cells is advanced as being involved in the transmission, receipt, recording, and recall of information acquired from the sensory organs plus the reactions to this information initiated by the brain. A second proposed mechanism fulfilling the same purpose of information transfer and involving direct ion transfer from membrane to membrane through linked channels has also been proposed [1]. Electromagnetic fields considered to be associated with the brain are also proposed a source of brain functions [6,7]. Other concepts of brain function have applied the principles of quantum mechanics and holographic recording [8,9].

The positive ion movement origin of the action potential above does not take into account neutralisation of the negative charge displayed by proteins. This would lead to structural instability and disintegration of these compounds. The movement of charged particles from cell to cell by specific channel linkages envisaged by the second mechanism above is limited by the identical nature of same cell intracellular fluids. This will have the result that such a transfer will be undirected and dependent on random ion drift. The application of electromagnetic field variations to brain function advances no proposals regarding the interaction of the different forms of energy input from the sensory organs with the postulated electromagnetic fields.

The intracellular and intercellular fluids are hydrophilic colloidal fluids stabilised by electric charge, usually negative. Changes in the charge state of these fluids arising as a result of the entry or formation of excess and/or opposite electrical charge will lead to destabilisation of such fluids giving rise to precipitates. In the work below action potential is proposed as being the result of chemical reaction in sensory organ and brain cell intracellular fluids leading to the generation of a positively charged reaction product. The latter destabilises the intracellular fluid and produces a precipitate. This is followed by dispersal of the charge through decomposition of the reaction product plus dissolving of the formed precipitate. The process is then the source of electrical activity of the brain through a change of chemical energy to electrical energy [10]. The cellular chemical reactions giving rise to these charged particles are the basis of brain functions and the charged particles are organic ions known as betaines. This proposal is extended to identify the cells involved, the nature of the specific

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charged particles related to the cells of each sensory organ and the means by which these effects lead to the functions of the brain.

The formation, nature and effects of percussion pulses

It is proposed that percussion decomposition of peroxynitrate compounds occurs in the intracellular fluids of the sensory organ and brain cells. Peroxynitrates are highly unstable and are advanced as undergoing very rapid, self-propagating decomposition (detonation decomposition) producing a charged betaine and a precipitate [11]. The reaction liberates heat and results in the development of a sudden and rapid rise in pressure of any gas produced by the reaction or any gas present in the reaction zone. The pressure effect is transmitted as a high speed percussion pulse (detonation pulse). The peroxynitrates are of varying composition and each type is unique to the cells involved. The betaine causes the precipitation of gel-like solids in the intracellular fluid of the cells involved (salting out). The amount of betaine and precipitate formed plus the composition and physical and chemical properties of the both are also unique to the cells involved. Cells of the sensory organs and brain in which the percussion compound has undergone percussion decomposition are designated "discharged" cells. These cells produce no further percussion waves until the electrical charge and the precipitate disperse and the percussion compound reforms. These processes are designated "recharging" and when complete the cells are designated "charged" cells. Percussion chemical reactions can be initiated, that is, detonated, by rapid application of energy in the form of pressure (shock), rapid rise in temperature, receipt of light and sound, or application of electrical pulse. From this percussion reactions in the cells of the eyes are initiated by absorption of visible radiation and in the ears by increased and variable air pressure. Cells of the tongue and nose give rise to percussion pulses through change in temperature produced by chemical reactions. Touch is activated by applied pressure.

The concentration of the particular percussion compound in each cell is taken as having varying values up to a maximum value. The amount of a charged betaine formed is dependent on the characteristics of the percussion compound and the concentration (grams per millilitre) present in the cell. The precipitates formed are proposed as being composed principally of proteins in which any charge has been annulled and which, during precipitation, act as carriers resulting in the physical removal of other compounds from the intracellular fluid. This is considered to be particularly the case in the chemical reactions which initiate percussion reactions in cells of the the nose and tongue. At the point of initiation the percussion pulse and thermal effects are transmitted in all directions within the cell volume in which generation occurs. The various characteristics of a typical percussion pulse are shown in Fig. 1 and comprise the rate of rise of the initial pulse, as measured by the angle alpha (a), height of initial pulse and pulse length. The rise of pressure occurs over intervals of microseconds and the percussion pulse decays to zero value over a particular time interval, usually milliseconds [12]. A specific minimum amount of energy is required to initiate the percussion chemical reaction. The latter varies according to the reaction involved and has a different value for every percussion reaction. The value of pulse height and pulse length is dependent on the concentration of percussion compound in the cell and the pulse from a given percussion reaction has the same overall form. The entire amount of percussion compound in a cell is decomposed on initiation of the percussion decomposition. The amount varies in cells undergoing recharging according to the time elapsed since discharge. The rate of rise of the percussion pressure pulse is a measure of the rate energy is absorbed by the percussion compound. This is dependent on the physical and chemical properties of the percussion compound. The combination of different minimum activation energies, different pulse heights and lengths means that the overall form of the pulse is unique to the percussion compound and the cells involved. From this the percussion compound in eye cells will not be induced to undergo decomposition by percussion pulses from the ear cells or other sensory organ and brain cells. Percussion pulses travel through biological materials and have been used in biological applications and studied in fluids [13,14]. The characteristics of percussion pulses initiated by one cell type induce decomposition of the same percussion compound in other cells situated remote from the originating cells. The properties of percussion pulses include a very high speed of transmission, for example to 2000 metres per second and variations of speed of transmission. The speed of transmission and the extent of transmission through a given material are linked to the properties of the material involved, for example tissue density. Percussion pulses are subject to both constructive and destructive interference resulting in pulse enhancement, pulse diminution or pulse annulment respectively.

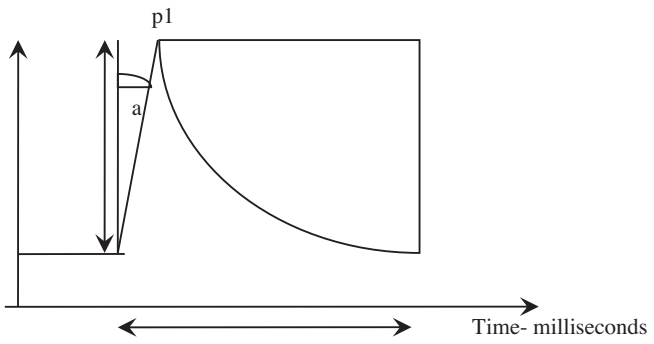

Fig. 1. The characteristics of a percussion wave.

It is established that the cells of eyes and tongue respond to subdivisions in the characteristics of external physical phenomena involved. For light the subdivisions comprise blue, green and red light and for the taste cells subdivisions are umami, sweet, bitter, sour and salt. In the case of light each of the subdivisions represent radiation with different energies. Low intensity blue light carries more energy than low intensity red light. Under conditions where the low intensity of blue light discharges vision sensory cells low intensity red light may not initiate the percussion reaction. At high intensities blue and red light are distinguished by the former resulting in an increased number of the cells involved being discharged. The subdivisions of taste are recorded through variations in the concentration and type of the compounds involved in the relevant chemical reactions.

Betaines which can form in sensory organ and brain cells are tryptophan betaine, phosphagen betaine, kynurenine betaine, histidine betaine (hercynine) plus glycine betaine. Each betaine is peculiar to a sense organ or brain cell. Tryptophan betaine is identified with the vision sensory organ cells on the grounds that this compound exhibits luminescent characteristics [15]. Phosphagen betaine is identified with the brain cells linked to muscle cells on the grounds that this compound is present in muscles and the brain [16]. The same compound is also identified with the sense of touch. The association of histamine with the lungs indicates that histamine betaine is the betaine of the cells of scent sense organ [17]. Kynurenine betaine is considered to be associated with hearing sensory organ and glycine betaine with the taste sensory organ. The chemical reactions in the brain producing tryptophan betaine from pernitrate are shown in Fig. 2. The reactions depicted are variations of reactions previously described [10]. Betaines are decomposed by hydration producing trimethylamine and an acid. For example glycine betaine (CH3)3N-O-CH2CO gives rise to